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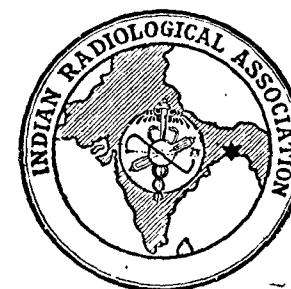
NOVEMBER, 1960

THE Indian Journal of Radiology

The Official Journal of the Indian Radiological Association

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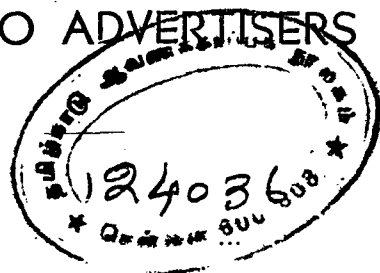
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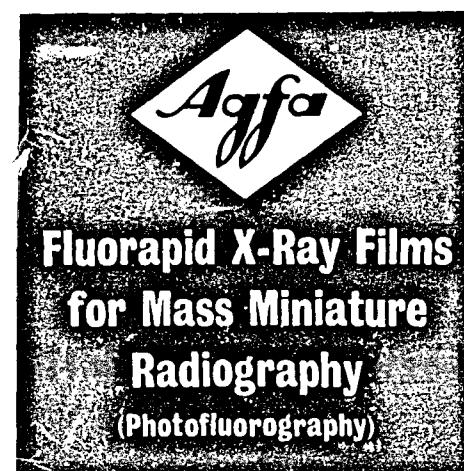
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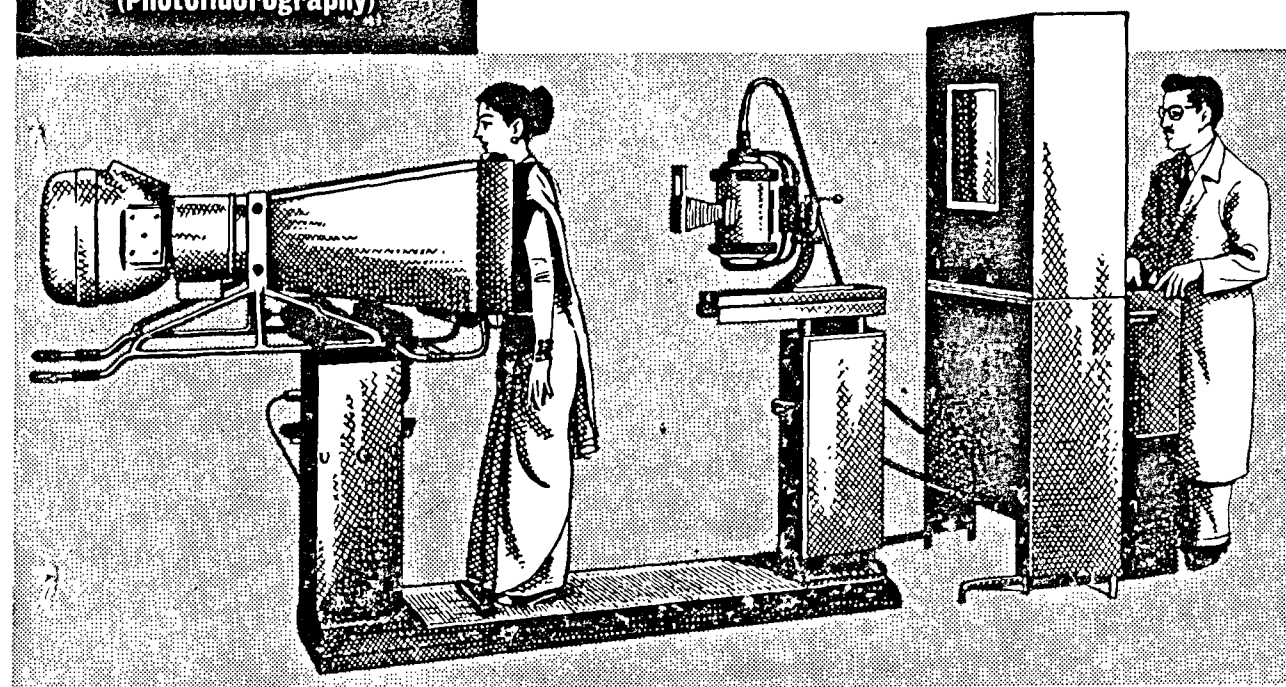
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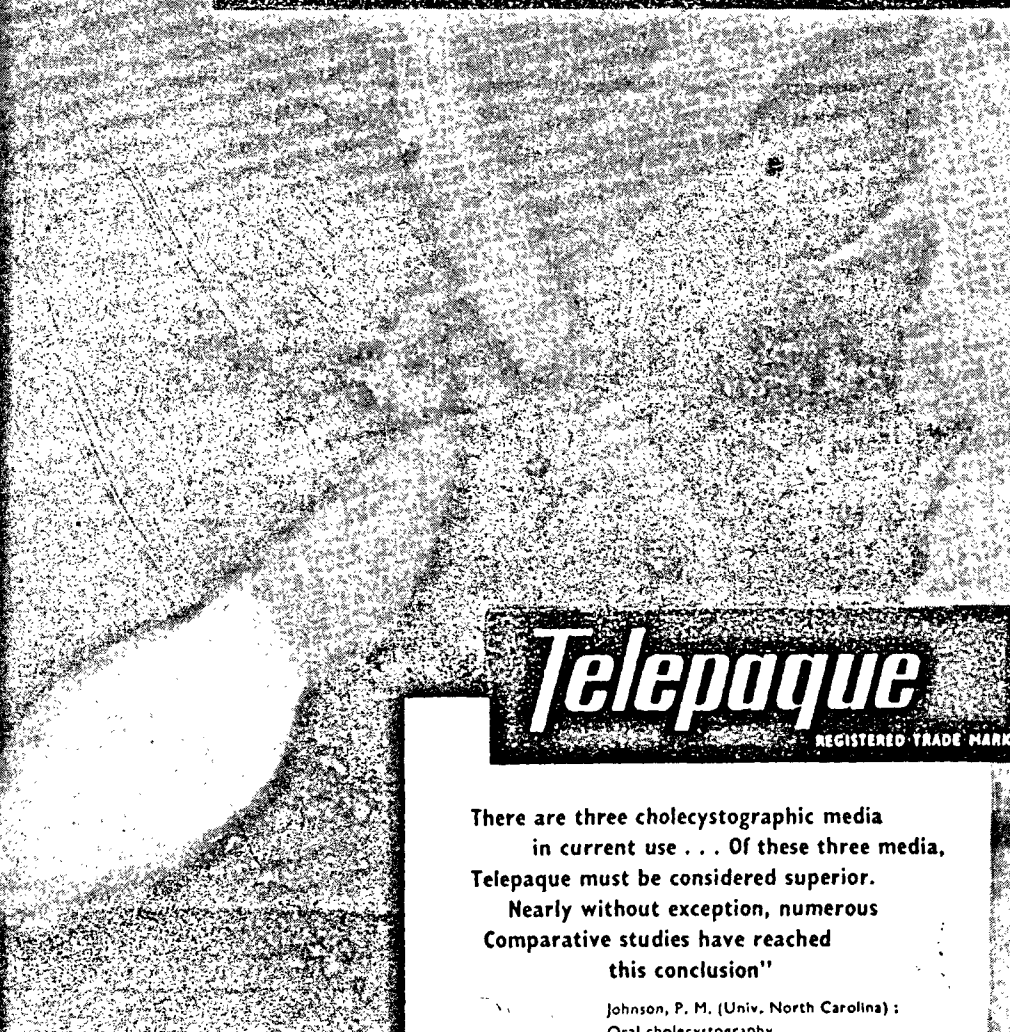
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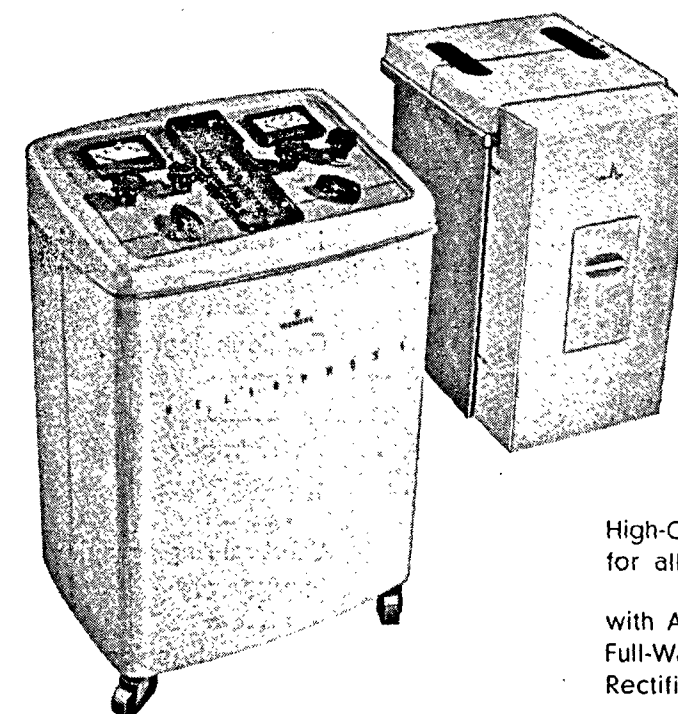
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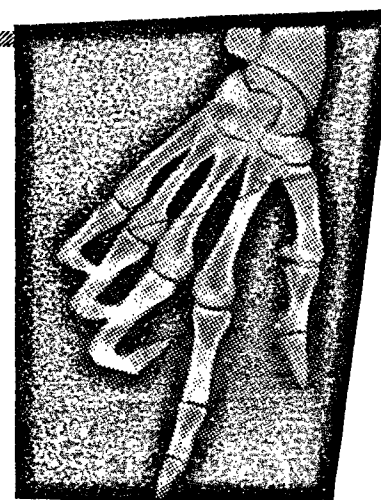
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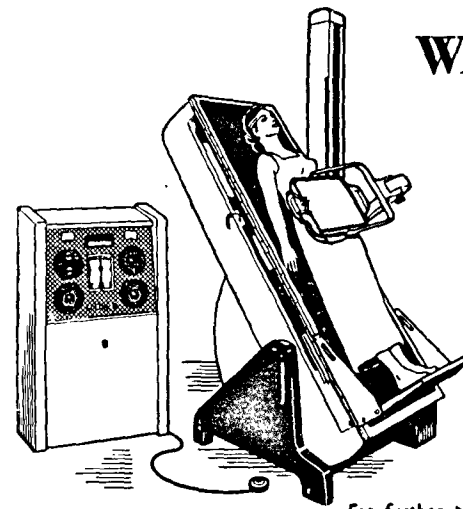
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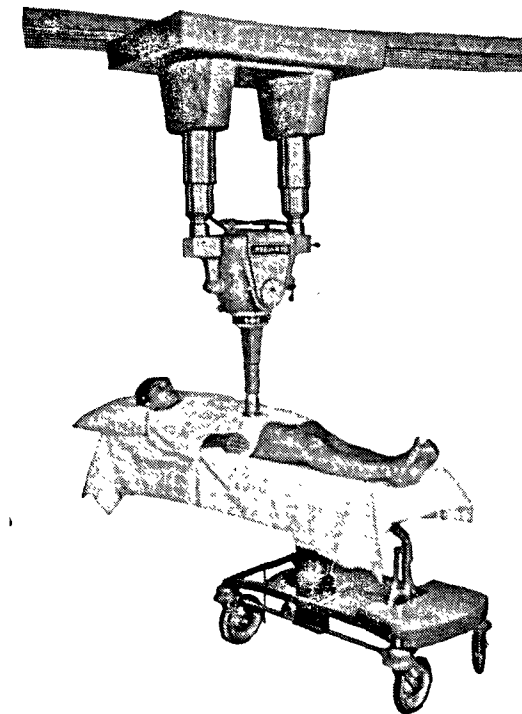
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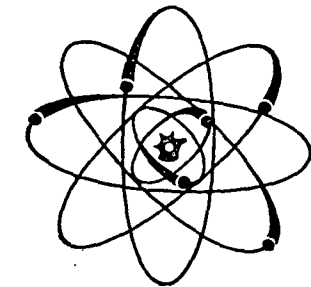
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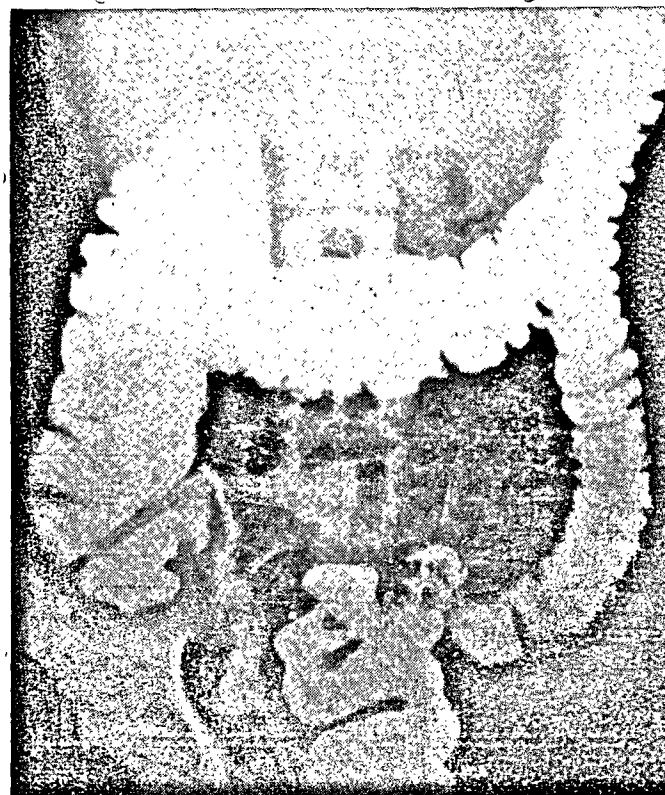
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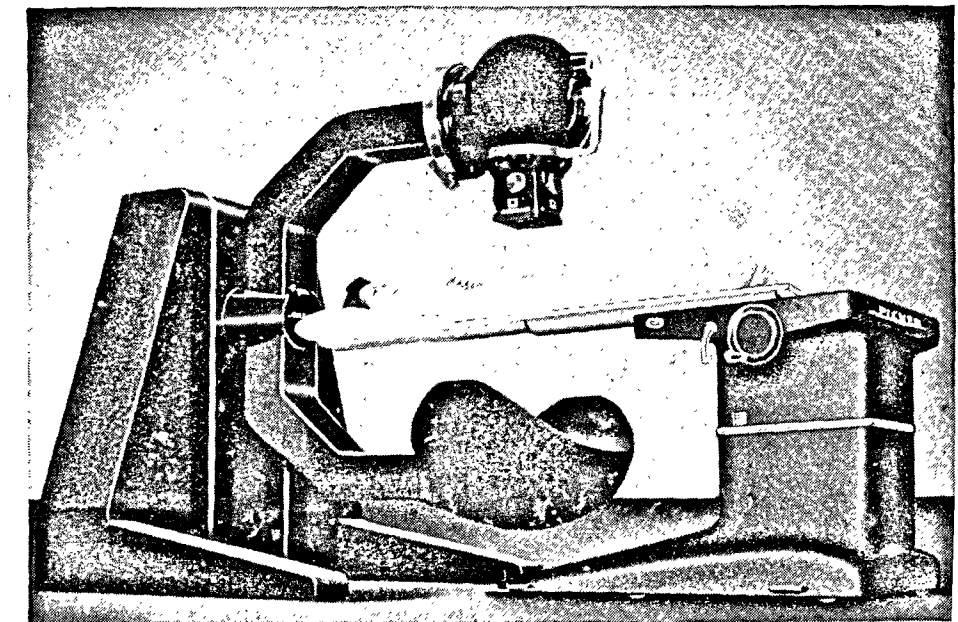
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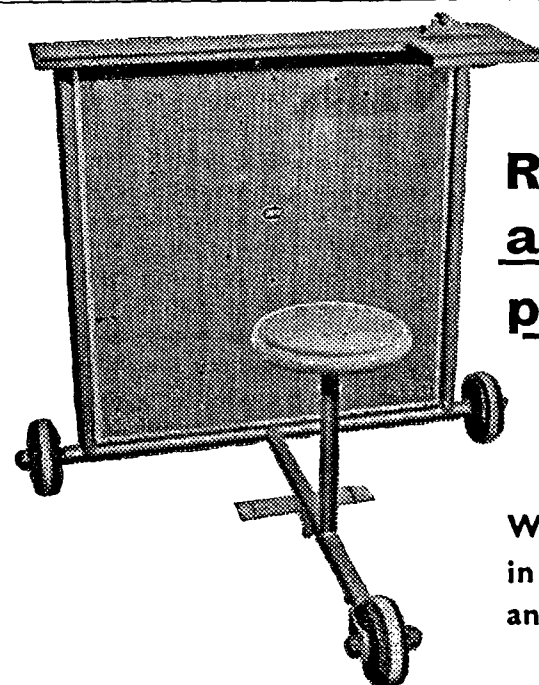
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Editorial

THE EXPANDING SCOPE OF ROENTGEN DIAGNOSIS

Scientific achievement is commonly cyclic, passing through various levels of achievement and quiescence. A decade ago, there was a considerable body of opinion which held that research in the field of roentgen diagnosis had little chance of productive achievement since it appeared that the potential of the method had been largely achieved. And it is true that the era of description of findings, collection of data, analysis of the changes, with, finally, the logically derived diagnosis, may have approached its peak. Despite such pessimistic predictions, the scope of roentgen diagnosis is continually being extended so that in this past decade a vast expansion of diagnostic procedures has occurred.

It is notable that many of the newer achievements in roentgen diagnosis have been related to cardiovascular diagnosis. Although the basis for such work was laid down many years before, advances in techniques, improvements in the nature of the contrast media, and, above all, the greater demands of the surgeons who have developed such spectacular procedures for the relief of many cardiac and vascular diseases have stimulated roentgenologists to greater efforts. The degree of success is attested by the remarkably detailed studies of the heart and its own blood vessels; of the brain, and of the urinary tract which are now possible. The details of cerebral pathology, of cerebro-vascular diseases which can be delineated in the roentgenogram are far greater than was possible years ago. In the same way, it is now possible to opacify the coronary arteries and thus determine the exact location of an occlusion. It is unnecessary to dilate upon the extraordinary accuracy of diagnosis which contrast examination of the heart permits.

In the urinary tract, our ability to see clearly the details of the arteries has had a profound influence upon the diagnosis of hypertension as well as of other renal lesions. Similarly, the delineation of the vascular architecture of the liver and spleen, of bone tumors, as well as of other organs, represents a great expansion in the scope of roentgen diagnosis.

Lymphangiography and lymphadenography, although not yet fully developed as practical methods, are already in use and their importance can easily be imagined. It will not be long before we will be able to determine the nature of the lymphatic drainage from various tumors by roentgen, rather than surgical dissection.

The roentgen approach to the diagnosis of diseases of the liver has been explored in many directions and there has been a remarkable expansion here as well. The ideal contrast medium is not yet available, but the various methods such as splenoportography, catheterization of the hepatic artery, and of the portal vein have given us splendid diagnostic tools.

The pancreas still defies our efforts to make it radio-opaque; there is here a crying need for more research. The present crude methods for the diagnosis of pancreatic diseases need to be improved by a more detailed visualization of the inner structure of the pancreas. It is possible, of course, at surgery to catheterize the pancreatic duct and thus to inject it with contrast, but this is not a good solution.

We need also a good method for the contrast visualization of the bronchial arteries, as good as that now possible for the pulmonary blood vessels. An effective demonstration of the bronchial vessels might make it possible to determine the neoplastic or inflammatory nature of the spheroidal nodules so commonly found in the lung during the course of routine examination. A striking improvement in the differential diagnosis of pulmonary lesions might also result.

The use of radioisotopes for diagnosis as presently practiced in the study of the circulation, of the heart, the liver, and for the distinction of benign from malignant lesions of the esophagus and stomach represents a chapter in itself. Such procedures have a great potential which is only now being fully explored.

The most important change in the scope of roentgen study is its expansion into the field of physiology. Beginning as an anatomical discipline, expanding rapidly and completely into the realms of pathology and clinical diagnosis, roentgen studies only skirted the borders of physiology until the

past decade. The improvement in technique and the increase in our knowledge of the pathological physiology of disease have opened up a great vista of opportunity. Already considerable investigation into the physiology of the circulation, the respiratory tract and of the gastrointestinal tract has been carried out. The use of roentgen methods to increase our knowledge of the mechanisms of disease is still a relatively unexplored field and presents a great opportunity for productive research.

The Indian Journal of Radiology is entering into a new era of great expansion in roentgen diagnosis, especially in physiology. With its great tradition of solid accomplishment in the past, the Journal has a great potential in the future. May it continue to expand and contribute to the continued elevation of the standards of Medicine in India.

Leo G. Rigler, M.D.



LEO G. RIGLER, M.D.,

*Professor of Radiology—Cedars of Lebanon Hospital,
Los Angeles 29, California.*

Professor Leo G. Rigler, one of the outstanding Radio-diagnosticians of our times, needs no introduction to the World of Medicine, much less to our speciality of Radiology, especially in India. His ready compliance of writing the main editorial comments in this issue of our Journal, has a gesture of goodwill towards Indian Radiology. This great Internationalist considered it as the duty of the Radiologists of advanced countries like U.S.A. to do everything they can to raise the standard of Radiology and allied Sciences in friendly nations like India. Ever since he visited our country as a member of the Expert Medical Team under the auspices of the World Health Organisation in 1954 and spent two valuable months in Madras and Bombay in lecturing, demonstrating, educating and guiding our medical practitioners, specialists and students, he had been the idol of our profession. His visit raised the status of Radiology and Radiologists in India and opened the eyes of our fellow medical brethren as to the immense contributions which Radiology is making in the diagnosis and treatment of diseases. There had been occasion to observe, at very close quarters, this genius in action, in his home University of Minnesota at Minneapolis. Although his contributions to Medicine and Radiology are legion, he will be the best remembered by his students for his extraordinary ability and tireless enthusiasm for teaching Radio-diagnosis in the most lucid way. As a matter of fact more than a dozen of his former students or assistants occupy professorial chairs in U.S.A. and abroad.

It will not be out of place if some aspects of the career and the *status-quo* of this great personality in the United States of America are mentioned here. Prof. Rigler is a master of both written and spoken word. His regime as the Chairman of the Roentgen department of the University of Minnesota has been described as the golden age of Pericles. He created a model department in his University which the authorities honoured him by establishing Rigler Memorial Lecture which will be delivered by an outstanding Radio-diagnostician every year. He was the first President of Minnesota Radiological Society; President of Minnesota Pathological Society; Chancellor of the American College of Radiology; Chairman of the Section of Radiology of the American Medical Association; Trustee of the Registry of American Radiology Technicians and President of the Radiological Society of North America. He is a Fellow of the American College of Radiology; American College of Chest Physicians and Honorary

Member of nine foreign Radiological and Chest Societies. He is the associate Editor of "Radiology" and associate Editor of "The Diseases of the Chest" and is in the Editorial Board of "Surgery & General Practice". He is the author of three books in Radiology and is the author or co-author of nearly two hundred original papers. He is the Examiner of the American Board of Radiology for many years and is at present Chairman of the Board of part-graduate medical studies of the Cedars of Lebanon Hospital and Medical School, Los Angeles, and visiting Professor of Radiology, California University, besides a member of most of the national Radiological Committees appointed by the Government of U.S.A. in Washington. In spite of his multifarious activities, he was a patron of the Indo-American Society in Minneapolis and had always a soft corner in his heart for Indian Radiologists. He was awarded the Cruickshank Memorial Gold Medal by the British Constituent of Radiology and delivered a course of lectures in Radiology in Stockholm in 1958.

It will be a welcome news to all our readers that Professor Leo G. Rigler and his wife are visiting our country for the second time in May 1961, and we will have the pleasure once again to hear his illuminating lectures and discussions and the Indian Radiologists will certainly be greatly benefited by the expected visit of this great savant of Radiology. We assure Professor Rigler and his gracious partner of a very warm welcome in India and will do everything possible to make their stay pleasant and fruitful.

A. N. K. Menon.



CHARLES M. NICE, Jr.,

A.B., M.D., M.S., Ph.D., F.A.C.R., F.A.C.C.P.

*From the Department of Radiology, Tulane University School of Medicine and the
Department of Diagnostic Radiology, Charity Hospital of Louisiana,
New Orleans, Louisiana, U.S.A.*

A Simple Experiment in Small Bowel Motility

BY

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There are several disturbing features in the usual roentgenologic examination of the small intestine. Often it requires three to six hours for the barium to reach the cecum. On the usual roentgenograms taken at intervals during the examination there may be "skip" areas not well filled with barium so that areas of segmentation of barium or the appearance of slight constriction may lead to false diagnostic conclusions.

It seemed desirable to develop a method of outlining the small intestine in a uniform manner and to decrease the time needed for the examination if this could be done without sacrificing any accuracy in diagnosis.

In attempting the examination with six ounces or less of barium suspension it was noted that there was a tendency to show segmentation of the barium column and frequently four to six hours was required for the study. Therefore it seemed reasonable that increasing the volume of the contrast meal might be of value.

During routine fluoroscopy of the stomach it was noted that when the patient was in the right lateral recumbent position the stomach emptied at a rapid uniform rate. Therefore, it seemed that this position might be used in producing a more rapid and uniform filling of the small intestine.

It has been suggested that suspension of the barium meal in cold normal saline followed by the ingestion of ten ounces of cold saline will decrease the time needed for

roentgen examination of the small intestine.⁴ The use of colloidal or non-flocculating forms of barium has been advised to give a more uniform pattern in the roentgenogram.¹ The small bowel enema is said to give a rapid uniform filling.^{2, 3}

Preliminary Investigation

In the Spring of 1959 the Department of Physiology requested that the Freshman class be divided into small groups of 5-12 students each to observe fluoroscopy of the upper gastrointestinal tract. These students were asked to report to the Department of Radiology with the only preparation required being that of ingesting nothing by mouth during the preceding six hours.

A total of 106 students were divided into 12 groups of 5-12 students. Each student was questioned to exclude gastrointestinal symptoms, each was given a barium meal and each had a supine roentgenogram of the abdomen one hour after ingesting the barium.

Some of the groups were asked to remain upright and some were asked to assume the right lateral recumbent position. Almost all were given ten ounces of barium initially. To some the usual barium suspension in water was given; others were given barium in saline, barium suspended in two per cent sodium carboxymethylcellulose and others were given colloidal barium. Some groups were given an additional ten ounces of water or saline fifteen and thirty minutes

later or were given an additional five ounces of the same barium suspension at the fifteen-minute interval followed by a similar amount of contrast substance or ten ounces of water at the thirty-minute interval.

From this preliminary study it was found that if sufficient volume of contrast meal is used and if the subject assumes the right lateral recumbent position there was a uniform rapid rate of gastric emptying and small intestinal filling. The use of saline did not significantly affect the number of subjects in which the barium reached the cecum in one hour and the use of colloidal suspensions did not significantly improve the small bowel pattern on the roentgenograms when compared to those subjects who took the usual barium suspension in water and who assumed the right lateral recumbent position.

In reviewing the roentgenograms another factor of importance was noted. There was a variable amount of feces in the cecum and the presence of feces slowed motility. Thus, regardless of whether the subject assumed the right lateral recumbent position or was given additional quantities of the barium suspension, water or saline, if feces were noted in the cecum the barium was not usually seen to reach the cecum one hour after ingestion.

Since the assumption of the right lateral recumbent position, the amount of gastric residue and the presence of feces in the cecum seemed to be important factors the data in Table I were tabulated. The gastric residue was indicated by (-) if none or up to 10 per cent of the barium was noted in the stomach, one plus (+) if approximately 25 per cent and two plus (++) if 40-50 per cent remained in the stomach one hour after ingestion.

An examination of the data in Table I shows that the barium column reached the transverse and descending colon in a higher percentage of subjects who assumed the right lateral recumbent position. Further, if the number of subjects with feces in the cecum is added to the number reaching the colon it will be nearly equal to the total number of subjects in the two major groups.

The Planned Experiment

In the Spring of 1960 the Department of Physiology again requested that the students in the Freshman class be allowed to see a demonstration of roentgenologic examination of the upper gastrointestinal tract. With the previous experience in mind, the students were asked to take two ounces of castor oil on the night before or early in the morning on the day of examination and to

TABLE I

Effect of Position of Subject and Feces in Cecum on Motility.

GROUP	No. of Subjects	Gastric Residue			Barium Column Attained				Feces in Cecum
		-	+	++	Terminal ileum	Cecum	Transverse Colon	Desc. Colon	
All Groups on R. Side ...	67	51	14	2	48	24	19	11	37
Groups not on R. Side ...	39	13	16	10	39	16	10	1	26

take nothing by mouth for six hours before reporting to the Radiology Department. It was then planned to give each student ten ounces of the usual barium suspension at 2 or 3 p.m. A total of 104 subjects were examined in six groups on three successive days. It was further planned that four methods of examination would be followed with each subject to have a single supine roentgenogram of the abdomen one hour after ingestion of the barium. Gonad shields of lead rubber were used.

The four methods of examination were planned as follows:

Group I: Ten ounces of barium suspension by mouth; subjects to remain upright.

Group II: Ten ounces of barium followed by ten ounces of plain tap water thirty minutes later; subjects to remain upright.

Group III: Ten ounces of barium; subjects to assume right lateral recumbent position.

Group IV: Ten ounces of barium followed by ten ounces of plain tap water thirty minutes later; subjects to assume right lateral recumbent position.

It was found that some of the subjects took less than the recommended dosage of castor oil, some taking 0.5, 1.0 or 1.5 ounces. Only 66 took the full two ounces, 7 took 1.5 ounces, 10 took 1.0 ounce and 4 took 0.5 ounce. Eleven subjects took no laxative and six took various laxatives such as milk of magnesia, mineral oil, or phosphate of soda. Further, the results differed with various doses of the various laxatives. Some had relatively few bowel movements following two ounces of castor oil while others had a definite catharsis with smaller doses.

Review of the roentgenograms later revealed that only 52 of 104 subjects had an empty colon.

A fifth group with two subdivisions was formed with those in Subgroup V (a) having taken no laxative and those in V (b) who had taken various cathartics. Some of these subjects were given water thirty minutes after ingesting the barium and some assumed the right lateral recumbent position. Although these subjects are included in the tabulated data it is readily seen that they could alter the significance of the data.

The data obtained from the study of these 104 normal subjects is summarized in Table II. The data was further analyzed to attempt to determine differences possibly produced by the laxative taken, ingestion of water, assuming the right lateral recumbent position, and possible effects associated with amount of gastric residue and feces in the cecum. These data are tabulated in Table III.

Various combinations of the above factors were tabulated to see whether an optimum method of examination could be formulated. It was found that if conditions were such that the subject had no gastric residue and no feces in the cecum conditions were favorable for a rapid motility. In 19 of 22 subjects with this combination of factors the barium reached the cecum in one hour. The ingestion of additional water 30 minutes after the barium seems to be of slight additional value and the assumption of the right lateral position was followed by a more uniform rate of small bowel filling. When all four of these factors obtained nine out of ten subjects showed a uniform filling of the small intestine and the heads of the barium column reached various parts of the colon.

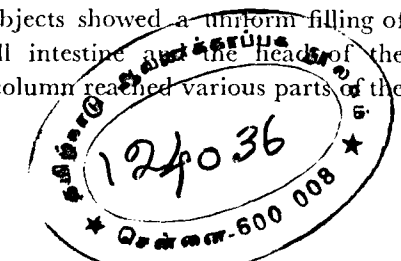


TABLE II
Summary of data on 104 Normal Small Bowel Examinations.

Group No.	Prep.	Amt. of Barium	On R. Side	10 oz. Water 30 min. later	1 hr. Gast. Res.			In 1 hour Barium Reached				Feces in Cecum	Remarks
					—	+	++	Mid. Ileum	Term. Ileum	Asc. Colon	Trans. Colon	Desc. Colon	
I	2-0 of C. O.	10 oz.	—	—	3	4	9	8	3	2	2	1	7
	1-5 of C. O.	10 "	—	—	—	2	—	—	1	—	—	1	0
	0-5 of C. O.	10 "	—	—	—	1	1	1	—	—	—	—	3
II	2-0 of C. O.	10 "	—	14	3	7	4	4	5	2	3	—	4
	1-5 of C. O.	10 "	—	2	—	—	2	1	—	1	—	—	2
	0-5 of C. O.	10 "	—	2	1	—	1	—	2	1	—	1	3
III	2-0 of C. O.	10 "	19	—	11	5	3	4	6	4	3	2	6
	1-5 of C. O.	10 "	1	—	1	—	—	—	1	—	—	—	1
	0-5 of C. O.	10 "	1	—	—	1	—	—	—	—	—	—	1
IV	2-0 of C. O.	10 "	17	17	10	7	0	2	3	4	4	—	6
	1-5 of C. O.	10 "	2	2	—	1	1	1	—	1	—	—	0
	0-5 of C. O.	10 "	3	3	2	1	—	—	1	—	2	—	1
V(a)	None	10 "	4	5	6	2	3	5	2	2	2	—	9
V(b)	Various	10 "	2	2	1	3	2	2	1	1	—	2	6
Totals	104	—	50	51	38	35	30	31	27	19	16	11	52

*One took only 5 oz. barium.

TABLE III
Possible Effects Associated with Various Factors in the Experiment.

FACTOR		No. of Subjects	No. in which barium reached colon in 1 hour
Laxative	... 2 oz. C. O.	66	31
"	... Other	38	15
Additional Water	... Yes	51	28
"	... No	53	18
R. Side	... Yes	50	26
"	... No	54	20
Gastric Residue	... —	38	22
"	... +	36	15
"	... ++	30	9
Feces in Cecum	... —	52	35
"	... +	33	7
"	... ++	19	4

TABLE IV
Summary of Cases in which barium reached transverse or descending colon in one hour.

GROUPS	No. of Subjects	No. reaching T. or D. colon	No. on R. side	Additional Water	No. with no gastric residue	No. with no feces in cecum
I	22	4	—	—	1	4
II	21	4	—	4	2	4
III	21	5	5	—	4	5
IV	23	10	10	10	8	10
V(a)	11	2	—	2	1	1
V(b)	6	2	1	1	1	1
Totals ...	104	27	16	17	17	25

Perhaps an analysis of those subjects whose barium columns reached the transverse or descending colon in one hour will help to show the value of the above factors in a more striking manner. These data are shown in Table IV. This table emphasizes the value of a clean colon when rapid small intestinal motility is desired.

Discussion

While one should not sacrifice accuracy for speed it is also true that slowness alone is not a virtue. The optimum desired is to expedite an examination while maintaining maximum accuracy. Many times it has been noted that when a small quantity of barium has been given or the patient has remained

supine or upright there is an intermittent filling of various parts of the small bowel and many hours are consumed in the examination (Fig. 1). On the other hand when the colon has been cleansed, adequate volume of meal given and the patient assumes the right lateral recumbent position the examination is moderately rapid and a

uniform filling is obtained (Fig. 2). Further, the quality of the pattern is such that no special preparations are required. In some patients with feces in the colon it is still possible to fill the small bowel rapidly (Fig. 3) but usually these patients have a longer transit time.



Fig. 1

Roentgenogram taken 60 minutes after ingesting 5 oz. of barium, patient lying on right side.



Fig. 2

Colon prepared by giving 2 enemas night before examination.
Patient also had cholecystogram.
(a) 30 minutes.



Fig. 2

Colon prepared by giving 2 enemas night before examination.
Patient also had cholecystogram.

(b) Oblique view at 45 minutes.



Fig. 2

Colon prepared by giving 2 enemas night before examination.
Patient also had cholecystogram.

(c) 60 minutes.

Water given after 40 minute roentgenogram.



Fig. 3

Patient who received no laxatives or enemas but who was placed in right lateral recumbent position.

(a) 20 minutes after injection of barium.



Fig. 3

Patient who received no laxatives or enemas but who was placed in right lateral recumbent position.

(b) 40 minutes



Fig. 3

Patient who received no laxatives or enemas but who was placed in right lateral recumbent position.

(c) 60 minutes.

10 oz. water given after 40 minute film.

With the above in mind the following regimen is suggested for the roentgenologic examination of the small intestine.

1. Preparation: empty colon with laxatives, enemas, or any combination desired. Nothing taken by mouth after laxative.

2. Ten ounces of usual barium suspension given by mouth during fluoroscopy of esophagus, stomach, and duodenum. Roentgenograms as indicated.

3. Patient to assume right lateral recumbent position.

4. Twenty minutes later: roentgenogram in supine position to show upper small intestinal loops.

5. Thirty minutes later: fluoroscopy to visualize, palpate, and separate loops; ten ounces of water by mouth.

6. Forty minutes later: prone film of abdomen.

7. Sixty minutes later: fluoroscope to see whether barium has reached the cecum. If it has not, give more water and have patient assume right lateral recumbent position for a few minutes longer. When fluoroscopy reveals barium in the cecum spot films of the terminal ileum and ileocecal valve region with compression to enhance demonstration. Another prone film of the abdomen is taken at this time.

This method of examination has been used at Charity Hospital in New Orleans

for the past year. The resident and staff radiologists have uniformly reported enthusiasm for the method. The radiologists at the U. S. Public Health Service Hospital have also used the method with good results. One radiologist in a private office has used the method and states that it saves time and film.

From an objective view-point it is realized that this method will have to be used for some time to see whether there is a significant increase or decrease in the accuracy of detection of lesions. Up to this time the impression is gained that one is more likely to see small filling defects in the barium column; certainly one is able to evaluate such findings as segmentation and partial constrictions more easily than with most methods.

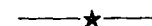
Summary and Conclusions

The type and volume of barium preparation, position of the patient and state of evacuation of the colon have been studied relative to the rate of motility and quality of roentgenographic pattern of the small intestine.

When (1) the colon is empty, (2) adequate volume of the usual barium suspension is given by mouth and (3) the patient assumes the right lateral recumbent position, the majority of patients will reveal a uniform filling of the entire small intestine in one hour.

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Observations on the use of Aqueous contrast media in Hysterosalpingography

BY

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The place of Hysterosalpingography as an aid in diagnosis of gynaecological conditions is well-established. The search for an ideal contrast medium for this procedure temporarily came to a halt with the discovery of the iodised oils (Lipiodol, Neo-hydriol); but during the last two decades there has been a growing realisation of the drawbacks of this group of substances, *viz.*, the serious immediate risk of embolism, failure to enter a stenosed tube, delayed absorption causing foreign-body reactions in the pelvic peritoneum with peritubal adhesions, unsatisfactory demonstration of hydrosalpinx. Thus, *Rubin* (1947) says it is best to stop using iodised oil in cases of sterility, while *Freeth* (1952) definitely discredits the use of oily media and *De Boer* (1954) has conclusively demonstrated the granulomatous reaction due to oily media. Hence the search for a safer and more perfect contrast medium was renewed.

As early as 1929, *Swick* used "Uroselectan" to visualise the female genital tract: and *Neustaedter*, in 1933, added 50% glucose solution to the crystalline iodine compounds to give a syrupy, viscous medium. To increase the viscosity of aqueous media, different workers have combined the organic iodine-containing compounds with various thickening agents, *viz.*, dextrose, starch, glycerine, propylene-glycol, tragacanth, acacia, polyvinyl alcohol, dextran, carboxymethylcellulose (C.M.C.), polyvinylpyrrolidone (P. V. P.) *Rubin* used Diodrast (1939)

and Visco-rayopaque (1941), *Jefferiss & Samuel* used Pyelosil (1946), *Davies* used Endografin (1957); while *Reiss & Grossmann* (1958) tried 'Uriodon 35', Endografin, Biligrafin 50% and Urografen.

This work was undertaken in order to find out the radiographic contrast and early toxicity of various aqueous media in Hysterosalpingography and to determine their suitability for routine use. The following water-soluble contrast media were given a trial:—

A. 'Diaginol' 50% (May & Baker, England)

It is a brand of sodium acetrizoate (Urokon sodium) and is derived from benzoic acid. Iodine content 33%. Solutions are stable to autoclaving and must be protected from sun-light. Excreted in unchanged form by the kidneys (60% eliminated in 3 hours; all of it, in 24 hours). Side-effects may be nausea, vomiting, sensation of heat, weakness and thirst, headache, pallor, pruritus, tachycardia, hypotension, vasomotor collapse. No delayed reactions have been reported.

B. 'Biligrafin Intravenous Forte' 50% (Schering, A.G. Germany)

It is the methylglucamine salt of a benzoic acid derivative. Iodine content 25%. Viscosity at 37°C. is 6 cps.; pH value 7.5. The liver excretes 90%. Even when injected into the uterus, the absorption from the

uterine mucosa and pelvic peritoneum causes visualisation of the gall-bladder after a few hours. 10% is excreted by the kidneys. Toxicity may manifest as restlessness, feeling of heat, lowering of systolic blood-pressure, nausea, vomiting, collapse.

C. 'Hydrombrine 60' (Dagra, Holland)

It is the 60% solution of a methylglucamine salt of an acetic acid derivative. Iodine content 25%. Rapidly absorbed. Excreted by liver and kidneys.

D. 'Diaginol Viscous' 40% (May & Baker, England)

Similar to 'Diaginol' 50%. Prepared with a specially selected low molecular weight fraction of dextran to increase the viscosity. Iodine content 26%.

The use of all these media is contra-indicated in renal or hepatic or cardiac insufficiency, thyrotoxicosis, severe anaemia, idiosyncrasy to organic iodine compounds.

Material and Methods.—The observations are based on a series of 50 cases of hysterosalpingographies carried out during the last two years at the Department of Radiology, King George's Medical College, Lucknow. All the patients were outdoor cases referred from the Department of Obstetrics and Gynaecology, (Queen Mary's Hospital), Lucknow, for the investigation of primary or secondary infertility, habitual abortion, menstrual disorders.

Since the work is meant to deal chiefly with the technique of examination and suitability of contrast media, I have omitted a detailed analysis of the results.

The points noted on questioning the patient were:—her name and age, presenting symptoms, duration of marital state,

family and menstrual and obstetric histories, relevant clinical findings, previous investigations and treatment.

Sensitivity to organic iodine compounds was tested by the subcutaneous instillation, on the middle of a forearm, of 0.2 c.c. of the solution from a test ampoule; the reaction was noted after thirty minutes.

In most cases, the investigation was carried out about the tenth day of the menstrual cycle.

The procedure was explained to the patient and she was reassured of its harmlessness when she first attended the department.

A laxative was administered the previous day.

After taking breakfast, the patient attended the Radiology Department at the appointed time. She was asked to wear light cotton clothing or was provided with a hospital gown.

Initial blood-pressure was recorded and a "Tranquilliser" administered one hour before injection of the medium.

Patients who had shown iodine-sensitivity were given 'Avil' (orally or parenterally) as a prophylactic measure.

The patient emptied her bladder and was placed on the X-ray couch in the modified lithotomy position and the patient was draped. A vaginal examination was done and abnormal findings noted.

Glyceryl trinitrate 0.32 mgm. (1/200 gr.) was administered sublingually to obviate tubal spasm. From the twenty-first case onwards, pelvic diathermy was given immediately preceding instillation of the medium (also to aid tubal relaxation).

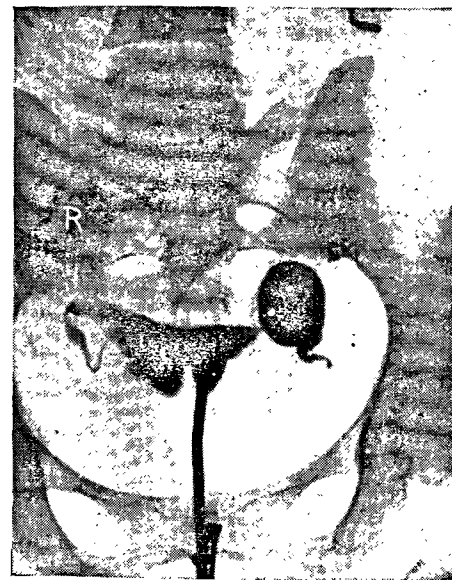


Fig. 1

Case No. 15, Mrs. M. D. Secondary Infertility, P_1+0 Diagonal 50%, immediate. "Leaking" Hydrosalpinx (Left)

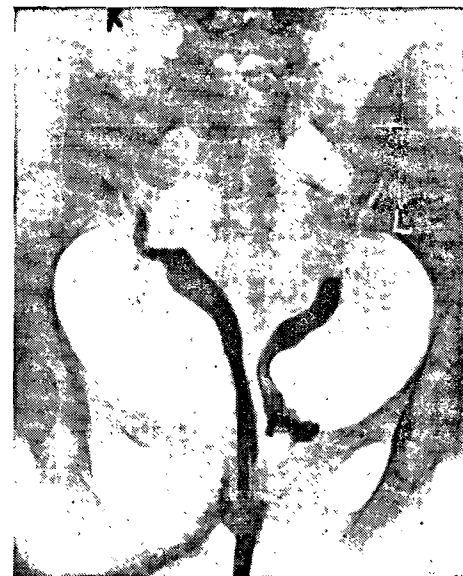


Fig. 2

Case No. 17, Mrs. K. A. Habitual abortion. P_0+8 Diagonal 50%, immediate. Uterus approximates to Bicornis unicollis type. Right cornu harboured three previous pregnancies; patient conceived the following month and was subsequently delivered (breech presentation) of a 34 week foetus, by the normal passages.



Fig. 3

Case No. 19, Mrs. S. S., Primary Infertility, P_0+0 Immediate skiagram with 'Hydrombrine 60'. Bicornuate uterus.

Discussion and Evaluation of Findings

The main object of this work was to determine whether aqueous media gave satisfactory results without undue toxicity.

Negative results (non-visualisation of tubes or of peritoneal spill) are unreliable and confusing; one of the main factors responsible for causing false negative results is tubal spasm. For prophylaxis of this condition, preliminary sedation (Equanil, Largactil, Oblivon-C) was given as a routine. From the twenty-first case onwards, pelvic diathermy was given in each case; it seems that this procedure, preliminary to the instillation of the contrast medium, effectively reduces the amount of peritoneal reaction. Glyceryl trinitrate was administered sublingually on the table to all patients (except two); there was no significant fall in blood-pressure in any case in which it was used. The sequence of events was explained to the patient and she was reassured that nothing untoward would happen.

The dubious value of Iodine sensitivity tests is illustrated by the false negative result of case No. 4 (no sensitivity; but peritoneal irritation 3 +).

Use of anaesthesia of any type and of manometry were not found necessary; excessive pressure was avoided while injecting the contrast medium.

Fluoroscopy was used as an adjunct to diagnosis in 7 cases. The results with fluoroscopy were poor; the uterus could be seen, but finer details (including tubal patency) were never visualised, probably due to the comparatively low viscosity of these media. For the same reason, perhaps, peritoneal "spill" could not be detected on "screening". This procedure does not seem to be

A Sim's speculum was introduced and the vagina and cervix were cleaned. The cervix was seized by a volsellum forceps and a uterine sound was passed. Jarcho's cannula (with a rubber olive) was attached to a 20 c.c. Record syringe containing the medium, and after expelling air from the cannula it was inserted into the cervical canal. The contrast medium was warmed to body temperature in cold weather. The speculum was removed, the patient released from the lithotomy position, and arranged on the X-ray table.

Counter-traction was applied to the volsellum to ensure a good seal and prevent leakage. The head-end of the patient was lowered 5-10 degrees when the cervical os was found to be patulous (to prevent leakage). The contrast medium was injected and a skiagram taken, with or without preliminary fluoroscopy. In the later stages, fluoroscopy was deleted from the routine since it was a cumbersome, lengthy procedure and did not supply much information.

Once the wet film was found to be satisfactory the cannula was removed, the vagina cleaned, and a sterile pad given. Meanwhile, the patient was asked to rinse her mouth and her blood-pressure was checked. She was kept under observation for half an hour, preferably in a reclining posture. Follow-through skiagrams were taken when considered necessary.

Before she went home, and on subsequent meetings, the patient was questioned about any side-reactions and these were noted.

Radiographic details.—An over-couch tube was used with the Potter-Bucky diaphragm and intensifying screens. The exposure factors were:

63-75 KvP., 100-130 mAS., 30 inches target-film distance.

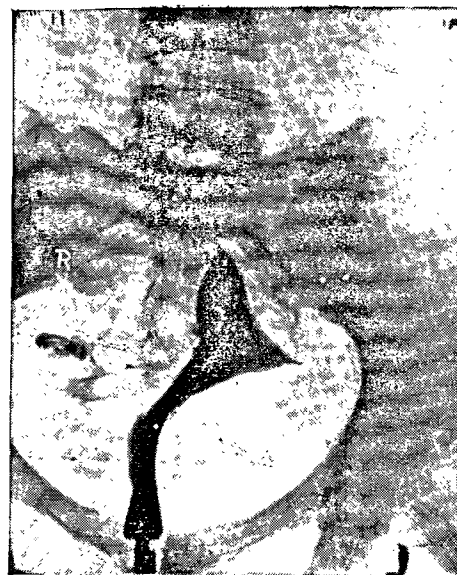


Fig. 4

Case No. 23, Mrs. K. K. Habitual abortion, $P_0 +$, Biligrafin Forte, immediate. Filling defect along right lateral uterine wall (myoma?).

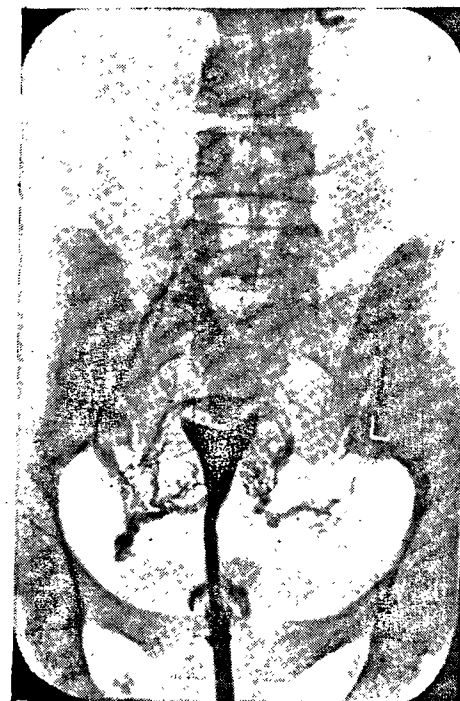


Fig. 5

Case No. 27, Mrs. S. K. Primary Infertility, $P_0 +$, Diaginol 50%, immediate. Intravasation of contrast medium. With an oily medium, this may have ended fatally! Taken on 12th day of a 30/32 day menstrual cycle.

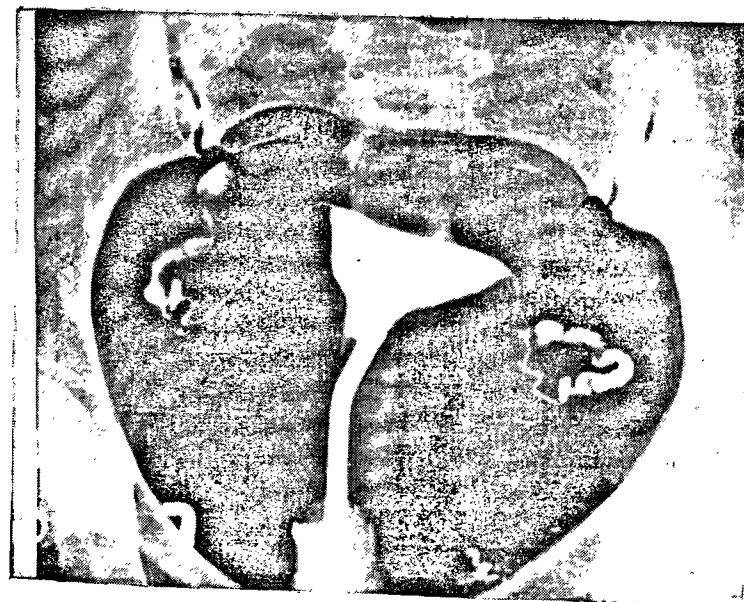


Fig. 6

Case No. 29, Mrs., S. C. J. Primary Infertility, $P_0 +$, Diaginol Viscous 40%, immediate. Infantile uterus; both tubes patent. (Positive Print).

of much help and should not be used as a routine.

Intravasation of the medium occurred in one case (Case No. 27) with no untoward effect.

The radiographic density is satisfactory with the aqueous media; it improves if care is taken to clear the lower bowel and the bladder.

The immediate 'Spill' usually obtained with the aqueous media is unquestionable proof of the patency of a tube; thus, a single film can provide rapid and conclusive diagnosis.

The folds or plicae of the tubal mucosa run parallel with the long axis of the tube and this mucosal pattern is seen radiologically, in many normal cases, as a series of longitudinal ridges.

The aqueous media rapidly run out of the uterus and are absorbed quickly. After a few minutes the uterus cannot be identified (because the medium quickly flows out of the os and the tubes) and all the pelvic "spill" normally vanishes in about 1-1½ hours. In the beginning, this caused great trouble with Diaginol, but it was overcome by taking the exposure during the end of the injection. Again, the procedure is likely to fail if a water-tight seal is not obtained, e.g., the cervical os is patulous, counter-traction is not applied to the volsellum, equipment is ill-fitting and leaky (this happened in two cases). Hydrombrine '60' does not vanish from the uterine cavity as rapidly as the other three media. If the cervical os is found to be patulous, leakage of medium can be prevented by lowering the head-end of the patient 5 to 10 degrees.

These media sometimes cause excessive peritoneal "spill" which confuses the picture. This may be prevented by injecting a maximum of 10 c.c. in routine cases.

No grave toxic reactions were encountered in this series. In one of the two cases in which it was used, Biligrafin Forte gave rise to fairly severe peritoneal irritation—this was also reported by Sandler and O'Driscoll (1956) who worked with this medium. The reaction of case No. 4 with Hydrombrine was distressing and alarming but it apparently left no permanent ill-effects. The reactions with Diaginol 50% and Diaginol Viscous 40% were mostly mild—only one patient complained of severe pain, and she had shown Iodine sensitivity. Hydrombrine causes more chemical irritation than any of the other media.

Apart from lower abdominal pain (caused by chemical irritation of the peritoneum), other reactions noted were fever with rigor, headache, low-back pain, excessive thirst, a burning sensation in the region of the urethra and a feeling of warmth throughout the body.

Of the four aqueous media used, Hydrombrine appears to be most toxic, Biligrafin less toxic, Diaginol 50% and Diaginol Viscous 40% having the least toxicity. Diaginol 50% gives better radiographic contrast, but it flows through the tubes too rapidly; while Diaginol Viscous 40% reveals a more static picture, though its contrast is somewhat inferior.

In conclusion, it may be said that water-soluble contrast media are very satisfactory for Hysterosalpingography and those of low toxicity should be used for routine work till a more perfect medium is made available.

CONTRAST MEDIA USED IN THIS SERIES

S. No.	Name of Medium	Iodine Content w/v	Water Solubility	Average dose needed	Test dose supplied	No. of patients tried on	Radio-graphic contrast	Absorption	Toxicity Noted
1	Diaginol (50%) ...	33%	Soluble	8—10 c.c.	No	18	Adequate	Rapid	13 Cases, 1 + 4 Cases, 2 + 1 Case 3 +
2	Biligradin Intravenous ... Forte (50%)	25%	Soluble	8—10 c.c.	Yes	2	Adequate	Rapid	1 Case, 2 + 1 Case, 3 +
3	Hydrombrine '60' ...	25%	Soluble	5— 8 c.c.	Yes	8	Adequate	Fast	3 Cases, 1 + 1 Case, 2 + 4 Cases, 3 +
4	Diaginol Viscous 40% ...	26%	Soluble	8—10 c.c.	No	22	Adequate	Rapid	19 Cases, 1 + 3 Cases, 2 +

KEY TO TOXICITY NOTED:

1 + = mild reaction ; 2 + = moderate reaction ; 3 + = severe reaction.

Summary

Four aqueous contrast media were employed in investigating 50 cases for purposes of Hysterosalpingographic investigation. The technical difficulties encountered with these media are discussed. These media all showed adequate radiographic contrast, revealed details fairly clearly, permitted rapid and correct diagnosis, were rapidly absorbed and easy to inject. Of the four,

Diaginol Viscous 40% showed most clear visualisation of tubal patency combined with minimal transient toxicity and no evident delayed side-effects.

Acknowledgement

I desire to express my gratitude to the Registrar, Lucknow University, for permission to incorporate in this paper the findings of my thesis for M.D. (Radiology).

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Left Ventricular Hypertrophy Syndrome in Infancy and Childhood

BY

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Cardiac hypertrophy in childhood has been a subject of considerable importance for many years. Many case reports have appeared recently in literature describing diverse cardiac lesions in infancy and childhood with similar clinical manifestations. (1) Rosenbaum described this group of diseases under the common heading "primary myocardial disease in infancy and childhood". Sidney Bluementhal, M.D., F.C.C.P. and Samuel O. Sapin, M.D. of New York (2) consider that most of these lesions are not of primary myocardial origin and since they produce left ventricular hypertrophy as the predominant anatomic finding; they offer "Left Ventricular hypertrophy syndrome" as a better descriptive title.

"Left ventricular hypertrophy syndrome in infancy is characterised by (1) cardiac enlargement—predominantly of the left ventricle (2) Absence of significant heart murmurs (3) absence of central cyanosis (4) electrocardiographic findings which are either normal or indicative of myocardial damage or of left ventricular hypertrophy; (5) at times symptoms and signs of cardiac failure.

There are a number of rather common congenital malformations producing left ventricular hypertrophy in the absence of cyanosis which occur in infancy and childhood like patent ductus arteriosus ventricular septal defect, aortic or subaortic stenosis as well as coarctation of the aorta. These are accompanied by

significant murmurs and these cases are excluded from the "Left ventricular hypertrophy syndrome" under discussion.

The lesions associated with this syndrome are conveniently described under three headings (1) cases in which the predominant lesions is [endocardial as in primary endocardial fibroelastosis (2) cases in which myocardium is primarily involved and (3) cases in which there is a predominant alteration in the function of the coronary arteries.

In a typical case of left ventricular hypertrophy syndrome in childhood, the usual history is that of a previously healthy baby who has begun to eat poorly with restlessness and fatigue. There may be episodes of pain. Increase in restlessness may be followed by respiratory failure. On examination there will be dyspnoea, tachycardia enlargement of the heart mostly enlargement of left ventricle and in some instances gallop rhythm and poor heart sounds. Hepatomegaly is often present with associated heart failure. There is no central cyanosis—cyanosis if present is only transient or terminal. Heart murmurs are conspicuously absent—Even if present may be inconsequential apical soft murmurs. Peripheral edema is not a common sign except as a late complication. Lungs are usually clear except for atelectases by enlarged heart. Radiologically there will be considerable enlargement of the heart, heart being globular and often the criterion

of left ventricular enlargement may be satisfied. The LAO view radiograph may reveal enlargement of the left ventricle (the posterior heart boundary is projected over the spine even when turned more than 55°. The electrocardiogram may be diagnostic of left ventricular hypertrophy or reveal ST or T wave abnormalities indicative of myocardial anoxemia or damage.

I shall briefly discuss the chief lesions which result in or constitute the left ventricular hypertrophy syndrome. (1) Primary endocardial fibro-elastosis is one of the most common causes of left ventricular hypertrophy syndrome. Kelly and Anderson reports 79 cases from literature (1959) and added 17 cases of their own. Perhaps a large number of cases are not reported. They emphasised endocardial fibro-elastosis into 2 groups (1) Those which are not associated with congenital malformation of the heart (2) those associated with congenital malformations in which endocardial thickening is secondary to haemodynamic lesions related to congenital cardiac malformations. No. 2 group is excluded from left ventricular hypertrophy syndrome. There are two views regarding the cause for primary endocardial fibro-elastosis (1) It is a simple hyperplasia of endocardial fibroclastic tissue—not inflammatory but rather a developmental defect (2) the concept of endocardial anoxia as the stimulus which produces endocardial fibro-elastosis. The clinical findings in primary endocardial fibro-elastosis is similar to those described for the entire left ventricular hypertrophy syndrome—significant heart murmurs are absent in more than 80 per cent of the cases. Cardiac hypertrophy is demonstrable by physical and Roentgen examinations. E.C.G. shows no pathognomonic features.

Cardiac catheterisation done in a few proven cases shows. Right ventricular and

pulmonary arterial pressures normal or slightly elevated with elevation of pulmonary capillary pressure. Features of constriction pericarditis has been reported in adults with severe endocardial fibrosis. Angiocardiograms reveal poor emptying of the left ventricle. These findings might support the theory that heart fails in primary endocardial fibroelastosis because thickened endocardial coating prevents proper cardiac contraction or that of a primary muscle dysfunction. This is essentially a disease of infancy. Some cases survive into childhood—a eleven year old child has been described by Blumberg and by Thomas—Pathological counterpart seen in adults—80% die within 1 year—It is not clear that whether those seen in adults indicate survival of infantile syndrome or represent separate entity—These cases improve slightly with Digitalis, oxygen and supporting Therapy.

II. *The second group* is primary predominantly myocardial disease such as (1) idiopathic or aseptic myocarditis (b) glycogen storage disease of the heart with deposition of large amounts of glycogen in the myocardium and striated muscle and which is distinctly different from glycogen storage disease of liver (c) tumours of the heart and (d) nutritional deficiency states causing myocardial dysfunction.

(a) *Idiopathic myocarditis* is a relatively uncommon disease characterised by an acute inflammatory involvement of the myocardium without any recognisable associated disease. Pathologically there is hypertrophy and dilatation which is generalised or at times confined to the left ventricle. In one case, the degree of myocardial involvement was so great as to result in the formation of a ventricular aneurysm. Microscopic examination reveals evidence of acute inflammation as well as fibrosis and scarring. Aschoff bodies are not

demonstrable and valves are spared. Coronary arteries are normal. Idiopathic myocarditis is probably caused by a variety of agents including bacteria and viruses. At times distribution is epidemic in character—no endocardial or pericardial involvement—viral etiology is suggested—In some cases with acute myocarditis coxsackie group B virus is separated from faeces. Clinical picture is similar to that caused by other conditions, resulting in left ventricular hypertrophy in infants—The onset is sudden and the entire course may be a rapidly fatal one. In some it may take a chronic course lasting months. In non fatal cases, recovery is complete without valvular or myocardial residue. Fluoroscopy and radiological examination reveal general cardiac enlargement especially left ventricle. E.C.G. demonstration ST segment and T wave changes consistent with myocardial anoxia or damage.

(b) Glycogen storage disease of the heart is an exceedingly rare disorder resulting in deposition of large amounts of glycogen in heart and skeletal (striated) muscles. This is a commonly a famalial disorder. Patients are normal at birth but acquires symptoms in early infancy. They develop poorly. Tachy-cardia and dyspnoea are early signs. Tremendous enlargement of the heart is an early finding. Murmurs are conspicuous by their absence. Disante Agnissie noted macroglossia in several cases. Glucose tolerance and glucose mobilisation are normal—no ketonurea. Roentgen findings is generalised enlargement of heart. E.C.G. show T wave abnormality and Left Ventricular enlargement. No gross enlargement of liver as seen glycogen storage disease of the liver. Family history of several children died under similar conditions, cardiomegaly especially of the left ventricle and macroglossia and excessive glycogen in skeletal muscle on biopsy help in diagnosing the

condition. No satisfactory treatment for this metabolic disease.

(c) *Tumours*.—Primary tumours are rare in infancy. Kidder found a total 69 primary tumours as Rhabdomyoma in his review of literature, with half of them in the first year of life—Others found in patients with tubero-sclerosis—Heart is enlarged and the characteristics of left ventricular hypertrophy syndrome are noted. Murmurs may not be present Arrhythmias are often present. Fibroma of myocardium, myxoma and Rhabdomyosarcoma have been observed.

(d) Nutritional deficiency states especially Thiamine deficiency and scurvy which are usually seen in allergic infants in U.S.A. receiving elimination diets. They develop cardiac hypertrophy. Heart size is reversible in early cases with suitable Thiamine and Vitamin C treatment.

(iii) Inadequate coronary blood flow results in left ventricular hypertrophy syndrome in infancy and childhood.

This may be due to (a) anomalous origin of the left coronary artery. The more common form is the origin of the anterior descending branch from pulmonary artery or conus while the circumflex arises from the aorta. However the entire left coronary artery may have an anomalous origin (post mortem findings) Bland, White and Garland have demonstrated that scarring of myocardium occurs, being concentrated usually towards the endocardial side of the anterior wall of the left ventricle and septum following the distribution of left coronary artery. There may be myocardial necrosis and aneurysmal dilatation of the apex of the left ventricle. The clinical picture of the anomalous origin of left coronary artery resembles closely of left ventricular hypertrophy syndrome. Feeding difficulties occur

early in infancy with angina like attacks. Feeding or exertional efforts precipitate it. Upon examination heart is found to be markedly enlarged with primary involvement of left ventricle. Significant murmurs are not heard. E.C.G. show inverted T waves in segment I and II with low voltage and ST segment deviation. In most cases death occur in 1 year. There are reports when such cases have reached adulthood. It is of practical importance to establish antemortem the existence of the abnormal origin of the left coronary artery. Aortography may be a useful adjunct in establishing the presence of an anomalous left coronary artery. The injection of the dye into aorta may permit radiographic visualisation of the coronary arteries and their origin. Surgical correction aimed at increasing the oxygen content of blood entering the anomalous coronary artery has been attempted.

(b) *Coronary occlusive disease*.—Medical sclerosis of the coronary arteries is the most common form of occlusive disease in infancy. Sclerosis and calcification are found

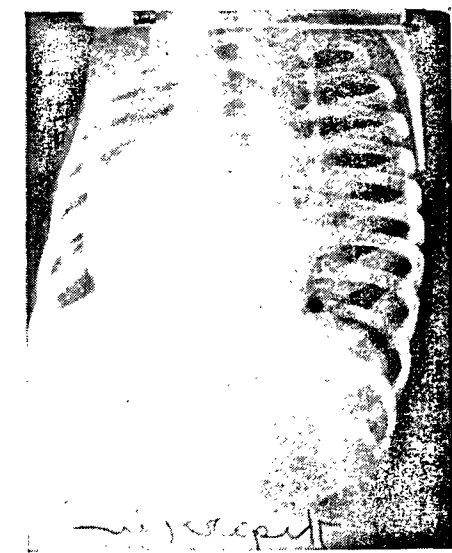
in the media and fibrous proliferation of intima occludes the lumina of vessels. No lipoid deposit occurs. Thrombi may be present in the lumen. Coronary occlusive disease in infancy result death in early infancy and may be idiopathic. Clinical picture is that noted in other lesions in left ventricular hypertrophy syndrome. Anderson reported calcification in upper extremities and Cochrane suggests the possibility of calcification in neck vessels. E.C.G. may reveal non specific myocardial anoxia, left ventricular hypertrophy or myocardial infarction.

Now I shall briefly give the history, clinical and radiological findings of 2 children which fit in with the diagnosis of left ventricular hypertrophy syndrome.

Case I.—Thiaga Rajan Age 6 years, Male, son of a carpenter was admitted on 9-6-59 at the Willingdon ward (Pediatric Department) under Dr. A. T. John, the Pediatric Physician of Stanley Hospital, Madras, and discharged against medical advice on 15-1-60.



Thiaga Rajan, P. A. View Chest.



Thiaga Rajan, L. A. O. View Chest.

Complaint.—Cough 6 months and dyspnoea 4 days. No history of any previous illness. There is no cyanosis.

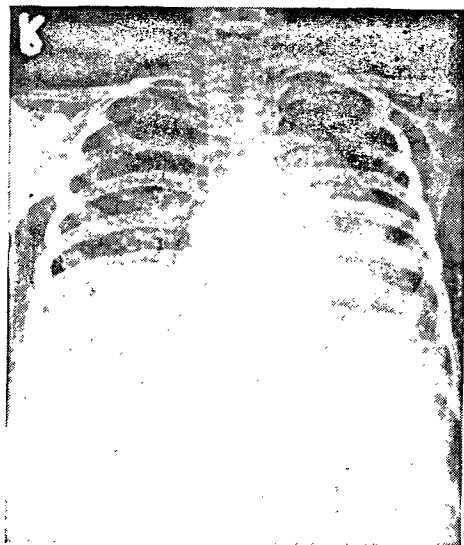
Cardio vascular system.—Pulse 100 per minute. Heart boundaries enlarged on percussion. Heart sounds heard. No cardiac murmurs.

Respiratory system.—Respiratory rate is 40 per minute. Trachea is in the middle line. A few rales and ronchi are present in both lungs.

Alimentary system.—Abdomen is slightly distended. Liver is palpable about 3 fingers below costal margin. Spleen is palpable one finger's breadth below the costal margin.

Radiologic findings.—Heart is globular with enlargement of the left lower border. In the LAO view radiograph there is a definite enlargement of the left ventricle as shown by the projection of the posterior border (left ventricle) over the spine. There is no definite cardiac failure.

Lab. findings.—Blood R.B.C. 4.45 millions per c. mm. Hb. 90 per cent. W.B.C. 6800 per c. mm. B.P. 100/64.



Chittarasu, P. A. View Chest.

Serum Vandenburg's test below 2 in 1 minute.

Thymol turbidity test—11 units (normal 0 to 4 units). Total cholesterol content of serum 280 mg. % (normal 160 to 260 mg). Serum total protein 7.02 gm. %. Serum globulin 4.10 gm. per cent. There is gross reversal of serum globulin albumin ratio. Treated with aminophyllin, glucose, coramine, digoxine.

Here is a child of 6 years with anatomic left ventricular hypertrophy, acyanotic, with dyspnoea and without any cardiac murmurs. This will fit with the diagnosis of left ventricular hypertrophy syndrome. The age is more than normal.

Slides 1 and 2 Globular heart with definite left ventricular enlargement in LAO view minimal cardiac decompensation.

Case II.—Sitha Ram aged 8 years, male admitted into the Willingdon ward under Dr. A. T. John, on 6-7-59 with dyspnoea. Swelling of face, cough and fever.



Chittarasu, L. A. O. View Chest,

History.—At the age of 8th month, the child had chickenpox and diarrhoea. Had occasional diarrhoea upto 2½ years. Afterwards child not playing and gets breathless after exertion. Gets breathless especially after feeds and not playing. Child is not cyanotic. General condition—slightly anemic and ill nourished, tongue moist—no glands are palpable in the neck or axilla. Tonsils not enlarged.

Cardiovascular system.—Precordial pulsation seen. Apex beat in 5th space in mid clavicular line. Heart borders are not appreciably enlarged. Heart sounds are well heard in all the four areas.

No murmurs are heard. Rythm is regular.

Respiratory system.—48 per minute. There is tachycardia. Both lungs move equally. Trachea is in the middle line. No tactile fermitus—Resonance diminished in base. Rales are heard all over.

Abdomen.—No free fluid in the abdomen. Abdomen moves well with respiration. Liver is felt one finger breath below costal margin. There is no upward enlargement of the liver. Kidney is not palpable. There is no tenderness in the loins.

Pulse rate.—120 per minute. Volume and tension good, B.P. 90/50. Urine on 6-7-59 albumin nil—No sugar, No. R.B.C. on 25/7 alb. + H.B. 65%, W.B.C. 9400, p64 L28.

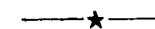
Stools.—Ova nil—Cysts nil.

X-ray findings.—PA view left lower border appears considerably enlarged. There is hilar congestion and haziness at the bases of the lung field showing decompensation.

LAO view.—Both borders of the heart appear enlarged. But the left ventricle is definitely enlarged and is well projected over the spine posteriorly.

Slides 3 & 4.—Brings out these roentgen findings clearly. Dyspnoea, tachycardia, absence of cyanosis, absence of murmurs in as cultation with the definite roentgenological enlargement of the left ventricle. All these findings well fit in with the diagnosis of left ventricular hypertrophy syndrome possibly a case of endocardial fibroclastosis. But age incidence is higher.

I am thankful to the Dean of the Stanley Medical College and Hospital, Madras for permission to publish case reports.



Osteitis Condensans Ilii

BY

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Condensing osteitis of the ilium in its true form is not common and it is a condition purely recognisable roentgenologically. Roentgen studies show increased density in the auricular portion of the ilium with absence of corresponding changes in the sacro-iliac joint and in the contiguous portion of the sacrum. Its importance lies in its distinction from rheumatoid spondylitis, sacro-iliac arthritis due to Marie-strumpell variety, sacro-iliac epiphysitis and other degenerative arthritis.

The first case of this entity was demonstrated at the British Institute of Radiology in 1924 by Dr. J. F. Brailsford. In 1926, Sicard, Gally and Hagenau reported five cases. In 1928, Barsomy and Polgar applied to it the descriptive term "osteitis condensans illi". The total number of cases recorded in the literature may not exceed ten.

Berent in 1932 suggested that it might be a complication of pregnancy since it is more common in females. It is said to occur exclusively in females between the ages of twenty and forty in married individuals who have borne more than one child, seldom seen in women past sixty years of age. At this juncture it is worthwhile stating that this disease has been described in young, unmarried females and also in males. In 1944 Hare and Haggart reported

a series of female patients with this condition some of whom nulliparous and stated that the condition might represent a disturbance in the circulation. In several of the patients, there was a history of trauma, in some instances related to childbirth which may be considered a possible cause for alteration in the blood supply in the inferior portion of the ilium in the region adjacent to the sacro-iliac joint. This condensation of living bone would appear related to strain and is explained as follows. The sacro-iliac joint is an amphiarthrosis, the auricular surfaces of the sacrum and ilium being separated by thin plates of cartilage. In the young adult these cartilaginous plates are intimately blended with each other. During later years they become separated by fluid with the formation of a joint space, thus converting the articulation into a diarthrosis. The motion involved in this joint is minimal, the sacrum tending to rotate forward about a fulcrum situated in the vicinity of the second sacral segment. The sacrum does not actually form a keystone in the posterior arch of the pelvis. Its auricular surfaces are more widely separated anteriorly than posteriorly and for this reason the bone tends to be displaced forward into the pelvis with the patient in the weight-bearing portion. The interosseous and posterior sacro-iliac ligaments resist this by becoming taut thus forcing the illi

more closely together. An additional factor which interferes with the stability of the articulation develops during pregnancy, as relaxation of the sacro-iliac ligaments and other pelvic ligaments occurs. The auricular portion of the ilium resists the thrusts of the sacrum as the latter rotates. It is believed that the pressure exerted upon the par-articular surface of the ilium is the cause of the condensation which is noted roentgenologically.

Rendich and Sharpiro interpret the changes of the iliac bone removed from the patient with condensing osteitis, as representing a low-grade nonspecific ischemic process.

Symptoms

Chronic low back pain is the chief complaint, localised to the sacro-iliac region, but may radiate to one or both buttocks. There is no aggravation of symptoms as a

result of coughing or straining. It is aggravated by activity and rest gives relief from pain. The pain in the course of time becomes continuous, slowly increasing in severity to seek relief.

Physical Examination, is usually negative. Laboratory findings are not helpful.

Case-Report

Mrs. L., aged 35 was referred to x-ray department on 24-8-60, with the following complaints—pain in both sacro-iliac joints, bearable in nature for the past ten years but has become severe in nature and continuous for the past two years. The pain does not radiate. The pain is more when the patient is walking than on lying on the back.

The patient is the mother of eight children, all delivered normally.

Antero-posterior view of Sacro-iliac Joints.

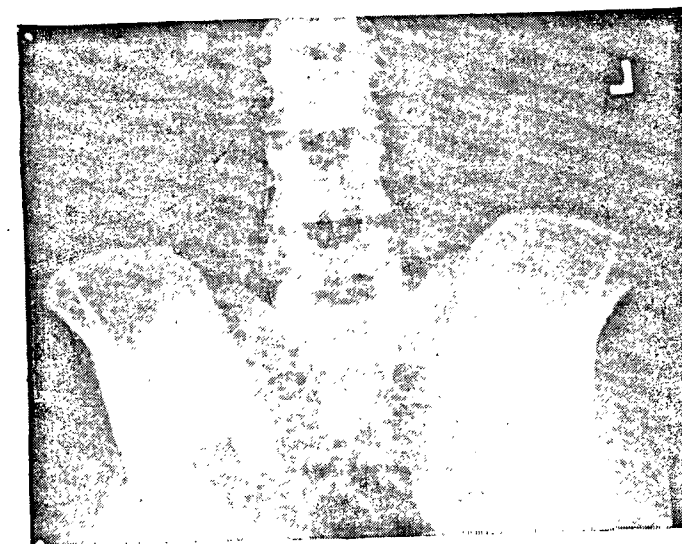


Fig. 1

Shows a lesion having a sclerotic appearance in the illi adjacent to the sacroiliac joints, with a rather sharp demarcation between the condensed bone and the adjacent normal bone.

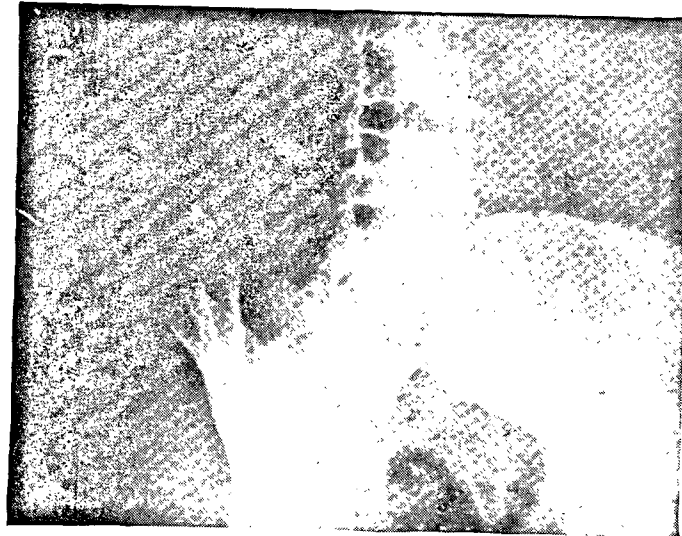


Fig. 2



Fig. 3

Fig. 2 and 3—Right and Left oblique projections of the sacro-iliac joints show that the sclerosis does not cross the joint into the adjoining wing of the sacrum.

Physical Examination-General.—The patient is a family nourished individual of thirty-five years and is not anaemic. No other positive findings noted.

The examination of respiratory, cardiovascular, alimentary and nervous systems did not yield any positive findings.

Local Examination of sacro-iliac joints did not reveal any swelling, warmth or tenderness.

P. V. Nothing abnormal made out.

X-ray of the sacro-iliac joints. A flat sacral projection was taken, and also oblique projections of the sacro-iliac joints. There was a narrow triangular band of increased density in the medial aspect of the ilium adjacent to the sacro-iliac joint on each side and oblique views confirmed that the sacrum was not involved by this condensation process. The diagnosis is based upon a sclerotic appearance of the ilium adjacent to the sacro-iliac joint, with a rather sharp demarcation between the condensed bone and the adjacent normal bone. The disease is ordinarily self-limited and this must be differentiated from the following conditions — Rheumatoid spondylitis. In some cases of this entity, there is a somewhat similar sclerosis of the ilium. This condition is common in the male. There is an elevated

sedimentation rate. Roentgenologically, there is narrowing or obliteration of the sacro-iliac joints with osteoporosis of the bones associated with an egg-shell type of paraspinous ligamentous calcification.

Other conditions which may be considered in the differential diagnosis and excluded are:—(1) Sacro-iliac epiphysitis. (2) Asymmetry of the lumbo-sacral facets; (3) Paget's disease and (4) Other types of degenerative arthritis.

Summary

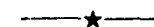
A case of osteitis condensans illi is reported in a nulliparous woman, aged thirty-five, with a review of the literature.

Acknowledgements

Our sincere thanks are due to Dr. K. M. Rai, M.B.B.S., F.R.C.S., D.M.R. (E), The Professor of Radiology, The Madras Medical College, Madras and The Director, The Institute of Radiology, and The Barnard Institute of Radiology, Madras for his advice and encouragement. Our thanks are also to Dr. K. G. Krishnaswamy, M.S., Dean, The Government General Hospital, Madras, for his permission to report this case. Our thanks are also due to Sri Natarajan, the artist, for the prints.

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Angiography in Leprosy

BY

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Introduction

In the non-lepromatous type of leprosy, the neurological manifestation is a prominent feature and this is due to pathological changes in the nerves (Khanolkar, 1952, Editorial, 1952) but whether these pathological changes are primarily due to nerve or vessels is still debatable.

The hypothesis that occlusion of the vasa-nervorum may be responsible for peripheral nerve disorder and for the pathological changes observed occasionally in the affected nerves was first propounded by Isenflamm and Doerffler (quoted by Ramu, 1960). Ramage (1927) was however the first to evolve a working knowledge of the vascular system of the peripheral nerves of the upper extremity in which he said that the circulation in the nerve trunks, cords and peripheral nerves is maintained by several nutrient arteries. Adams (1941) reiterated the fact that for the proper functioning of the peripheral nerves, the integrity of their blood supply is essential. It had been observed that in a sudden occlusion of a main vessel *i.e.* thrombosis, embolism, or spasm, the accompanying motor, and sensory effects are primarily the result of ischaemia of the nerve trunks. He demonstrated degeneration of nerve fibres and a restoration of the function of the nerves when collateral circulation was established.

The nerve symptoms of non-lepromatous leprosy have a close relationship with the blood circulation, which has been demonstrated clinically, therapeutically and experimentally (Chatterjee, 1955). This may be caused by (a) pressure of a thickened nerve sheath over vasa-nervorum and this is probable as pressure can affect blood vessels more deliberately than an axon, (b) pressure from cellular infiltration between the nerve fibres on vasa-nervorum (c) pathological changes in the blood vessels (De Josselin de Jongh, 1934; Fite, 1941). The lower temperature in an anaesthetic area of leprosy lesion is indicative of less active blood circulation in the anaesthetic parts, due to contraction of the blood vessels and after application of heat, the anaesthetic parts always showed a higher temperature than the normal parts, indicative of less dissipation of heat. This is ascribed to insufficient dilatation of blood vessels causing more accumulation of heat in the anaesthetic parts than in the corresponding normal parts (Chatterjee, 1959). Per-arterial sympathectomy (Cruz *et al*, 1931). Novocaine blockage (Vishnevsky, 1938) and sympathetic ganglionectomy (Goheen, 1933) were tried in the management of trophic ulcer of leprosy, as these may result in better circulation of the affected parts from the dilatation of constricted blood vessels will cause temporary alleviation of symptom.

Similarly vasodilator drugs have been used intraarterially or orally for the treatment of trophic ulcer of the foot (Gokhale, 1957; Caver, 1957; Marry *et al*, 1958; Fritsch, 1959) with little success.

Whether the blood vessels play any important pathological part in the neural manifestation of non-lepromatous leprosy, serial angiograms had been taken by different workers (Leitner, 1938; Faget and Mayoral; 1944, Paterson, 1955; Chardome and Lechat, 1958; Bang & Tiep, 1958; Cochrane & Robert, 1958. The changes which they found are not comparable with one other. It was decided, therefore, to investigate the vascular pattern of the upper extremity by angiography.

Material and Method

Twenty non-lepromatous cases were selected for this study where polyneuritic changes were present in all cases. In most of the cases (18) the polyneuritic changes were limited to one side of the upper extremity, only in two cases the polyneuritic changes were present in more than one extremity. Of the 18 tuberculoid cases, the skin lesions were more than one in 12 cases and in the rest six it was single. There were only two maculoanaesthetic cases, in one of which the lesion was single and in the other it was multiple. The duration of the lesions varied from 1 to 30 years. It appears from the clinical examination that the duration of the disease, had no effect over the stage of the polyneuritic changes, because similar polyneuritic changes were found with dissimilar duration. Blood pressure and pulse rate of the upper extremity were recorded for the sides.

Nine cases were grouped under control study of which four cases were taken from the experimental group (unaffected side) and the rest five cases were suffering from other skin diseases.

10 ml. of Diodone (35%) was injected into the brachial artery of the affected side as quickly as possible and the films were taken immediately after injection and after about 5, 10, 30 and 50 seconds. In the beginning, only in a few cases, the injection was given successfully by the blind method (percutaneous) but as there is chance of failure, open method was followed in the most of the cases. Under local anaesthesia the brachial artery was exposed above the bend of the elbow and found lying between median nerve and tendon of the biceps brachialis. Sometimes the basilic vein was found anterior to the brachial artery when difficulty arose; usually the vein is found medial to the artery. After the injection, care was taken to stop bleeding from the punctured point and the wound was closed by a few sutures. The wound healed up and there was no complication in any case. In the beginning, just after closing the wound radial pulse was not palpable in the operated hands and signs of ischaemia were present in hands for a few hours. It was thought it might be of neurological origin: about 2 ml. novocaine 2% was therefore injected subcutaneously along the ulnar nerve. So as a routine in all cases novocaine was injected subcutaneously along the ulnar nerve.

Findings

Clinical, radiological and other data are enumerated in the table.

TABLE

Experimental Group

No.	Name, Age, Sex, religion	Duration in years	Clinical findings	Bact. Exam.	Lepro-min test	Classification	Straight X-ray	Arteriography	Remarks
1	R. S. 34 H. M.	8	Slightly erythematous lesions with raised margin over the left hand with anaesthesia and analgesia. Deformity of the Lt. hand with wasting of the muscles. Similar thick lesions over forehead, face and back. Several nerves thickened.	Neg.	+	T ₂ P ₁	Rt. and Lt. hand: No abnormality found.	Lt. hand: Arterial circulation seen upto distal phalanx. Capillary distribution at places in the distal phalanx. Tortuosity present. Venous and cutaneous distribution seen. Vascularisation abundant on thumb.	
2	B. R. 65 H. M.	1	Erythematous and raised lesions over body, chest back and extremities Sa + Da + Deformity of Lt. hand with wasting of muscles.	Neg.	+	T ₂ P ₁	Lt. hand: No bony change.	Lt. hand: Scanty visualisation upto metacarpophalangeal joints.....	
3	M. S. 60 H. M.	15	Erythematous raised lesion on the Lt. foot, Rt. leg, forehead, upper lip, back and Lt. forearm Sa + Da + Hypopigmented ill-defined lesion on Rt. hand, Lt. forearm and hand. Sa + Da + Wasting of muscles of Lt. forearm. Deformity of Lt. hand. Several nerves thickened.	Neg.	+	T ₂ P ₁	Lt. hand: Sclerosis of medulla of 2nd phalanx of th: 3rd digit.	Lt. hand: Non-visualisation of the dye in the affected 4th and 5th digit. Distribution in the terminal phalanx of the thumb seen upto 3011.	
4	M. N. 65 M. M.	2	Deformity of Lt. hand with wasting of the muscles. Erythematous raised lesion over Lt. hand, Lt. forearm. Sa + Da + Similar lesions over both feet and body Sa + Da +	Neg.	+	T ₂ P ₁	Lt. hand: medullary sclerosis of proximal phalanx of 2nd digit. Enlargement of the nutrient fordm men in the 2nd digit.	Lt. hand: Scanty vascularisation only upto metacarpophalangeal-joints. No venous pattern seen. Cutaneous circulation seen.	
5	U.N.G. 50 H. M.	1	Erythematous raised lesion on Rt. wrist, forearm and arm. Wasting of muscles of Rt. forearm and hand with loss of prominence of thenar and hypothenar eminence. Deformity of the Rt. hand. Sa + Da +	Neg.	+	T ₁ P ₁	Rt. hand: medullary sclerosis in the most of the phalanges but more so in the proximal phalanx of the 3rd digit.	Rt. hand: Abundant vascularisation both in the arterial and venous circulation less in the 5th digit. Cutaneous distribution also seen. Delay in emptying from the affected digits.	
6	M. J. 55 M. M.	4	Deformity of the Lt. hand with wasting of the muscles Lt. foot drop. Erythematous raised lesions all over the body. Sa + Da +	Neg.	+	T ₂ P ₂	Lt. hand: Medullary sclerosis in most of the proximal phalanges.	Lt. hand: Vascularisation seen mostly upto the metacarpophalangeal joints. A few venous pattern seen. Delay in the filling of affected digits. Cutaneous circulation seen.	
7	S. R. 43 H. M.	16	Hypopigmented lesions with papules over the surface of whole body Sa + Da +. Deformity of both hands with wasting of muscles. Several nerves thickened.	Neg.	+	T ₂ P ₁	Lt. hand: Absorption of terminal phalanges of Lt. thumb, ring and little finger. Rt. hand: Absorption of terminal phalanges of thumb, 4th and 5th digits. Dislocation & disorganisation of 1st inter-phalangeal joint of the 2nd digit.	Lt. hand: Vascularisation present in all the digits. Dye..... is seen in the terminal phalanges of the thumb and 5th digit upto 30". Cutaneous distribution is seen at places.	
8	M. H. 24 M. M.	3	Erythematous lesions on Rt. arm, forearm and hand. Deformity of little and ring fingers. Slight wasting of hypothenar eminence. Similar lesion on face, forehead and ears Sa + Da +. Several nerves thickened.	Neg.	+	T ₂ P ₁	Rt. hand: No Abnormality found.	Rt. hand: Non-visualisation of vessels.	
9	G. R. 40 H. M.	2	Hypopigmented lesions with thick margin on Rt. hand, forearm and arm. Similar lesions all over the body. Sa + Da +. Wasting of muscles of Rt. hand with bending of the fingers.	Neg.	+	T ₂ P ₁	Do.	Rt. hand: Scanty visualisation. No venous pattern. Circulation seen upto metacarpophalangeal joints in most of the cases. Delay in filling in the 3rd, 4th and 5th digits upto 5".	
10	S. M. 30 M. M.	10	Erythematous lesion on Rt. forearm, arm and hand. Deformity of Rt. hand with wasting of muscles Sa + Da +. Nerves thickened.	Neg.	+	T ₁₋₂ P ₁	Do.	Rt. hand: Scanty visualisation. No venous pattern seen. Delay in filling and non-visualisation of 5th digit. Cutaneous pattern seen.	
11	M. P. 42 H. M.	16	Hypopigmented lesions with raised margin over Lt. hand and forearm. Deformity and wasting. Lt. wrist drop. Wasting of muscles of the forearm. Similar lesions on nose and face. Sa + Da +.	Neg.	+	T ₂ P ₁	Lt. hand: No Abnormality found.	Lt. hand: Practically non-visualisation of the vessels.	

TABLE
Experimental Group—(Contd.)

No.	Name, Age, Sex, religion	Duration in years	Clinical findings	Bact. Exm.	Lepro-min test	Classification	Straight X-ray	Arteriography	Remarks
12	B. S. 50 H. M.	16	Hypopigmented lesions with follicles over the surface of Rt. hand. Slight deformity with wasting of muscles Sa + Da +. Rt. ulnar nerve thickened.	Neg.	+	T ₁ P ₁	Rt. hand: Absorption of terminal phalanx of the little finger.	Rt. hand: Poor visualisation in the thumb only.	
13	M. I. 25 M. M.	1	Erythematous lesions over Rt. hand and forearm. Bending of finger. Similar lesions on Rt. foot and leg. Sa + Da +	Neg.	+	T ₂ P ₁	Rt. hand: Normal appearance.	Rt. hand: Scanty visualisation upto wrist joints immediately after and upto Isinterphalangeal joints at 5". Delay in filling—non-visualisation in the thumb and 5th digit.	
14	P. S. 50 H. M.	2	Erythematous raised lesions on Lt. hand with wasting of thenar eminence. Deformity of fingers. Sa + Da +	Neg.	+	T ₁ P ₁	Lt. hand: Normal appearance.	Lt. hand: Immediate good vascularisation. Venous and capillary distribution seen in the phalanges. Cutaneous pattern also seen. No venous return upto 5". Delay in filling.	
15	S. M. 35 M. M.	11	Erythematous thick lesion over Rt. arm, forearm and hand. Deformity of the fingers with wasting of muscles. Sa + Da +	Neg.	+	T ₁ P ₁	Rt. hand: Medullary sclerosis of the middle phalanx of all digits. Spike formation of terminal phalanx of 5th digit.	Rt. hand: Both arterial and venous distribution seen nicely. Immediately after, distribution in the terminal phalanges of all digits except 5th. Cutaneous distribution seen.	
16	B. J. 16 H. M.	4	Hypopigmented lesions on Lt. hand. Deformity of the fingers with wasting of muscles. Lt ulnar nerve thickened.	Neg.	+	MA ₁ P ₁	Lt. hand: Medullary sclerosis of the middle phalanx of the 1st digit.	Lt. hand: Excellent visualisation on immediate examination. Capillary distribution of the phalanges seen. Cutaneous distribution seen nicely.	
17	M. R. 18 H. M.	3	Erythematous lesion over Lt. arm, face, body and extremities. Deformity of the Lt. hand. Nerves thickened.	Neg.	+	T ₂ P ₁	Lt. hand: Normal appearance.	Lt. hand: Vascularisation seen well only at 5". Venous and capillary distribution not so prominent. Better filling of affected 4th and 5th digit. Cutaneous distribution seen.	
18	G.G.D. 20 H. M.	6	Hypopigmented lesion with erythematous margin over Lt. arm, forearm and hand. Deformity of fingers with wasting of muscles. Similar lesions over Rt. thigh and face.	Neg.	+	T ₂ P ₁	Lt. hand: Destruction of terminal phalanx of the 3rd digit. Sclerosis of the terminal phalanx of the 4th digit.	Lt. hand: Vascularisation seen upto metacarpophalangeal joint of the 4th digit. Quick emptying of vessels.	
19	A.A.K. 60 M. M.	30	Hypopigmented lesions almost all over the body Sa + Da +. Bending of all the fingers. Wasting of thenar and hypothenar muscles.	Neg.	+	MA ₂ P ₁	Rt. hand: Clubbing of the 3rd metacarpal bone.	Rt. hand: Vascularisation seen upto metacarpophalangeal joints. Better visualisation at 5" except the affected 5th digit.	
20	B. K. 13 H. M.	2	Erythematous raised lesion on Lt. hand and forearm and buttock. Wasting of the muscles of the Lt. hand. Slight deformity seen Lt. ulnar nerve thickened.	Neg.	+	T ₁ P ₁	Lt. hand: Normal appearance.	Lt. hand: Visualisation seen upto terminal phalanx. Venous return seen. Cutaneous vessels seen at places.	

CONTROL GROUP

Serial No.	Name	Diagnosis	Arteriography of the hand
1	A. K. D. 18 H. M.	Hyperhydrosis	...
2	S. T. 40 H. M.	Psoriasis	...
3	D. P. C. 17 H. M.	Ainham	...
4	M. S. 45 H. M.	Leucoderma	...
5	S.	Ringworm	...
6	R. S. (Exp. 1)	Leprosy	...
7	U. N. G. (Exp. 5)	Leprosy	...
8	M. P. (Exp. 11)	Leprosy	...
9	P. S. (Exp. 14)	Leprosy	...

Vascularisation seen. Partial emptying by 5".

Non-Visualisation of the vessels.

Imperfect visualisation but seen better at 5".

Vascularisation seen only partially. Emptying within 5".

Visualisation upto metacarpophalangeal joint. Venous and cutaneous distribution seen, better at 5".

Delay in filling distribution upto the middle phalanges. Scanty visualisation. Venous part of the circulation not seen.

Non-visualisation.

Imperfect visualisation. Arterial distribution in the thumb seen. Better seen at 5".

Venous formation and cutaneous distribution seen. Visualisation fair.

Discussion

Barnetson (1950) by oscillometric studies found no evidence of occlusion of the larger vessels, but by skin temperature test he found a failure of reflex dilatation of vessels in leprosy patient's skin when the opposite side was immersed in hot water. This findings of failure of reflex action was also observed by capillaroscopic studies of Komatsu (1937). With the help of thermocouple and light trace galvanometer, Chatterjee (1959) showed lowered temperature over the anaesthetic area, but Fritschi (1959) found no difference of temperature between the anaesthetic and non-anaesthetic areas.

Faget & Mayoral (1944) concluded from arteriographic study that arterial circulation of the extremities is not materially disturbed in non-lepromatous leprosy. There seemed to be no causal relationship between the arterial supply of hands and feet and the degree of neurotrophic bone absorption.

Paterson (1955) is of the opinion that there is no evidence of any primary vascular factor responsible for the bony changes in leprosy.

The narrowing of the arteries found in rheumatoid arthritis by Leb (1952) was also found in a few cases by Paterson (1955) where there had been soft tissue absorption, but dilatation of digital arteries in the presence of local non-specific infection and resulting venous engorgement-occurred.

Leither (1938) observed no change in the vessels on arteriography in three leprosy

cases. In our series, violent spasm of the arteries has been noticed in almost all the cases including the controls. The cause of the spasm could be attributed to the drug as this was absent in cases where normal saline solution was injected as a control. Seven patients showed diminished pulsation of the radial artery and also blackening of the finger nails, and in one case the loss of colour continued upto 24 hours. It may be noted that the normal circulation time is about 12 sec. for the upper extremity. Comparatively better distribution of the dye was seen in the thumb in 11 cases - 9 affected and 2 non-affected. There was good visualisation in 22 - 17 affected and 5 non-affected, partial in 3 - 1 affected and 2 non-affected. The cause of non-visualisation was probably due to technical error. 2 cases with a history of 15 and 4 years' duration with affection of the 1st, 4th & 5th digits showed a stasis of the dye in the thumb at 30 sec. (Figs. 1 & 2) and non-visualisation of the dye in the 4th & 5th digits (Case Nos. 3 & 16) Another 2 cases with a duration of 10 & 11 years showed a crowding of the vascular shadows in the terminal phalanges of the thumb at 5 Sec. (Case Nos. 10 & 15).

In 1 case with a history of 16 years, where the straight X-ray showed absorption of the 1st & 5th digits, Arteriographs showed thinning of the digital vessels (Fig. 3) and delayed emptying when compared with the healthy digits (Fig. 4) (Case No. 7). Most of the cases showed a good filling at 5 sec. (Fig. 5). In seven of the control, the digital vessels did not fill so well because of the arterial spasm and there was a shunt (Fig. 6) and there was no visualisation in two.

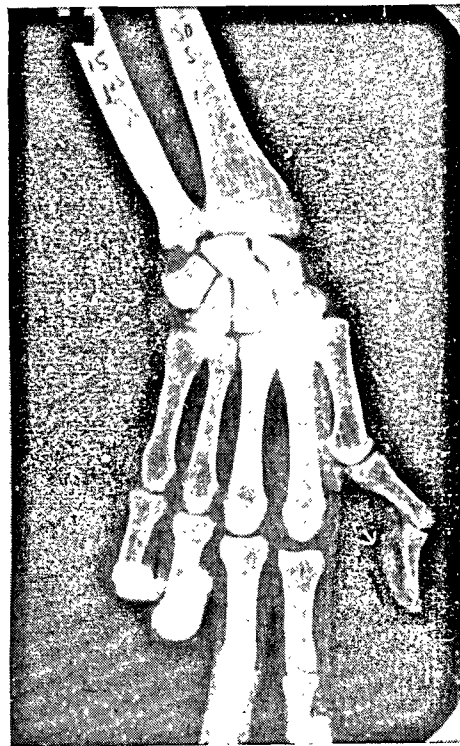


Fig. 1



Fig. 2



Fig. 3



Fig. 4



Fig. 5



Fig. 6

Summary

Arteriography was done of the affected upper extremity of 20 cases of leprosy of non-lepromatous type to note any change in the haemodynamics. 9 cases were used as control consisting of 4 cases of leprosy with unaffected upper extremities and 5 cases of other skin conditions. Vascular

changes noticed were in the form of a circulatory stasis in the digits. Stasis was not dependent on the duration of the disease. In case with associated bone absorption, the vessels appeared thinner, and there was delay in emptying due to venous stasis. A shunt was noticed in most of the control cases producing a poor filling of the digital vessels.

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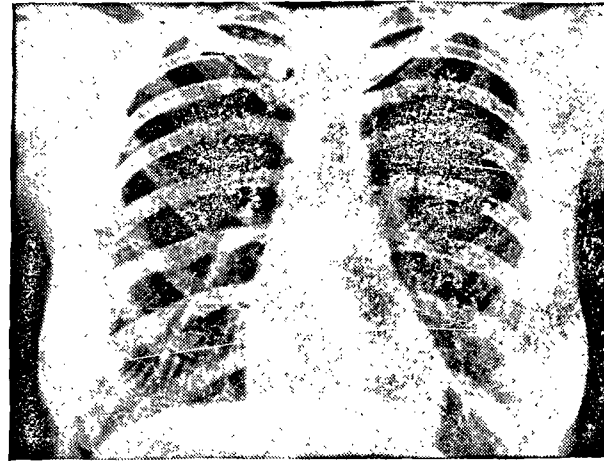
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A case of bilateral pre-pelvic formation of the Upper calyx of the Kidneys

BY

Dr. BHARAT BHUSHAN, B.Sc., M.D., D.M.R.E.,

Head of the Department of Radiology, Gandhi Medical College, Bhopal, M.P.

Introduction

Congenital anomalies of the urinary apparatus are not unusual though somewhat rare. The urinary apparatus showing congenital anomalies is important both from the clinical as well as Radiological point of view. In the former case, anomaly makes itself clinically manifest sooner or later by exhibiting symptoms of disease. Radiologically the system is easy of approach and observation by virtue of many Radio-Opaque media being excreted through this route and this rendering the system visible to the naked eye.

The congenital anomalies lead frequently to complications in drainage, calculus formation or secondary effects of obstruction, thus forcing the patient as well as the clinician to look for them and detect them.

Development

The functioning human ureter and kidney is developed from two components, (*i.e.*) the collecting component and the secretory component. The former arises from the metanephric bud or the so-called ureteric bud arising from the Wolfian duct, and the latter from the mesenchymal mass of mesodermal origin. The ureteral bud grows upwards and backwards, towards the mesenchymal mass. It then dilates to form the pelvis, the latter

then dividing into two major calyces from which arise the minor calyces. These then unite with the mesenchymal components which form the secretory part. Therefore it is quite possible for nature to overshoot or retard the pace of development and lead to one or the other form of abnormality.

In such a development the occurrence of double ureter or a double pelvis is quite possible, because this bifurcation might take place a little too lower down, before reaching the secretory component.

Another possibility is an early formation of one of the major calyces but a pre-pelvis separation of one of the calyces should be regarded as an abortive attempt in the pace of abnormal development to form a double ureter.

For this developmental accident to happen and that too bilaterally is clinically interesting. Such a case happened to come under my observation.

Case Report

Patient, Mansingh, Hindu Male, aged 45 years was admitted on 24-4-60 to Hamidia Hospital with the complaints of pain on the right side of the back and right lumbar region, shooting down to the penis, of one days duration. The pain was mild. There was no trouble with micturition.

Past History.—Five years back he had two such attacks.

Family History.—Nothing - unusual.

Examination.—On physical examination nothing positive was detected.

Investigations

Urine.—Colour - Pale yellow, Reaction - Acid, Sp. Gravity-1013, Albumen - Fine traces; Sugar - Nil - Pus - cells - Occasional, R.B.C. - Present in fair numbers.

Blood examination.—Total R. B. C. - 4.7 Million; Hb. - 90%; Total W. B. C. Count - 9100; Polys - 71%, Lymphos - 26%, Eosinophils - 3%, Basophils and Large - monos - Nil.

Radiogram.—Plain - nothing abnormal was detected.

Intravenous - Pyelogram

Plate No. I.—Showed bilateral pre-pelvic formation of the upper calyx on both sides. The upper calyx on the right side runs a course medial to the pelvis and is seen merging with the ureter distal to the pelvi-ureteric junction. The same condition exists on the left side.

Plate No. II.—There is no evidence of continuation of duplicate ureter on either sides.

Discussion

That such a condition could co-exist with the presence of a separate functioning renal unit at the upper pole is not probable as its drainage duct does not run a complete course along with the ureter, like the two parallel rails of a railway line. Even if such a

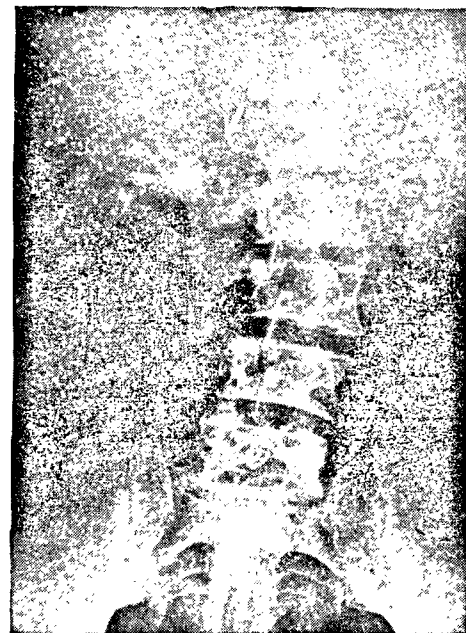


Plate I



Plate II

separate renal unit was existent, either in the form of a lobe or a duplicate kidney, has not been demonstrated radiologically and has not been verified by surgery.

That the presence of symptoms which were mild was not due to any other pathological lesion is established by the absence of any other abnormal Radio-opaque shadow like that of a calculus, and by the absence of evidence of any other kind. The probabilities are that either the symptoms are accounted for by this congenitally abnormal pre-pelvic separation of the upper calyx causing faulty drainage, or it is only coincident irritation of the urinary passes due to crystal-uria (*vide* the urine report).

Summary

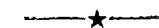
1. An unusual case of pre-pelvic formation of the upper calyx has been reported.
2. The condition was present bilaterally symmetrically.
3. There is no evidence of re-duplication of the ureters.

Acknowledgments

My thanks are due to Dr. R. P. Singh, M.S., Principal, Gandhi Medical College, Bhopal for his kind permission to report this case.

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Trichobezoar

(A rare clinical and Radiology entity)

BY

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Assistant Medical Officer (Radiology), Central Railway Hospital, Byculla, Bombay.

A female child aged 13 years was undergoing treatment outside for weakness, loss of appetite, vomiting off and on. These symptoms dated over eight months. Patient attended the Central Railway Hospital, Byculla, in the first week of August, 1960.

2. Clinical examination revealed that the patient was ill-nourished and appeared pale. Patient was afebrile. Heart sounds were normal and lungs clinically clear.

Alimentary System

Inspection.—Apparent swelling in the left hypo-chondriac region.

Palpation.—Swelling, hard, mobile intra-abdominal, margins well defined, size

6' × 3", 'J' shaped, not tender, extending from below the left costal margin, towards Epigastric and umbilical region.

3. Patient was investigated as a routine for Splenomegaly. Subsequent clinical examination disclosed that spleen could be palpated independent of this intra-abdominal tumour.

Laboratory Investigations.—Blood Picture - Hb - 80 per cent. R.B.C. count - 41,00,000 per cmm. Total leucocytes - 12,000 per cmm. Urine and stool - Nil abnormal detected.

4. Plain X-ray of abdomen in erect position showed distorted appearance of air bubble in the stomach with ? margin of

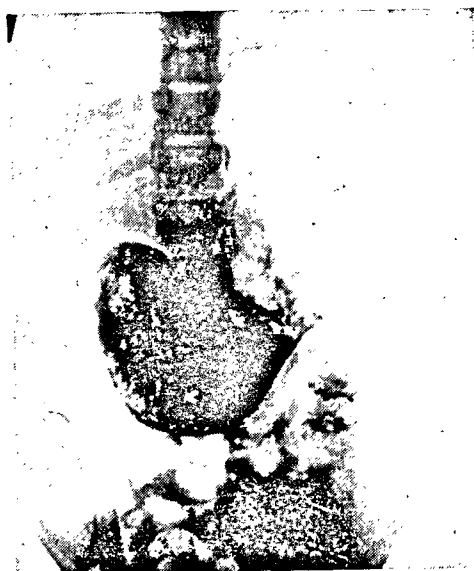


Fig. 1
Stomach 5 mts. after Ba. meal Erect.



Fig. 2
Stomach 1 hour after Ba. meal Erect.

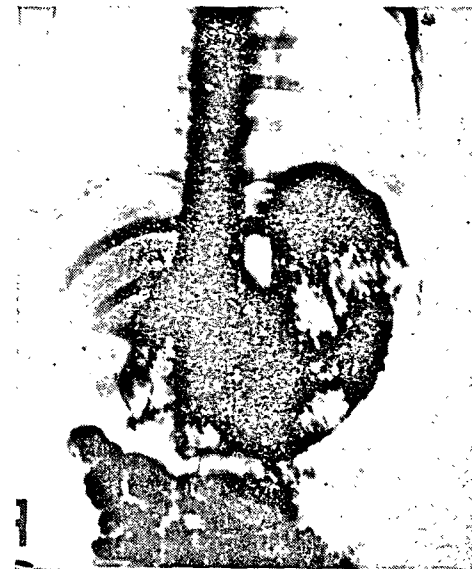


Fig. 3
Stomach 1 hour after Ba. meal (Prone position).

tumour protruding. X-ray after Barium meal in erect position showed upper margin of tumour protruding in the stomach air bubble. Subsequent X-ray in prone position disclosed that filling defect in stomach had assumed contour of stomach. When stomach had substantially emptied, X-ray revealed a filling defect - (due to hair ball) assuming mottled blotched appearance. Therefore tentative radiological diagnosis of Trichobezoar - Hair ball in stomach - was made.

5. Parents later gave history that the child was in the habit of swallowing her own hair and pieces of thread for some years in early childhood.

6. Patient was admitted in hospital on 22-8-1960 and operated on 25-8-1960 when gastrotomy was done and hair ball weighing 13 ozs. was taken out. The patient had no post-operative complications, looked more cheerful and healthy on discharge from hospital 12 days after the operation.



Fig. 4
Trichobezoar.

7. Besides, Trichobezoar - it is reported that Shellac Bezoar results from drinking solutions of Shellac as intoxicant. The alcohol is absorbed by gastric mucus and Shellac remains in stomach. Persimmon Bezoar is formed by the accumulation of fibres of Persimmon fruit giving X-ray characteristics of Trichobezoar.

8. Trichobezoar is a rare clinical and radiological entity. Very few specimens occupy the shelves of pathological museums.

(I am grateful to Dr. R. C. Vevaina, Chief Medical Officer, Dr. S. P. Pednekar, District Medical Officer, and Dr. J. K. Metha, Hon. Physician, for helping me to publish this case report).



Dr. N. B. ROY
CALCUTTA

President, Indian Radiological Association, 1960

Presidential Address*

BY

Dr. N. B. ROY, Calcutta,

President, Indian Radiological Association, 1960.

Your Excellency, Hon'ble Sri Sanjivaya, Chairman and members of the Reception Committee, our Guest Speaker Dr. Khanolkar, Distinguished Visitors, Fellow Delegates, Ladies and Gentlemen—

At the very outset, I must express my gratefulness to my colleagues in Radiology for having elected me as the President of the Association for the current year and thus having given me the opportunity to preside over the deliberations of the 14th Indian Congress of Radiology at Hyderabad. This is the highest honour that the Association can bestow on one of its members and I often wonder if affection had not dominated over discretion in the matter of their choice. While I am fully conscious of the honour and responsibility associated with this high office, I must confess that I feel very humble at the same time when I think of my distinguished predecessors in office, men who were really giants in the field of Indian Radiology. As a humble soldier fighting for the cause of Radiology, I would like to assure you friends that I shall exert myself to the utmost to be worthy of the trust and confidence you have reposed in me and, with your help and co-operation and with the blessings of my distinguished predecessors whose examples will serve as guiding stars in our voyage through stormy waters, we will continue to struggle for the betterment of our Association and the art and science of Radiology.

Your Excellency, Hon'ble Sri Sanjivaya, this is the first time that the Indian Radiological Association is holding its Annual Congress in the State of Andhra Pradesh and may I, on behalf of the organisers and authorities of the Congress, have the pleasure and the privilege to offer to you, Sri Sanjivaya, our heartfelt and sincere thanks for having found time, in the midst of your numerous and pressing engagements, to inaugurate the 14th Indian Congress of Radiology at Hyderabad. Your personal presence in our midst and the inauguration of this Congress by your dynamic personality is sure to give impetus and tone to the deliberations of this Conference which will prove of great value to the Science of Radiology and the public at large.

To you, Dr. Khanolkar, I would like to express, both on behalf of the Association and on my personal behalf, our gratefulness and our appreciation for having accepted the Sir Jagadish Bose Memorial lectureship at a very short notice. It is indeed a unique privilege for us, that a man of the eminence of the President-elect of the International Cancer Congress to be held at Moscow in 1962 has taken the trouble, at great personal sacrifice, to come over to Hyderabad and deliver the memorial lecture in person.

It seems, to me, on an occasion like this, that we pause for a moment and reflect on the enormous strides our beloved Science of

*Fourteenth Indian Congress of Radiology, Hyderabad, 1960.

Radiology has made within its short span of life.

Friends, let us for a moment turn back the pages of history to a cold November evening of 1895 when a renowned scientist, Roentgen by name, while carrying on some experiments in his laboratory suddenly discovered some then unknown rays which he termed X-rays, and within seven weeks of that discovery, the world was startled by the news of these penetrating rays, called X-rays or after the name of the discoverer, Roentgen rays.

Almost at the same time, a young scientist with the help of her husband, was working hard in trying to isolate Radium from Uranium. She was brilliant, she was beautiful, she was poor, but she was mad after science. This young lady was Marie Sklodowska Curie. Working as a governess in the early part of her career, this poor woman saved some money and with those meagre savings she started her university studies. Many a time, she could not afford even two square meals a day, many a time she even fainted in the laboratory from starvation, but unperturbed she continued with her studies and researches. For the sake of science, she had staked everything. While carrying on experiments for the discovery of Radium, she had to keep the oven burning. Sometimes, she had no money to buy any wood but she and her Professor husband used even their household furniture as fuel for the oven. Her toil was not in vain. The world was startled by an announcement in December 1898 from Paris Academy of Science—the discovery of Radium by Madame Curie.

Almost as soon as the X-rays were discovered, their practical applications in medicine were realised. In the field of Radio-diagnosis, in those early days, Radiology was almost entirely confined to the

shadow of bones and the search for foreign bodies. In beetle-infested basements, those early pioneers continued to develop newer and newer techniques of Radiography, until radiology permeated practically every branch of medicine and became one of its greatest diagnostic aid. From the days of old-gas-tubes, Mercury-breaks and Induction-coil we see to-day the introduction of the Image-intensifier, Photo-fluorography, Automatic rapid serial changers and High-voltage radiography. From the mere shadow of bones in those early days we have come to a phase where modern medicine and surgery would cease to exist without the help of diagnostic radiology. The developments to-day in Neuro-radiology, Angiocardiography, Cerebral Angiography, Cinematography, Aorto and Spleno-graphy have come to a stage of almost technical perfection. From what I have seen at Munich in July last year at the 9th International Congress of Radiology, I can confidently say that in the field of design of apparatus of Diagnostic Radiology, our colleagues, the X-ray Engineers are not lagging behind but have even gone ahead of us.

In the field of Radiotherapy, very soon after the birth of X-rays, scientists in Chicago, Germany and France began to experiment on Cancer. Since then several persons attempted the use of X-rays in cancer and in skin diseases rather empirically. For the first twenty years, only minor improvements occurred. In 1920, Seitz and Wintz of Ernalgen introduced 200 K.V. deep therapy and since that time the conception of radical therapy *i.e.* radiotherapy with the object of effecting a cure came into picture. The next forty years saw immense improvements in the fields of Dosimetry, design of apparatus and technical methods and introduction of supervoltage therapy, particle therapy and isotope therapy.

Radium therapy came into the picture in a funny way. A famous scientist, Henry Becquerel sustained a burn on the skin of his abdomen by carrying a tiny tube of radium in his waistcoat pocket. A French dermatologist recognised the burn as similar to X-ray burn and suggested that radium might be used therapeutically and since then radium is being used in the treatment of cancer. Tremendous improvements have taken place since then and radium therapy is to-day no longer an empiricism but a precise science where accurate and homogeneous distribution of dosage is possible. To-day one can use perspex and plastic moulds in superficial growths and some types of lesions in the mouth. We can accurately plan a radium implant in the tongue or a radon-seed implant in the bladder and know the exact dosage delivered by a post operative radiographic check-up. In fact advances have occurred in every field of radium therapy—whether mould or implant, whether intra-cavitary or tele-radium.

Science marches on. Researches proceed. Further improvements occur. We see the introduction of supervoltage therapy. We notice one to two m.e.v. X-ray machines in several radiotherapy centres, we find four to eight m.e.v. linear accelerators, then Betatrons from fifteen m.e.v. to twenty four m.e.v. ranges and finally synchrotron. A seventy m.e.v. synchrotron installed at the University of California, San Francisco, is perhaps the most powerful apparatus used for the treatment of cancer to-day.

Isotopes have also entered the field of cancer therapy. To-day, Caesium or Cobalt Beams are being extensively used in cancer therapy. Even in India to-day, several Cobalt Beams have been installed under the Colombo Plan.

My friends, if Radiology has advanced thus far from 1895 to 1960, what further

progress you would anticipate in the next 35 years. What would be the state of affairs when we celebrate the centenary of the birth of X-rays? Almost in the words of Dr. Ralston Paterson, my revered teacher and President of the Sixth International Congress of Radiology, I would like to say—

In an imaginative mood, I like to encourage the fantasy that somewhere in this hall to-day there sits the young man—or the young woman—who, in 1995, will be wearing this chain of office—perhaps again in this very hall. You, whoever you are, may be summarising the advances made since that almost forgotten far-off day of 1960, when you were present at your first National Congress at Hyderabad. I can hear you saying: "Let's turn back the pages of history to 1960. How slow, how groping was their diagnosis; how primitive their therapy. What a contrast with 1995!"

Distinguished guests, I do hope you will kindly pardon me if I talk for a few minutes about ourselves. I would like to give a very brief review of the career of the Indian Radiological Association, its birth, its growth, its achievements. Twenty-nine years ago, on the 2nd of February 1931, on a misty evening, the idea of starting an Association of Radiologists in India came in the minds of two of our stalwart friends of Bengal and, within fifteen days, on the 17th of February 1931, the Association was founded. In 1932, the first Indian Congress of Radiology was held at the Calcutta Town Hall under the Presidentship of Dr. M. D. Joshi of Bombay. In October 1945, the headquarters of the Association was transferred to Madras and our journal was started in 1947. We shifted the centre again to Bombay in 1950 and for a number of years, the Association grew from strength to strength. The headquarters was again

shifted in 1957 to Delhi and the journal to Madras in the very same year. Since the Jagadish Bose Memorial lecture was founded, we have been honoured by the presence in our midst of three famous Radiologists from abroad—Dr. Elis Berven, Dr. Ross Golden, Dr. Cochrane Shanks. Our tributes to them for delivery of the memorial lecture in person at considerable sacrifice. Our present position is encouraging. Numerical strength of members is gradually increasing. Our journal is appreciated by many notable personalities and is read with interest in many parts of the world. In 1948, our Association was officially recognised by the Government of India and we were invited to forward our views on certain pressing problems. Since 1950, we have been sending National delegations from India at every International Congress—London, Copenhagen, Mexico, Munich. In fact, India is now on the map of world Radiology.

The most important task facing the Radiologists of India to-day is provision of Radiological service to nation. And the two most important factors in this service are—(1) Man-power—both medical and technical and (2) Apparatus and equipments. I emphasise at the very outset that the service to nation must be a quality service and no consideration should be allowed to stand in the way.

We have to provide two different types of Radiological Service to the people—namely—Radiodiagnostic service and Radiotherapy service.

Radio-diagnostic service should have a decentralised pattern, the service extending to the villages as well. Whereas the teaching centres should be well equipped and well staffed with Radio-diagnosticians of very high calibre, the nature and scope of service and therefore of equipments and staffing may be progressively reduced as we

proceed peripherally from teaching centres in cities to district and Sub-divisional towns and villages.

The most important feature, in the organisational pattern of Radiotherapy service, is centralisation—with provision of peripheral clinics—serving as cancer detection centres and linked with the central institute. There are two main reasons for this. The first is scientific—a central institute affords facilities and opportunities for better treatment, better training and better research. At such a centre where costly equipments and trained personnel are concentrated, sufficient numbers of patients of each cancer type seen every year and different technical methods can be studied and compared. This increases experience with inevitable improvement of treatment results. Facilities of training and research are also much better than in small, isolated clinics because of the possibilities of investigating and studying large groups of cases. That centralisation alone can cause a marked difference in the treatment results has been amply demonstrated by the results achieved at such centres as Radiumhemmet of Stockholm, Fondation Curie of Paris, Memorial Hospital of New York, Holt Radium Institute of Manchester and others. A second reason of centralisation is economy. The funds required for the purchase and maintenance of equipment and remuneration of trained personnel at a number of special institutes are considerably greater than the costs of running a single, large, central institute. Such a central Institute would be ideal especially in India where financial resources are definitely more limited.

May I, therefore, from this platform, put forward a suggestion to the Government of India for the solution of the cancer problem of the country. I would urge the creation

of a limited number of centralised Radiotherapy Institutes with a large number of peripheral clinics, serving as cancer detection centres, linked with each central institute. Such central institutes should be adequately staffed and adequately equipped and distributed throughout India. A large number of centres to respect geographical necessities can hardly be well-equipped and well-staffed in view of the heavy financial demands, and, therefore, leads to hazardous and unscientific treatment to the ultimate harm of the public. Particularly for India with limited financial resources this is a very vital consideration and, I hope, that our enthusiasm for geographical consideration will not blind the administration to this fundamental principle. In this connection I would praise the people of Hyderabad for establishing a Cancer Institute and it is my earnest hope that this will serve as a centralised Radiotherapy Institute. I would recommend, however, that a number of peripheral clinics be created in and around Hyderabad to be linked with this central institute.

Let me now touch briefly on two important aspects of the Radiological service to nation—namely, man-power and equipment. Medical man-power forms the most important single factor in the Radiological service to nation. I would like to stress once again that the quality of the man behind the machine is of paramount importance in the diagnosis and treatment of disease and request the administrators to kindly take note of this. Mere distribution of high-voltage machineries and Cobalt Beams to odd places, on political considerations alone, without caring to investigate whether competent and experienced personnel capable of utilising them are available is likely to cause more harm than good to the people. Our administrators and policy makers should not forget that these are

double-edged weapons and the interest of the people demands that these are handled carefully by qualified and experienced men and not by any Tom, Dick and Harry who presses the button and hopes for the best. In the problem of medical man-power we, the teachers in Radiology can not avoid our responsibilities of imparting proper training. In the under-graduate course, training in the basic essentials are necessary. Diagnostic radiology should be taught throughout the preclinical and clinical courses so that the students get an idea of the normal radiological appearances and how Radiology can be a good diagnostic aid to practically every branch of medical speciality. Radiotherapy should be taught in the final year of M.B., B.S. course and the teaching should be illustrated with demonstrations so that the students know that cancer is no longer an incurable disease, if treated early, that a cure-rate of more than 80% is possible, except at certain sites, provided early diagnosis is made and provided a judicious combination of surgery and meticulous radiotherapy is carried out. In the Post-graduate training, the first fundamental is the separation of Radio-diagnosis and Radiotherapy for purposes of training practice. Each branch of Radiology has made such a phenomenal progress during recent years that it is no longer possible for one and the same man to practise both branches of Radiology with equal efficiency. The Post-graduate trainee, therefore, should at the very onset select one branch of Radiology and quality training should be imparted to him. The country, however, needs more Radio-diagnosticians than Radiotherapists as the pattern of Diagnostic Radiology is one of decentralisation, the service extending even to the villages. In imparting the training, therefore, the consideration should be given to the relative proportion of trainees to each branch. As necessarily the practice of

radiology will also be completely separate in the future set-up of the country, I would insist that the quality of training imparted be of the highest order.

I would recommend—

1. Initially, one year's Post-graduate experience, including at least six month's training as House Physician or House Surgeon in the General Medical and/or Surgical wards of a recognised Hospital.
2. After this pre-admission requisite, the candidates will be admitted to two-year Diploma course either in Radio-diagnosis or in Radiotherapy. When the students have obtained either D.M.R.D. or D.M.R.T., they can set up in private practice if they so desire or they can accept service. After a couple of years' further experience and working as a Registrar in a teaching institution under supervision, these boys can appear for a higher examination such as—
3. M.D.—either in Radio-diagnosis or in Radiotherapy.

After obtaining M.D. they can be eligible for higher independent appointments in teaching institutions.

I might be asked why I insist on such high standard when the status of Radiologists and the remuneration offered is not what is expected. It is my strong conviction that if we radiologists raise our own standards, we must obtain the status and the remuneration which is our due. I would strongly urge all administrators and policy makers—whether Government or non-Government—to remember the contributions of modern radiology to medical science and to accord to us the status and remuneration which is our due and at least on a par with our other medical colleagues.

In addition, I would recommend short refresher courses for radiologists at our teaching institutions and also for General Practitioners to show them the value of modern Radiology.

Training should also include non-medical personnel. We need Physicists, Radiographers and different types of Technicians. There is a tremendous dearth of non-medical technical personnel in Radiology and I would strongly recommend the creation of a Central school of Radiography, where boys and girls from all over India, on the basis of stipends similar to the Nursing profession, can be adequately trained and, following the training be absorbed in suitable jobs in institutions all over India.

I now come to the second important factor in the Radiological service to the nation—namely apparatus and equipments. It is common knowledge that our colleagues, the X-ray Engineers, are going even ahead of us with their researches and producing better and better equipments for the welfare of humanity. That brings us to another vital point—the cost. The cost of the machineries has increased so much that it is practically beyond the scope of any private individual. We have, therefore, to meet and discuss how the cost can be reduced. The cost can only be reduced if we manufacture our equipments in our country. I would congratulate the Government of India in moving in the right direction and already three firms have got licences for manufacturing X-ray equipments in India in collaboration with established and experienced foreign manufacturers. As this is a highly complex industry, the programme of development has necessarily to be a phased one. Quite a number of components such as Tubes, H.T. Cables, etc. have got to be imported for a

very long time and the manufacture of these can be introduced at a later day. May I, therefore, request the Government of India and the State Governments to reduce the high Customs' Duty on imported X-ray apparatus and accessories and X-ray films and chemicals and exempt them from the operations of Sales Tax. These taxations have considerably increased the cost of our requirements and, thereby, the cost of the Radiological service to the nation. To give service to the people, to relieve their sufferings, it is imperative that the authorities reduce the cost of our equipments until such time as India is able to manufacture her own needs. May I also request the Government to kindly raise the ceiling of rebate on the price of X-ray and other appliances necessary for equipping a clinic by a Radiologist while calculating his assets for the purpose of determination of wealth Tax and Death Duties.

I would now touch on a very important problem affecting not only the present day population of India but also generations yet unborn. With the increasing requirements of Radiodiagnostic services throughout the country and the imperative need of establishing more cancer centres, it is inevitable that the people of our country will be subjected to more and more Radiation. Certain amount of radiation-hazards is thus inevitable and posterity will never excuse us if we fail to adopt measures which will not only protect the present population but which will also ensure that genetic changes due to radiations and consequent effects such as congenital abnormalities, monster-formation, idiocy and a general deterioration of mental faculties are reduced to the minimum. Protection is, therefore, necessary from radiation-hazards to the workers, to the patients and also to the general public. To reduce these radiation-hazards to the minimum, the Indian

Radiological Association has demanded for legislative measures to control the purchase of radiation-equipments and to restrict the practice of radiology to people trained and qualified in this branch of Science and enforce the recommendations of the International Commission on Radiological protection. You need a licence to drive a car, you need a licence to keep a gun, you need a licence even to operate a Radio. But no licence is needed to purchase an X-ray equipment or operate an X-ray machine. Many non-medical men and many medical men without any training whatsoever are practising this art with considerable harm to the general public. The Indian Radiological Association seeks the help and co-operation from all right-thinking people to ensure smooth passage of Radiology Bill through Parliament. Even the I.M.A. has stated in its editorial of July the 16th—"It is imperative that uncontrolled, unsound and ill-planned installations of unnecessary sources of Radiation whether experimental, diagnostic or therapeutic, must be abolished. An All-India body may immediately be set up by the Health Ministry with the help of the I.M.A. to supervise the designing and lay-out of installations and to check whether adequate protective measures have been taken and are being followed. The body must also see that it is only the qualified who are allowed to instal and run an X-ray apparatus." I would once again draw the attention of the Government of India to the imperative necessity of passing the Radiology Bill.

I would now embark on a very pleasant task. On behalf of the Indian Radiological Association and on my personal behalf, may I offer our very sincere thanks to our hosts, Dr. Rao, Dr. Jabbar, Dr. Syed Ali and to their team of workers for having given us the opportunity of meeting at Hyderabad and for the wonderful reception

and hospitality. I would also thank the distinguished guests who have taken the trouble of coming over to this function. It has been a privilege to have you with us this morning and we deeply appreciate the interest taken by you in this Congress. To my fellow-delegates who have come over from different parts of India to attend the Congress, I would extend my grateful appreciation. You have made sacrifices for the cause of Science, you have taken pains to join in the deliberations of the Conference for the advancement of Radiology and for the benefit of humanity. During the Conference, in between the different sessions, would you make it a point to make as many contacts as possible. Do not wait for introductions. Your membership badges are good enough. You have something to tell others—they have much to tell you. In the process, you will make friendships which you will always treasure. I would particularly request you to meet our brother colleagues—the X'ray Engineers. They have taken much trouble in coming over to Hyderabad, in exhibiting their equipments. They are our friend, philosopher and guide. Without them, we can not serve the people. Without us, they do not exist. These contacts will be to our mutual benefit and together we will work for the benefit of humanity. May this Conference be the fore-runner of a new chapter in the history of Radiology and may we be granted the

strength and the will to carry on our dreams and ideals for the welfare of humanity. In conclusion, I want to emphasise, again that we the Radiologists, the X'ray Engineers and the Physicists must take up the challenge facing us to-day. The history of the last sixty years is encouraging enough. Ever since the birth of X'rays in the almost forgotten far-off day of 1895, this young science has achieved great progress and since the atomic explosions at Hiroshima and Nagashaki, the progress has been really remarkable. Like soldiers on the battle field, we shall fight against disease by mobilising all our resources, with "Heart within and God overhead". May be we will succeed, may be we will not. But even if we fail, we shall at least have the satisfaction of establishing forward camps from which our succeeding generation will start afresh to improve the Science of Radiology and to fight against cancer.

I would conclude by quoting the following lines:

"It is weary, watching wave by wave
And yet the tide heaves onward
We climb, like coral, grave by grave
That have a pathway sunward.
We are driven back for our next fray
A newer strength to borrow
And where the vanguard camps to-day
The rear shall rest to-morrow".

Abstracts of Radiological Literature

M. H. Nathan, Diagnosis of oesophageal varices by a new radiologic method, Preliminary report, Radiology, Nov. 1959, Vol. 73, 725-732.

Prophylactic surgery for oesophageal varices prior to haemorrhage is being seriously considered as the proper method of management, so early diagnosis of varices has become more important.

There are 3 acceptable antemortem methods of diagnosis. Oesophagoscopy offers the most accurate method, it has a mortality rate of 0.5 per cent. Many physicians are reluctant to use the procedure in presence of varices, besides patients refuse to undergo examination. Percutaneous splenoportography enjoys only a limited use in the United States, and is no more accurate than conventional x-ray examination of the oesophagus. 3rd method is conventional roentgen examination, of the oesophagus. Its advantages are absence of associated mortality, and ease of application. The disadvantage is its low percentage of accuracy. Valsalva and Muller manoeuvres were employed, suspended respiration in supine, prone and Trendelenberg's positions were utilised. Thick and thin barium swallows were used. Of these the greatest importance in diagnosis of oesophageal varices is the use of multiple films, since the visibility changes from one moment to the next.

A new method, employing compression of the oesophageal walls by an inflated balloon has improved the demonstration of oesophageal varices, and has proved not only in establishing the presence of varices, but also in excluding the presence of varices which may be suspected from the conventional x-ray examination. A double lumen

tube with an inflated balloon was passed through the nose to a point immediately below the junction of the middle and distal thirds of the oesophagus and was distended with air. Barium is next instilled through the tube into the distal oesophagus below the balloon, and spot films are made with the patient 15 degrees left posterior oblique, 15 degrees right anterior oblique and 60 degrees right posterior oblique while in horizontal position.

27 examinations were performed by this technic on 24 cases. The presence of varices was confirmed in 5 cases, and their absence in 5 cases. In 14 cases surgery was not performed and there was no follow up. No false positive results have been obtained with this method, and in a few instances, oesophageal varices suspected on routine examination were ruled out by using the "Balloon technic". 8 cases are reported in detail, and 3 cases are illustrated.

9 radiographs, 2 figures.

S. N. Deboo, Bombay.

George T. Wohl and Leah Shore, Lesions of the cardiac end of the stomach simulating carcinoma, Am. Jour Roentgenol, Dec. 1959, Vol. 82, 1048-1057.

Many lesions may simulate neoplasm of the cardiac end of stomach. In this presentation the authors discuss the difficulty to adequately demonstrate this region and mention briefly various techniques.

The normal space between the superior margin of the diaphragm and the air-distended cardiac end of the stomach varies between 5-15 mms. An increase in this space can be due to pathology, but may be

the result of incomplete distention of a normal cardiac end of stomach. A mass lesion hidden in a roentgenogram of this region filled with barium should be seen by an exposure of the cardiac end of stomach in the erect position. This must be part of every routine examination. If a mass is suspected and the air swallowed is little, a technique which allows the patient to suck barium through a straw, in which a hole is punctured through its proximal end, allows air to enter with barium. Effervescent powders and carbonated drinks may be used.

In attempting to classify lesions of the cardiac end of the stomach, simulating carcinoma, there are 3 groups. First is the normal variants. The second is the intrinsic benign gastric lesion. Third is pressure deformity. The intrinsic benign lesions are giant rugae, gastric varices, benign tumours esp. polypi, diverticulae, postoperative deformities intussusception of the oesophagus into the stomach and benign ulcers. Polyps of stomach may be single or multiple, and usually have an oval or circular ring density, they may or may not have a stalk. Giant rugae are usually associated with similar changes elsewhere. Gastric varices may occur without demonstrable oesophageal varices. They appear as thick tortuous mucosal folds near the cardia and extend towards the antrum and up the superior pole of the stomach.

Among the extrinsic lesions, simulating carcinoma, splenic flexure of the colon may simulate a lesion, the diagnosis is made by visualising the air filled colon or by demonstrating barium in it. Pancreatic lesions may be diagnosed by the increased retrogastric soft tissue space in the lateral view and by demonstration of flecks of calcium in the pancreas. Presence of a subphrenic abscess may displace the stomach caudad—Here the

history and clinical findings are important. Irritative phenomena in the base of the left hemithorax, elevation of the left dome of diaphragm, and occasional left pleural effusion are helpful. Presence of gas within abscess is often of great help.

14 radiographs.

S. N. Deboo, Bombay.

Ross Golden, Technical factors in the roentgen examination of the small intestine, *Am. Jour. Roentgenology*, Dec. 1959, Vol. 82, 965-972.

Abdominal and general systemic symptoms may be produced by either functional disorders or organic disease of the small intestine.

Several methods of examination of small intestine have been used. The simplest is to have the patient drink a barium preparation and then take a series of radiographs as it passes along. A rapid method consisted of giving an ice-cold suspension of barium sulphate in normal saline, followed by 8 oz. of ice-cold normal saline solution. The small intestine enema is given by passing a tube into the proximal jejunum and then allowing barium to flow into the intestine under fluoroscopy, until it reaches the caecum. A Miller Abbott tube study may be used. In rare instances reflex through the ileocaecal valve by a barium enema may be used, but is not the method of choice.

Re the opaque material, under certain conditions, flocculation occurs. It may occur with emotional disturbances or with sprue and other nutritional disorders. Water-soluble opaque media such as Urokon do not outline the mucosa of small intestine satisfactorily.

The small intestine study made at half-hour intervals shows the transit time in the majority of persons between one and three hours. If barium has not reached the caecum in 4 hours, a food stimulus is given. The response may be sluggish or even absent for example in sprue. It may be vigorous, so that the ileum may empty itself in a relatively short time. It is important to visualize the terminal ileum and caecum to determine tenderness and to establish presence or absence of a mass and its exact relationships, mobility etc. Pressure films of terminal ileum and caecum are necessary to disclose the mucosal pattern.

High kilovoltage films disclose the margins of overlapping loops of intestine which are usually obliterated by the superimposed barium shadows, giving a more accurate impression of the mucosa. Small masses arising from the mucosa can be more easily demonstrated. The non-opaque material may appear finely divided or as larger masses. Hypothetical explanation for them is masses of mucus, but their composition is unknown. There could be slow movement of unabsorbed food-material, or indicate a disturbance in absorption. There are purely hypothetical explanations. Further study is necessary to find if the observation is physiological and what, if any, clinical significance it may have.

S. N. Deboo, Bombay.

Jerome H. Shapiro; Wilhelm Z. Stern and Harold G. Jacobson, Oral cholecystography, A review of techniques, *Am. Jour. Roentgenology*, Dec. 1959, Vol. 82, 1003-1010.

The authors present a number of roentgenological techniques for use in oral cholecystography as an aid in establishing

diagnosis. An accurate evaluation of gallbladder structure and function by means of oral cholecystography requires roentgenograms of the highest technical quality, immediate viewing of the processed films to determine what further exposures and technical modalities are required to complete the examination.

The factors militating against normal opacification of the gallbladder should be kept in mind, they are hepatocellular damage, peritonitis, pancreatic insufficiency, recent abdominal surgery and pyloro-duodenal obstruction.

In addition to preliminary scout film, at least 3 films are included in the examination. They are posteroanterior prone, posteroanterior erect and left anterior oblique. Another in the left anterior oblique prone position is obtained 30 to 60 minutes after administration of a cholangiogram.

Radiolucencies within the gallbladder may be caused by (i) radiolucent calculi (ii) overlying intestinal gas and/or fecal material with a normal gallbladder and (iii) radiolucent calculi with overlying gas and/or fecal material. Additional studies are then required. They are:

- (1) Lateral decubitus position (left side up)—but these result in cholecystograms of poor contrast.
- (2) Barium swallow to outline duodenal relationship, separating the gallbladder from it.
- (3) Opacification of colon by barium or gas thus separating the hepatic flexure from the gallbladder, 2 simple tilt-tubings are used (1) anteroposterior 25° tube-tilt towards the head with patient supine (2) a posteroanterior tilt 25° towards the head with the patient prone.

- (4) Trendelenberg supine position, fluoroscopy with graded compression in erect position, laminagraphy, multiple dose techniques, may be used.

No single technique is uniformly applicable; problem cases must be individually handled. When properly performed in cases of intact hepatocellular function, the accuracy should approach perfection.

S. N. Deboo, Bombay.

Eric Gunnarson, Oral Cholegraphy, *Acta Radiologica*, Oct. 1959, 52, 289-296.

A new method of oral cholegraphy with a 50 per cent solution of the sodium salt of iopanoic acid (Bilijodan-Natrium) in galatine capsules is described. In 1955, a beginning was made to use the sodium salt of iopanoic acid, Bilijodan Natrium, and it was found that the bile ducts were faintly defined in as many as 50 per cent of cases in which no filling was obtained, as against only 27 per cent of cases examined with Telepaque.

In order to secure a method for everyday oral cholegraphy, a gelatin capsule containing 0.45 Bilijodan Natrium was given to patients. The capsules contain 50 per cent solution of contrast medium. The patient is directed to lie on his right side as soon as he swallows them. The capsules sink towards the pylorus and dissolve. The patient is asked not to crunch the capsule, as it produces a disagreeable sensation of burning in the mouth and throat. He should lie on his right side for at least 60 minutes, so that by this time, the contrast medium will be absorbed and will reach a satisfactory concentration in the bile ducts. Films are then taken.

Like oral cholecystography, with tablets, there is a sometimes nausea and diarrhoea, but are not serious.

116 ambulatory patients referred for routine examination of the hepatobiliary tract were selected, for the investigation. It was found that filling of the ducts was equally good, if not better, than the intravenous cholegraphy. An advantage of the oral cholegraphy was that satisfactory filling of the bile ducts is sometime obtained in cases in which the concentration of the contrast medium in the ducts after intravenous cholegraphy is not sufficient to permit a positive diagnosis.

Oral cholegraphy was satisfactory in 7 cases in which the intravenous method had failed, while intravenous cholegraphy proved successful in 2 cases in which the oral method had failed.

4 radiographs.

S. N. Deboo, Bombay.

D. S. Dann; S. Rubin and A. Bauernfeind, Significance of visualisation of the common bile duct in the non-visualised gallbladder, *Am. Jour. Roentgenology*, Dec. 1959, Vol. 82, 1016-1019.

The authors used Iopanoic acid as the contrast medium except in 31 cases where pheniodol was used. The common bile duct was visualised in only 3 of the latter, compared with 60 of the former. Visualisation was faint in 24, moderate in 17, and good in 22. Surgery was performed in 28 of the 60 patients, and in all the gallbladder showed cholecystitis and cholelithiasis with one exception of chronic cholecystitis, and extreme atrophy of the gallbladder without stones. In only 3 cases was a stone recorded in the cystic duct.

55 cases (out of the 140 cases with non-visualised common bile duct) were operated upon, and in 48 of these, cholelithiasis and inflammatory changes of the gallbladder were found similar to the group with visualised

ducts, but in seven cases no stones were found, and 5 of these 7 cases did not have gallbladder disease but failed to visualise. The findings in these cases were chlorpromazine jaundice and cholangitis with jaundice, metastasis in the hepatoduodenal ligament, carcinoma of the pancreas and of stomach, while the other 2 cases were cases showing cholecystitis.

The authors conclude that visualisation of the common duct indicates that the contrast medium was absorbed, reaching the liver *via* the portal circulation, then it was excreted by the liver cells, and then drained by the bile ducts. This leaves the cystic duct and gallbladder as the only source of pathological changes to explain non-visualisation.

S. N. Deboo, Bombay.

J. A. Veiga-Pires, Pyeloureteritis Cystica, A report of 2 cases, *Jour. Fac. Radiologists*, Oct. 1959, Vol. 10, 207-212.

Over 90 cases were described in the literature. No cases below the age of 20 were recorded, 62 per cent of the cases were in women. Males predominated in the age of 20-30 years, thereafter females predominated in each age group with the exception of the last (60-70 years) when the incidence was equal.

On excretion pyelography, renal function will vary with extent of the disease, and the severity of infection. Pelvic compression should not be used through out the examination, since it could produce excessive filling of the ureter and pelvicaliceal system, which might obscure small alteration of outline or structures protruding into the lumen. Retrograde pyelography is the investigation of choice. Carbon dioxide can be safely used to produce double contrast. During injection of radio-opaque media, care should be taken to prevent the

passing of air-bubbles into the ureter. Tomography may also be useful.

The condition is characterised by small cysts varying in colour from hemorrhagic pink to grey and which contain a more or less viscous fluid. Lesions may involve the fundus and the trigone of the bladder.

The most common complication of pyeloureteritis cystica, particularly if of the upper ureter, pelvis or pyeloureteric junction is obstruction producing hydronephrosis, with progressive destruction of the renal parenchyma. Calcification of the cyst contents has been described. There is a potential danger of malignant change, particularly in the bladder, leading to adenocarcinoma. Renal calculi may develop.

Clinically there is history suggestive of a chronic urinary infection with loin pain, dysuria and frequency. Pyuria and hematuria are practically constant findings. Sometimes condition is found almost by chance. At times the urine may be sterile. Cystoscopy may reveal small cysts situated in the region of the trigone or may show a normal bladder.

Radiologically, the cysts produce punched out defects in the lumen. If they form clusters and are small, they give a ragged appearance particularly in the ureter. Gross hydronephrosis and hydroureter may develop. The radiographic picture may remain unchanged for years.

The commonest condition simulating it is the presence of air-bubbles in the renal tract at any level, a differential diagnostic sign is that the bubbles tend to move with the change of position of the patient. Two cases are reported in detail.

7 radiographs.

S. N. Deboo, Bombay.

J. G. Sowerbutts, Some uses for presacral Oxygen insufflation, Jour. Fac. Radiologists, Oct. 1959, Vol. 10, 201-206.

The author discusses the literature on the subject and describes the London Hospital technique. In view of the increased liability of the patient to move in the genupectoral position, with resulting danger to embolism, the lateral decubitus position is recommended while injecting. In view of the extreme rapidity of absorption of Carbon dioxide, Oxygen is preferred as the medium to be used. Where both sides are to be investigated, 500 c.c. of Oxygen are injected on one side, and another 500 c.c. after the patient has been carefully turned without moving the needle.

After a scout film, anteroposterior and lateral tomograms are taken for better detail. The only contraindication is the presence of infection around the injection area. The most serious complication is the risk of gas embolism. Minor complications are dyspnoea, choking sensation, retrosternal pain, hoarseness and loss of voice.

The presacral Oxygen insufflation is of most value in—

(a) renal cysts, tumour and fibrosis due to pyelonephritis. The combination with retrograde pyelography is extremely useful. It confirms suspected renal enlargement of the kidney shadow as seen in pyelograms. It is of considerable value in showing loss of renal parenchyma as a result of chronic pyelonephritis.

(b) cases suspected of hypertension of renal origin. 19 cases of suspected hypertension were investigated and 5 showed definite loss of renal parenchyma with dilatation of calices.

(c) suprarenal lesions (a) tumours—phaeochromocytoma, primary aldosterone-secreting tumour, adenoma or adenocarcinoma.

In cases of hypertension due to phaeochromocytoma, it will frequently demonstrate site and size of the tumour. However negative findings do not exclude it, and even if one has been shown, the possibility of multiple tumours must be remembered. (b) hypertrophy-Cushing's disease. In Cushing the investigation may help to differentiate between a tumour and hypertrophy. In the latter condition both glands should be considerably enlarged, while in the former, one gland is normal or atrophied, and the other is enlarged. (c) Enlarge abdominal glands. It was possible to show enlarged glands by the technique, in 2 cases of Hodgkin's and in one of carcinoma of the bladder.

8 radiographs.

S: N. Deboo, Bombay.

R. C. Bledsoe and J. L. Izenstark, Displacement of fat pads in disease and injury of the elbow. A radiographic sign, Radiology, Nov. 1959, Vol. 73, 717-724.

Injuries, particularly linear fractures of the radial head may be difficult to detect in the routine radiographic study of the elbow. The radial head is surrounded almost completely by synovial membrane. Between the capsule and the synovial membrane are 3 masses of fat, each occupying one of the 3 fossae. The largest, within the deep posterior olecranon fossa, is pressed into the fossa by the Triceps brachii during flexion. The other 2 occupy the shallower anterior coronoid and radial fossae, into which they are pressed by the brachialis during extension.

To confirm displacement of the fat pads by fluid, several cadaver elbows were injected with contrast media. The injected specimen all showed variable displacement

of the fat pads, the displacement was dependent on the amount of fluid present.

A true lateral view of the elbow with the joint flexed at right angles is the optimum position for visualising the fat pads. The central ray is perpendicular to the film, and is directed over the radial head. The technic should be such that satisfactory bone detail and soft tissue visualisation are obtained. In children with suspicion of trauma to the elbow, every effort should be made to include a true lateral view of the elbow, so that the joint can be surveyed for fluid.

Due to the difference in x-ray absorption between fat, muscle and bone, the fat is readily recognisable in the radiograph. The 2 anterior fats pads fitting into the coronoid and radial fossae are seen as a single triangular area of radiolucency, the anterior border forming a straight oblique line. When the synovial fluid is increased, the anterior surface may be straight or slightly convex, and the inferior surface concave. The posterior fat pad is normally not visible on the lateral flexion view of the elbow, being overshadowed by overlying bone. When displaced, this pad may be seen as a radiolucent area posterior to the humerus at the upper border of the olecranon fossa. An associated finding is the posterior displacement of the Triceps tendon as it curves round the distended capsule. It is important to bear in mind that bursitis may occur within the elbow joint and results in synovial effusion which would distend the synovial sac and cause displacement of the fat pads. Bursitis may be thus indicative of such systemic diseases as gout and rheumatoid arthritis.

1 figure, 8 radiographs.

S. N. Deboo, Bombay.

I.B.D. Middlemiss, Bone changes in adult cretins, British Jour. Radiolog., Oct. 1959, Vol. 32, 685-688.

The paper is based on 32 cases where the diagnosis was established by clinical examination and by estimations of radioiodine uptake, serum protein-bound iodine and serum cholesterol levels, and where thyroid therapy had been omitted or inadequate at the critical stage of development. 12 cases showed no skeletal abnormalities in the skull, lumbar spine, hips or wrists except for the smallness of their bones.

In the remaining 20 cases, changes were as follows:—

Skull.—There was under-development of air sinuses. The frontal sinuses were absent or small. The sphenoidal sinus was completely absent in 3 cases, did not extend behind the midpoint of the pituitary fossa in 16 cases. 7 cases showed a cellular mastoids. Persistence of several unerupted molars was common. The skull in 2 cases was thick and heavily ossified. About one-fifth of the 32 cases showed enlargement of the pituitary fossa.

Lumbar spine.—4 of their adult 32 cases showed any localised abnormality in the dorsolumbar region, all had gross spinal deformity clinically. 3 cases showed reduction in the vertical heights of vertebral bodies with some relative increase in depth of the disc spaces.

Hips.—2 cases showed persistent fragmentation and flattening of the head or the femora with broadening of their necks. Coxa vara with flattening of a more completely ossified femoral head was present in 1 case, and 2 cases showed an appearance similar to congenital dislocation of the hip.

Wrists.—27 cases showed bones smaller than normal. In 3 cases ossification was delayed. 2 cases showed stippling of increased density in the metaphyses of the radius and metacarpals just proximal to the site of epiphyseal fusion.

These changes are of no practical value in diagnosis since the latter is painfully obvious on clinical grounds alone. Still they are of some interest in showing the effects on the skeleton and pituitary of prolonged deprivation of thyroid hormone which probably began in utero.

4 radiographs.

S. N. Deboo, Bombay.

Victor M. Rosenoer and R. C. Michell, Skeletal changes in Wilson's disease (hepato-lenticular degeneration), *Br. Jour. Roentgenology*, Dec. 1959, Vol. 32, 805-809.

The authors report here the radiological findings in a series of ten cases of Wilson's disease. 7 of the 10 cases showed wedging of the vertebral bodies in the lumbar or dorsal spine with irregularity of their upper and lower margins, typical of Scheurmann's disease. Bone fragmentation, characterised by irregularity and sclerosis of the subchondral bone, was seen in 4 cases, and was most easily demonstrated in the wrists and elbows. Osteochondritis dissecans was seen in 3 patients, two of these showed the lesions on the medial femoral condyles, whilst the 3rd patient has a large area of osteochondritis dissecans on the medial aspect of the talus. Osteoarthritis was seen in 4 patients unassociated with osteochondritis dissecans. Osteoporosis of a slight degree was seen in 4 cases, but gross changes of osteomalacia with Looser's zones were not seen, nor was seen any tendency to develop fractures.

Clinically, there is a nodular cirrhosis of the liver, with progressive damage to the nervous system, particularly in the lenticular region. The manifestations usually appear in late childhood or in adolescence. The predominant symptoms are tremor, rigidity, dysarthria and dysphagia. Episodes of hematemesis may occur. A smoky brown or grey-green ring at the limbus of the cornea (Kayser-Fleischerring) is pathognomonic and is present in the majority of cases.

Bone changes may be related to a renal tubular anomaly. Hyperaminoaciduria, glycosuria, hypophosphaturia, peptiduria and proteinuria have been reported. This may be due to copper deposition in the kidney which might interfere with transport mechanisms in the tubular epithelium. No studies are yet available demonstrating the skeletal effects of copper excess. The pathogenesis of Wilson's disease is still obscure.

8 radiograms, 1 table.

S. N. Deboo, Bombay.

G. Lombardi and F. Migliavacca, Angiomas of the spinal cord, *Br. Jour. Radiology*, Dec. 1959, Vol. 32, 810-814.

Angiomas constitute 3 to 4 per cent of all spinal tumours. Eighteen cases of angioma of the spinal cord are presented here, 13 of which were operated on.

The average age of the patients was 43.4 years for men and 42.2 for women. The average duration of symptoms was 5.7 years. In the 13 cases operated upon, the duration was 4 years for venous angiomas, 6.5 years for arterial angiomas, 9.5 years for arteriovenous angiomas. The lower dorsal and lumbar regions were the sites of these malformations in 14 cases, in the remaining 4, they were localised in the cervical region. Angiomas above D-5 have

never been reported in the literature. The neurological symptoms had a slow onset in 11 cases, and sudden onset in the other seven. The latter group included 2 patients with episodes of subarachnoid haemorrhage. In 16 patients, there were motor disturbances in the limbs, these were of the hypertonic and spastic type in 11 cases and hypotonic and flaccid in the remaining 5. Paresthesia then occurred accompanied by burning sensations. Pain was absent in 5 cases. Cutaneous naevi were not encountered in any of their patients. Examination of C.S.F. on 12 occasions showed a rise in albumin which occurred in all arterial, arteriovenous and venous angiomas. So clinically there is no clinical sign pathognomonic of angiomas of the spinal cord. Presence of blood in the C.S.F. the most indicative sign of angiomas is rare.

Radiologically, in exceptional cases, there is erosion of a pedicle. The radiological diagnosis is based on the use of contrast media. With gas myelography, they are rarely detected. With iodised oils, small amounts if injected will break up and interfere with accuracy of diagnosis, where as large amounts (5 to 6 ml.) facilitate demonstration of typical vascular patterns. Arteriography is not a practical method for detecting such malformations. The typical myelograms show transparent streaks, tortuous and sometimes interrupted in their course.

Treatment consists of laminectomy, the dura being closed after the exploration. Extirpation is possible only in rare cases, where the malformation has developed completely outside the spinal cord. Another method is section of the ligamentum denticulatum, reducing intramedullary tension. Radiotherapy is not indicated in their treatment.

5 radiographs, One table.

S. N. Deboo, Bombay.

J. A. del Regato and J. M. Sala, The treatment of carcinoma of the lower lip, *Radiology*, Dec. 1959, Vol. 73, 839-844.

Carcinomas of the lower lip are frequently highly differentiated with a relatively low proportion of metastases. This paper is based on a study of 531 cases of previously untreated cancer of the lower lip, all confirmed by biopsy. 59 were of the verrucous type and 336 were grade I carcinomas, 103 were grade II, and only 4 as grade III.

The form of treatment is based on size of the primary lesion, metastases, degree of differentiation of tumour, and whether or not he is previously treated. Primary lesions measuring less than 2 cms, are curable by all methods, but here surgery is preferable because it is expeditious. However Roentgen therapy is the treatment of choice for lesions measuring 2 cms. or more, because it is more flexible and yields best aesthetic results. Most of the cases were treated with 110 kV and 0.25 mm. Copper filtration. In a few advanced cases 250 kV was used. The total dose was of the order 3000 r (measured in air at the surface of the lesion) for treatments of less than ten days, and of as much as 7000 r for treatments of six weeks of duration. Daily application of divided doses are preferred, but the recent tendency is to maintain the same daily dose throughout the course until the desired total is obtained. Care of the skin and mucosa following radiotherapy is best taken by daily antiseptic sprays and oily dressings. In some instances of contamination, administration of antibiotics becomes necessary until the epidermic layer is entirely replaced. 33 of the 531 cases showed metastases on admission. In 39 cases metastases developed on admission. The most frequent site is the prevascular node of the anterior submaxillary region, but they also occur in the submental region and

in the facial nodes. The treatment of choice here is a neck dissection, of the radical type, and it may often be extended to include the contralateral submental and submaxillary lymph nodes.

In 306 patients with lesions less than 2 cms, results were satisfactory, there were 7 recurrences, and 17 subsequent recurrences, with only 5 deaths, with cancer. In 192 patients with lesions over 2 cms, there were 18 recurrences, and 22 subsequent metastases with 18 patients dead with cancer. Of a total of 33 patients 12 (38 per cent) were cured. In 39 cases, where metastases developed after admission, the disease was controlled in 18 (46 per cent).

3 tables.

S. N. Deboo, Bombay.

A. G. W. Whitfield and W. H. Bond,
Prevention of radiation lung damage,
Jour. Fac. Radiologists, Oct. 1959,
Vol. 10, 181-185.

Whenever deep x-ray therapy is given to the thorax, there is danger of radiation damage to the lungs. In post-mastectomy radiotherapy the damage is more or less limited to the upper zone of the lung on the treated side. Permanent diminution in exercise tolerance and a troublesome dry cough and dyspnoea usually result. But the radiation damage is never fatal, and its residual are not incompatible with normal life. When however chest baths or wide thoracic fields are used, both lungs are in hazard, esp. when wide fields are used or when dosage is excessive. There is always the danger of mistaking radiation damage for extension of the neoplastic process and giving further radiotherapy brings about disastrous results.

The problem is how to minimise the radiation risk to the lungs when such

techniques with chest baths and wide thoracic fields have to be employed as in intrathoracic raticuloses, inoperable oesophageal and bronchial neoplasms, and lung secondaries from seminoma, chorionepithelioma and thyroid carcinomas.

Anticoagulants and steroids have been given with a view to prevent radiation damage. Anticoagulant therapy with dindavan was given to eight patients in whom wide-field therapy was essential. Four of the 8 patients suffered no radiation damage and the results of treatment were wholly satisfactory. But 3 cases showed some evidence of radiation lung damage, and one died from radiation damage to the heart, though at autopsy the lungs appeared unscathed.

Five patients were given oral cortisone in a dose of 75-100 mg. daily through out the period of radiotherapy and for 3 months thereafter. One patient died from radiation lung damage, and another suffered from mild radiation damage to one lung, but the other 3 were entirely satisfactory.

The results in the 8 patients giving anticoagulant therapy were disappointing, so that if anticoagulants afford any measure of protection to the lungs at all, they are not a complete safeguard against the danger of radiation damage. Steroid therapy is of value in established radiation lung damage, but to anticipate that it might prevent such damage from occurring, the results in the 5 cases treated show that this is not the case.

Until some effective prophylactic agent can be found, it is advisable to use chest baths and wide thoracic fields only when such techniques are absolutely essential.

10 case histories.

S. N. Deboo, Bombay.

Milton J. H. Grand, Stuart Eichenfeld and Harold G. Jacobson, "Sacral Aplasia" (Agenesis), Radiology, April 1960, Vol. 74, No. 4: 611-618.

Partial or complete sacral aplasia is rare. Out of 169 congenital anomalies, the authors found 5 cases of absence of spinal segments, 3 of congenital absence of all or part of the lumbar spine, sacrum and coccyx, and 1 of solitary coccygeal absence. 104 cases are collected in the literature.

This condition is important to the clinician as well as the radiologist because of its relation to cord bladder, faecal and urinary incontinence and abnormalities of gait. 3 new cases of sacral aplasia, 2 complete and one partial are described by the authors.

First case.—3 years old boy, complaining of faecal and urinary incontinence since birth. On examination - there was absence of gluteal masses and natal creases, prominent lumbar shelf, a fat pad over the sacral area and Cone-shaped lower extremities. X-ray showed absence of sacrum except the first segment. Sub-cutaneous pyelogram showed dilatation of right collecting system and bladder with funnel-shaped outlet, just like other neurogenic bladders. Barium enema showed markedly distended colon with retention of faecal masses in the large bowel and a few narrow but dilatable areas due to spasm-neurogenic colon.

Second and third cases were also similar in clinical complaints and examination. Etiology - is not known but it is surmised that illness, pyrexia or presence of toxic substances in the maternal circulation might cause lack of development of spinal segments.

Sacral Aplasia falls into two groups. Group I - S.I. is present or L₅ is sacralised. The bony ring is complete with normal

weight transmission to Innominates and femora. These patients have normal gait. Group II - complete absence of sacrum, so walking is difficult or impossible. Neurological abnormalities result from interference with development of spinal nerves and muscular atrophy is also due to this. Perineal, leg and buttock muscles are involved. Over 50% of cases show club-foot and dislocation of the hips due to vertical placement of the innominates.

The only treatment which can be offered is orthopaedic towards correction of deformities.

Figures 8, References 19.

**S. Chawla.*

Harold Haft, Charles E. Weinstein and Erich G. Krueger, "Larger Volume Pantopaque Lumbar Myelography", Radiology, April 1960, Vol. 74, No. 4, 605-610.

Material.—30 patients clinically complaining of L₄, L₅, S.I. radiculitis were selected and each group of 10 patients was injected with 6 c.c., 9 cc. and 12 cc. of Pantopaque.

The results showed that (i) Time taken from the 1st film to the completion of diagnostic phase *i.e.*, upto initiation of pantopaque removed was least *i.e.* 35 min. for 9 cc. It was 56 minutes for 6 cc. and 46 min. for 12 cc. (ii) average time for the removal of all possible contrast material was 20.5 minutes for 6 cc., 13 minutes for 9 cc. and 10.5 minutes for 12 cc. The total time from first film to the removal of needle after complete evacuation of the medium and the amount of pantopaque remaining was least for 9 cc. injection.

The authors review the literature and agree that larger volume gives better film diagnostically and technically, requires less

time and effort, less discomfort to the patient and less potential post-myelographic complications because of smaller amount remaining in the spinal canal. Also shorter fluoroscopic time gives less radiation to the patient and the doctor. This study indicates 9 cc. is the optimum volume for lumbar contrast myelography.

Figures 7, Reference 6.

S. Chawla.

Bluth Irwin "Gastro-intestinal Carcinoid Tumors", Roentgen. Features, Radiology, April 1960, Vol. 74, No. 4, 573-580.

Recently, the malignant carcinoid Syndrome is recognised as a clinical entity. The basic findings are chronic diarrhoea, flushes, cyanosis, respiratory distress and riget-sided cardiac disease.

Gross Pathology.—The Tumor can occur in any part of the Gastro intestinal tract and is usually a small, sub-mucosal nodule. Polypoid or annular growths are less common and usually epithelium is intact. Rarely a large, polypoid intraluminal growth may occur.

Pathologically they are classified into 4 groups. Group I - Non-invasive, confined to mucosa and sub-mucosa. Group II-invading the bowel wall muscle, Group III-invading nodes. Group IV - involvement of B.V. and distant metastases. The disease is of very long duration and 10-20 years may pass even after the nodes are involved.

In surgical specimens, appendix is the commonest site but it is not detected radiologically. 3.5% of appendiceal carcinoids metastasise. *Stomach* - 2% of total carcinoids occur in the stomach but out of stomach tumors, carcinoids is the least common tumor. Radiologically it is seen as a

(i) small mass with shallow ulcer when it has to be differentiated from myoma, adenoma or (ii) as large fungating mass D.D. polypoid cancel.

Duodenal carcinoids are also uncommon - 1% of total G.I. tract carcinoids, appear as small polyp in the first part, it has to be differentiated from adenoma, myoma, lipoma or prolapsed gastric polyp. Autopsy shows distal ileum as the commonest site in the Intestines and jejunum is the next. Roughly 15% of the total carcinoid Tumors occur in ileum.

Radiologically the S.I. carcinoid may (i) present as obstruction though the primary tumor is small, by extending through the bowel wall or causing kinking of the bowel or rarely intussusception (ii) present as polypoid filling defect.

Colon.—Carcinoids are 4% of the total carcinoids and they present as (a) large polypoid intraluminal mass. D.D. Primary adeno-carcinoma (b) large bowel obstruction due to the size of the mass, infiltration or intussusception.

Rectal.—Carcinoids are usually small, sub-mucosal nodules, 1 cm - or less in diameter and commonest site is the anterior wall of the rectum. 4 cases are discussed in detail occurring in the small and large bowel. The author suggests that all Gastro-intestinal carcinoids except those of the appendix be regarded as malignant though the duration of these, is very long. The usual site is in the ileum, within a few feet of the ileo-caecal valve and these usually metastasise giving carcinoid syndrome though they occur also in appendix, stomach, duodenum, jejunum and rectum. The flushing of the face, seen in these cases is due to high serum serotonin.

Figures 9, References-25.

S. Chawla.

Purcell, W. M., and Mulcahy, F. 'Non-Osteogenic Fibroma of Bone', Clinical Radiology, The Journal of the Faculty of Radiologists, Vol. XI, p. 51-59, January, 1960.

Non-osteogenic fibroma is a benign cyst-like condition generally found in the metaphysis of long bones in older children and young adults and only occasionally in later life. Histological examination reveals whorls of connective tissue interspersed with giant cells and lipid containing macrophages. Jaffe and Lichtenstein considered it to be a benign tumour arising from mature marrow connective tissue, whereas Hatcher considered that the abnormality was due to a localised disturbance.

There is no marked difference in sex incidence. The patients present with pain or swelling. A small number presents with a pathological fracture and the remainder are discovered during x-ray examination for other unrelated conditions. On radiological examination the lesion consists of a translucent defect which may vary from a few millimetres to as much as five centimetres in length. It is usually elongated with the long diameter running along the length of the bone. The sites involved in order of frequency are, the lower end of the femur, the upper end of the tibia, either end of the fibula, and less commonly, the radius, ulna, humerus and ribs. The very small lesion is found in the cortex immediately beneath the periosteum showing as a small cortical defect with sclerotic inner margin. The larger lesion consists of an eccentrically placed zone of translucency in the metaphysis which constantly shows a thin sclerotic shell of bone on its medullary aspect. The lesion has cystic appearance: its walls frequently having a scalloped outline. The presence of irregular bony trabeculae often give the impression of loculation. Usually the outer

margin adjoins the cortex which it may thin and expand. Sometimes cortical thickening may be noticed.

In the narrow tubular bones such as the fibula, radius and ulna the larger lesion frequently occupies the entire width of the shaft and may expand its whole circumference. Pathological fractures may be seen in such cases.

The condition is differentiated from osteoclastoma which occurs at a later age over twenty years and originates in the epiphysis and unlike non-osteogenic fibroma has an ill-defined margin showing no evidence of sclerosis and the tumour is progressively destructive.

Xanthomatosis does not show a clearly defined sclerotic margin and the cortex if involved is destroyed rather than expanded.

In osteoid osteoma pain is a prominent clinical feature and the accompanying sclerosis and periosteal reaction are usually out of proportion to the size of the translucent nidus.

Enchondromata are distinguished by their mottled appearance and irregular calcification.

Monostotic fibrous dysplasia and unicameral bone cysts may be radiologically indistinguishable.

M. L. Aggarwal.

Brinton, F. J., Eban, R. E. "Sideropenic Webs in Men", Clinical Radiology, The Journal of the Faculty of Radiologists, Vol. XI, p. 65-67.

It is no longer held that sideropenic webs are met with only in women. Cases have been reported in men and the authors record

four more cases occurring in men. The webs persist along with glossitis, angular stomatitis and koilonychia even after anaemia is cured and respond to continued iron therapy. Non-anaemic patients having webs were possibly anaemic in the past. On gastric biopsy there is a high correlation between atrophic gastritis and the epithelial changes of webs, but there is no correlation between atrophic gastritis and haemoglobin level at the time of examination.

M. L. Aggarwal.

Walter, J. "Giant-Cell Lesions of Bone: Osteoclastoma and Giant-Cell Tumour Variants, Survey of a Radiotherapeutic Series," Clinical Radiology, The Journal of Faculty of Radiologists, Vol. XI, p. 114-124, April 1960.

The paper is the result of a study in retrospect of 32 cases originally diagnosed as "osteoclastoma" from 1936 to 1957 at Sheffield National Centre for Radiotherapy. A re-assessment of the pathological material and later history showed that only 15 of these cases could be labelled as osteoclastomas and the others were quite different tumours showing giant cells. The classical "soap bubble" appearance is no longer considered diagnostic of osteoclastoma and may be produced by chondroma, fibrous dysplasia, fibroma, angioma etc. The site of tumour and changes in the cortex are probably more important. A diagnosis of osteoclastoma in a patient much younger than eighteen to twenty years must always be suspect.

It is difficult to lay down criteria of cure after treatment by radiotherapy. Appreciable cystic residues may be present with satisfactory clinical results. Such residues

may be seen 7 years or ten years after radiotherapy and biopsy may show giant-cell tissue regarded as viable. The problem of deciding whether a lesion has failed to yield to radiation therapy is clearly not always a simple one.

Because of the very little (10%) difference in the energy absorption between soft and bony tissues, supervoltage or gamma-ray beams are preferable to deep x-rays at 200 to 300 KV when this difference is very high (double). There is now a tendency to use higher doses than formerly e.g., 3000 to 4000 r rather than 2000 to 3000 r and also to prefer single repeated courses.

Simple Bone Cysts and Fibrous Dysplasias. They are pathologically related. Many of these cases are clinically silent. Surgery is preferred to radiotherapy.

Giant-Cell Epulis—This lesion is probably a reactive granuloma rather than a neoplasm of the jaw bones. Surgical treatment is normally preferable, but radiation may be effective.

Aneurysmal Bone Cysts.—Most cases occur at or under twenty years of age, in contrast to true osteoclastoma. Its exact nature is uncertain: it may be a local circulatory disturbance or it may be a type of cavernous haemangioma. These lesions respond to radiation and a dose of 1400 r with 2000 r as upper limit with deep x-rays is suggested.

Hyperparathyroidism.—In early stages, with attention focussed on one region, biopsy may be misleading and histological picture may simulate that of osteoclastoma very closely indeed and mislead even an experienced pathologist. The typical biochemical changes (raised serum calcium, lowered phosphorus, raised alkaline phosphatase etc.), however, settle the diagnosis.

Benign Osteoblastoma.—Alternative names for this rare tumour are osteogenic fibroma, and giant osteoid osteoma. It occurs typically in the first decade of life, with a high incidence in vertebral column. Radiological changes in early stages consist of bone destruction that may be well circumscribed. Ossification gives an appearance of osteoma. Treatment should be conservative as the lesion is benign. Surgical removal or curettage and even incomplete removal may be followed by cure. There is no settled view on effectiveness of radiotherapy, though in the two cases of the authors results were satisfactory.

M. L. Aggarwal.

Colin, Alexander, "Erosion of the Femoral Shaft due to Patello-Femoral Osteoarthritis", Clinical Radiology, The Journal of the Faculty of Radiologists, Vol. XI, p. 110-113, April 1960.

The author has described an erosion of the lower shaft of the femur anteriorly, just above the knee joint, approximately 5 cm. in length and about 5 mm. in maximum depth. Seven of the eight patients were women. Age range was 55 to 84 years. All the lesions were associated with severe patello-femoral osteoarthritis characterised by gross cartilage loss and marginal lipping. Erosion of the anterior quarter of one femoral condyle articular surface was identifiable in 10 of the 11 knees showing shaft erosion. In no case was the osteoarthritis severe in the main tibiofemoral joint. The author has shown that normal knees in extension, only the lower pole of patella is

in contact with femur resting on the upper end of the femoral articular surface. The axis of the patella never converged with that of the femoral shaft—it was parallel or diverged. The gap between the patella and the shaft in normal knees in extension is maintained by—the articular cartilage and the anatomical prominence of the femoral condyle. Both these structures are flattened by erosion in this condition with the result that the gap is lost with the result that the chisel like edge of the arthritic patella comes near the femoral surface and erodes it when it moves up during extension of the knee.

None of the six cases examined for evidence of genu recurvatum showed evidence of recurvatum. None of the cases showed a long patellar ligament or a high tibial tubercle. None showed evidence of recent or antecedent evidence of rheumatoid arthritis.

The condition has to be differentiated from (1) a normal concavity exaggerated by a marginal spur, (2) erosion due to a soft tissue tumour and (3) pseudo-erosion due to a failure of modelling with exostosis formation a few centimeters up the shaft.

The author suggests that the lesion is probably a late result of chondromalacia patellae, but the predominance of the lesion in women is at first sight difficult to explain on this basis, as chondromalacia shows no similar predominance.

M. L. Aggarwal.

INFORMATION LETTER REGARDING

The VIII International Cancer Congress

To be held in Moscow in July, 1962.

DEAR COLLEAGUES,

Each four years the International Cancer Congress is organised by the International Union Against Cancer (Unio Internationalis Contra Cancrum—U.I.C.C.).

At the last VII International Cancer Congress in London in 1958, it was decided to hold the next, VIII Congress in 1962, in Moscow (U.S.S.R.).

The National Organising Committee of the U.S.S.R. informs you that a meeting of representatives of this Committee and leading members of the U.I.C.C. was held in Moscow in May 1960. A number of problems connected with the organisation of the Congress was discussed.

Among the participants of the meeting were Prof. N. Blokhin, President of the Academy of Medical Sciences, U.S.S.R., Prof. A. Savitsky, Chairman of the Cancer Society of the U.S.S.R., Prof. L. Shabad, General Secretary of the National Organising Committee, Prof. L. Zilber, Prof. L. Larionov, Prof. A. Novikov, Prof. A. Rakov and other Soviet specialists. Foreign guests were: Prof. A. Haddow (Great Britain), President-elect U.I.C.C., Dr. H. Dorn (U.S.A.), General Secretary U.I.C.C., Prof. O. Muhlbock (Holland), Chairman of Cancer Research Commission U.I.C.C., Dr. J. Heller (U.S.A.), Chairman of Cancer Control Commission U.I.C.C., Dr. A. Dux (Poland).

Discussion of problems connected with the preparations for the Congress at the meeting

in Moscow was but preliminary. Final decisions will be reached in October 1960, at the meeting of the Executive Committee of the U. I. C. C., in Tokyo.

July 23—28, 1962, is the suggested date for the Congress in Moscow.

The following forms of work are planned: (1) lectures by invited speakers, (2) section meetings where communications on the topics included in the Programme will be presented and discussed, (3) panel discussions on selected topics with invited participants.

The following topics are suggested for the Programme:

1. Role of viruses in the origin of cancer.
2. Precancerous lesions.
3. Tumour immunology.
4. Biochemistry of cancer.
5. Tumour—host relations.
6. The importance of achievements in experimental cancer research for clinical oncology.
7. New methods of cancer treatment (antibiotics, chemotherapy and hormonal therapy).
8. Geographical pathology of cancer.
9. The care of patients with advanced cancer.
10. Long-term results in the therapy of the most frequent types of cancer.

11. Cancer control.
12. Carcinoma of the stomach including the cardia.
13. Carcinoma of the lung.
14. Carcinoma of the ovaries.
15. Carcinoma *in situ* of the cervix.
15. Varia (the new most important developments in different fields of cancer research which were no included in the Programme).

The meeting of the Executive Committee of U.I.C.C. in Tokyo will make final decisions concerning the programme of the Congress; it will choose the topics to be presented at the panel discussions and section meetings; it will also name the invited speakers.

The working languages of the Congress will be English, Russian, French. All lectures and papers are to be given in one of these languages. Simultaneous translation into the two other working languages will be

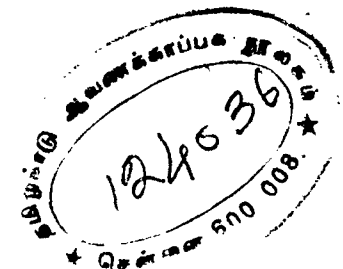
arranged. All the proceedings of the Congress will be published in the above three languages.

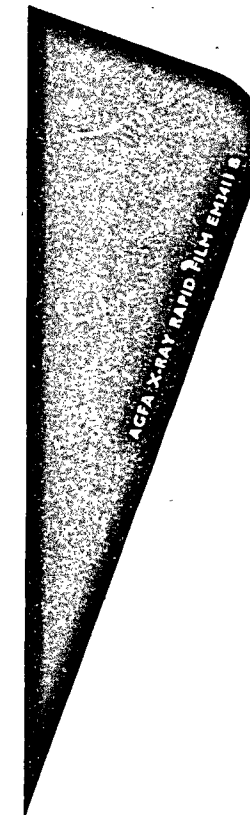
Scientific exhibitions and exhibitions of special equipment will be organised at the Congress. Facilities for demonstration of scientific films oncological problems will be offered.

This information letter contains only preliminary data. After the meeting of the Executive Committee in Tokyo a second information letter will be distributed containing the final programme of the Congress and the accommodations for its participants. We expect to send out the second letter by the end of 1960, so that applications for reports may be submitted during 1961. The deadline for applications and abstracts of papers is December 1, 1961.

Please address all correspondence relating to the Congress to the General Secretary of the National Organizing Committee of the U. S. S. R.—Prof. L. Shabad, Academy of Medical Sciences of the U. S. S. R., 14 Solyanka, Moscow.

—National Organizing Committee of the VIII International Cancer Congress.

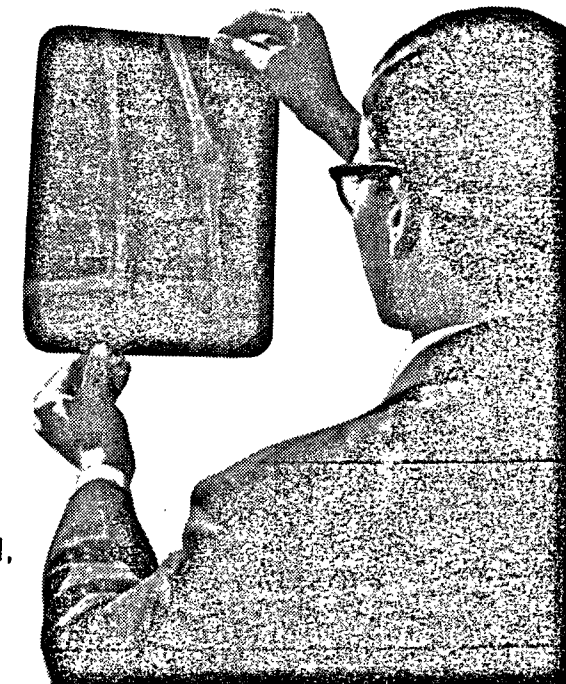




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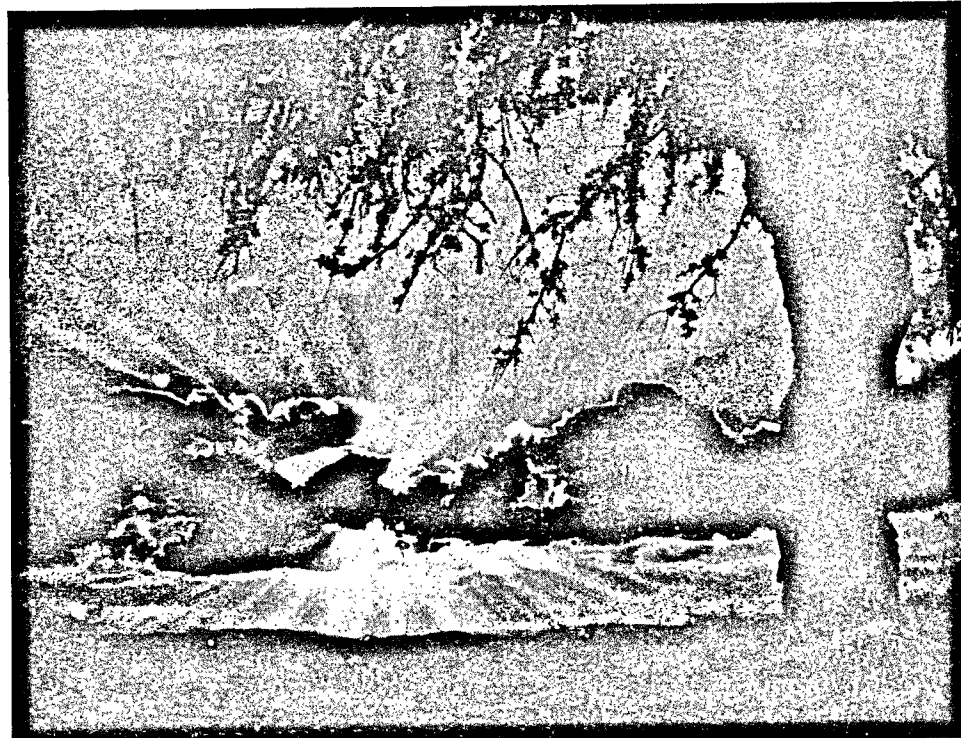
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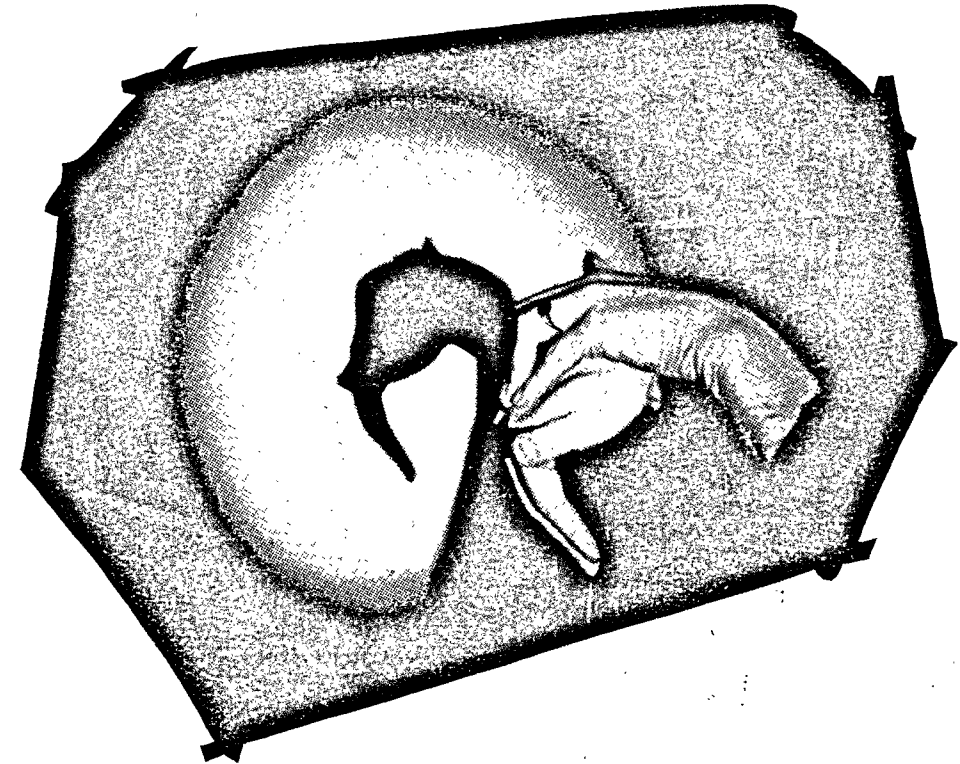
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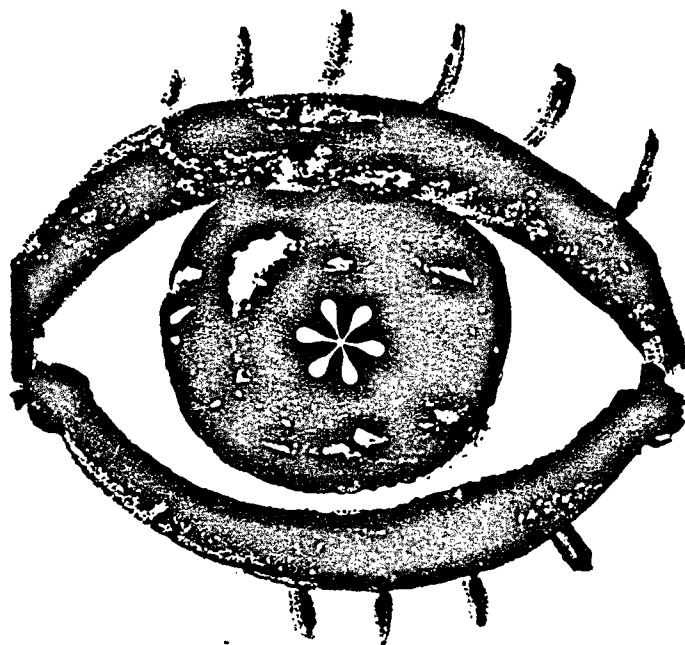
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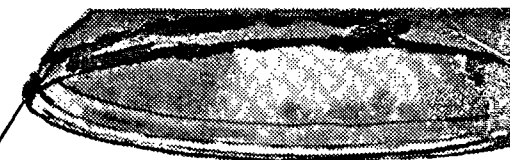
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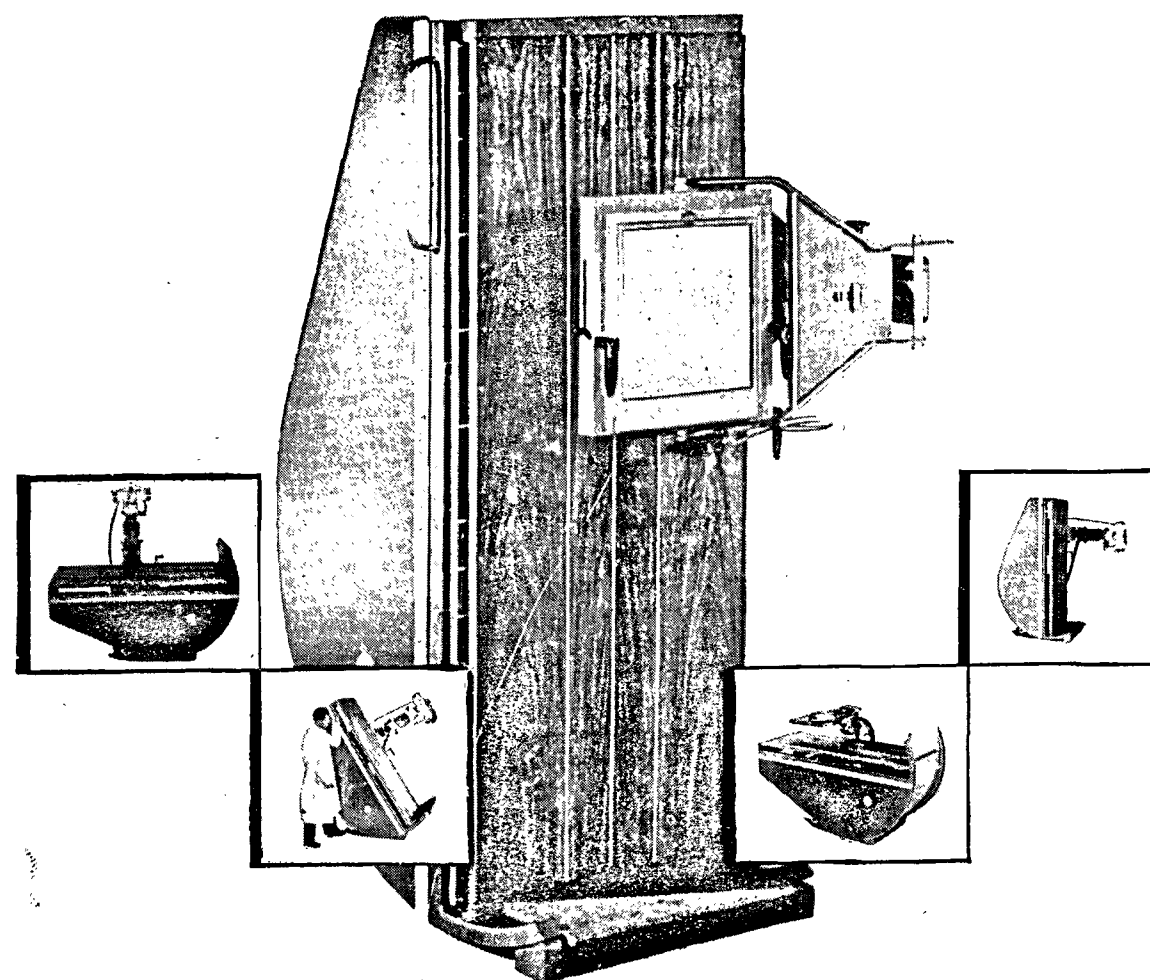
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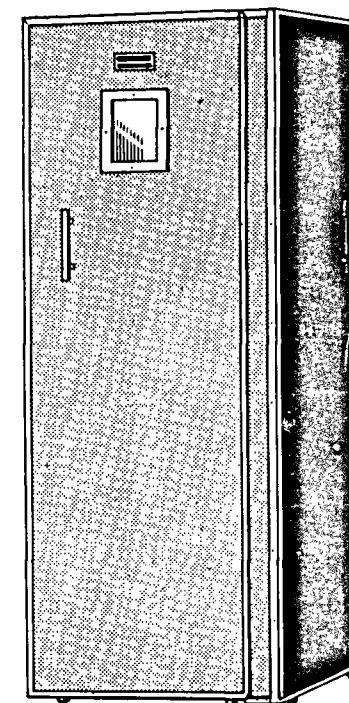


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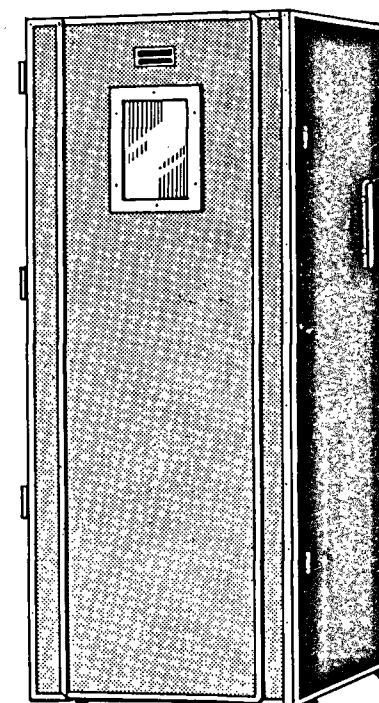
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At the scrutiny of the ballot papers which took place in New Delhi on October 30, 1960,

Dr. L. H. ATHLE, Bombay

secured the highest number of votes and has been declared President of the Indian Radiological Association for the year 1961.

The Second International Congress of Radiation Research will be held at Harrogate, Yorkshire, England, August 5th-11th, 1962. It is sponsored by a Committee set up at the First Congress at Burlington, Vermont, in 1958, and by the Association for Radiation Research. The programme will be concerned with the physical, chemical, biological and medical effects of radiations, particularly ionizing radiations. Research workers in these fields will be invited to proffer original papers and reports of new experimental work. A brochure will be available in April 1961. Information may be obtained from the Secretary-General, Mount Vernon Hospital, Northwood, Middlesex, England.

Statement about ownership and other particulars about newspaper (INDIAN JOURNAL OF RADIOLOGY) to be published in the first issue every year after the last day of February.

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I, Mr. R. Ravaimanickam, hereby declare that the particulars given above are true to the best of my knowledge and belief.

R. RAVAIMANICKAM

Signature of Publisher.

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