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Indian Journal of

Radiology

Nov. 1948

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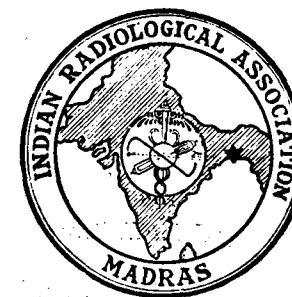
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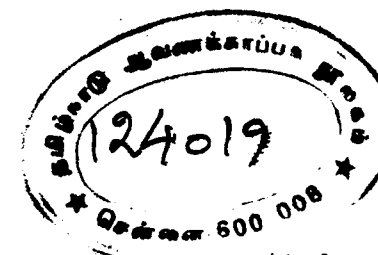
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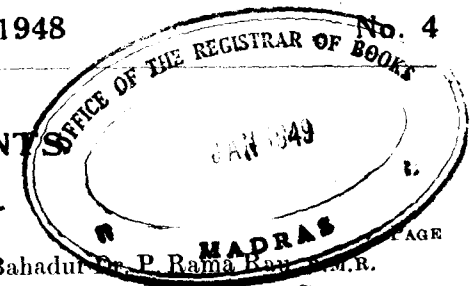
THE
INDIAN JOURNAL OF RADIOLOGY

Vol. 2

November, 1948

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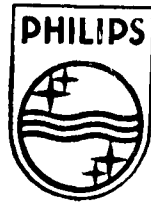
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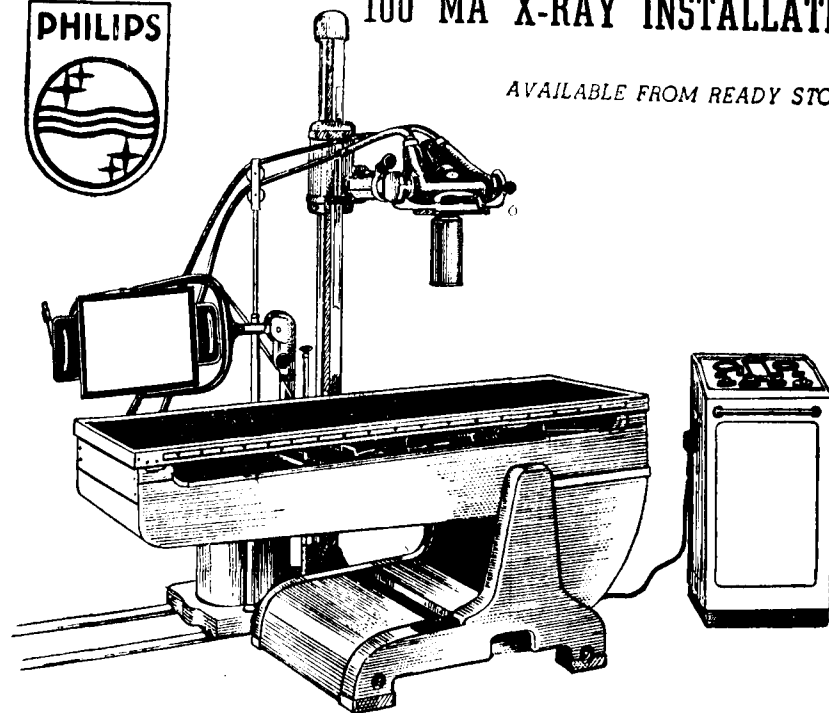
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No. 4.

X-ray Diagnosis in Urology

RAO BAHADUR DR. P. RAMA RAU, D.M.R. (Vienna),
DIRECTOR, THE MADRAS RADIOLOGICAL INSTITUTE
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OBSERVATIONS in this article are mainly based on the notes I took in 1931 from Schwarz, Palagyay and Hryntschak of Vienna and data from Haenisch of Hamburg. The progress made in the past decade or more as reported, and my personal observations, are also incorporated. Instrumental or retrograde pyelography was in vogue before intravenous urography was introduced. The Urological Surgeon in co-operation with the Radiologist was able to obtain information regarding the normal and pathological configurations of the renal pelvis, calyces and papillae, and the ureters; the technical factors such as proper exposures and use of Bucky diaphragm and similar procedures being adopted in an efficient manner.

It is not proposed here to go into the history of developments made by colleagues in the X-ray diagnosis of urological conditions by instrumental or intravenous methods, nor discuss various types of contrast media used from time to time. Attempt is made to briefly go into the technique of preparing the patient for radiological investigations, the X-ray appearances and their significations.

- FIG. 1. Large calculus in the pelvis of the left kidney; a calculus in the left ureter is also seen superimposed by osteophytic bridging between the 3rd and 4th lumbar vertebrae.
- FIG. 2. Localised film of the same case with the X-ray tube centered on the ureteral calculus showing the calculus away from the spine.
- FIG. 3. Pneumo-roentgenogram of kidneys showing their normal shape and the relation to the psoas margins on either side.

Technique: When a patient is referred with clinical findings of renal colic or other associated urinary symptoms, care should be taken to eliminate gaseous and faecal shadows in the colon.

1. No purgative or aperient, as this will invariably give a picture of gas filled colon. A degree of dehydration resulting will vitiate the procedure when intravenous urography is done.

2. An enema the night before and another next morning; or two enemas in the morning of investigation, half-an-hour apart.

3. Morning coffee or tea is permitted, no solids.

4. An injection of Pitressin or Prostigmin soon after the last enema (often times there occurs tendency to expel gas or evacuate).

5. 15 minutes to half-an-hour later, patient is adjusted on the table and radiographed.

A plain radiograph thus taken after the above mentioned procedures should show the psoas margins on either side of the vertebral column, with the medial border of the kidneys approximating and parallel to the psoas margins on both sides. The kidney outline is defined on account of the fat around the capsule, fat being less dense than renal tissue. That is why in a plain radiograph the kidney outline is better defined in a fat sthenic individual, than in a thin person devoid of fat. Usually renal shadow is $6\frac{1}{2}$ cm. or so broad and 13 odd cm. long, the left kidney shadow being lower than the right. The upper pole of the right kidney is superimposed by the lower part and margin of the liver shadow; intra or extra-peritoneal tumours displace the positions somewhat, and so does the shadow vary in position or is indistinct on the plain radiograph in 'horse-shoe kidneys', 'ptosis' and 'wandering kidneys'. Polycystic and hydronephrotic kidneys, or hypernephromas may or may not show the renal outline in a plain radiograph. Intravenous urography is then resorted to, which failing to give necessary data, the retrograde method has to be employed.

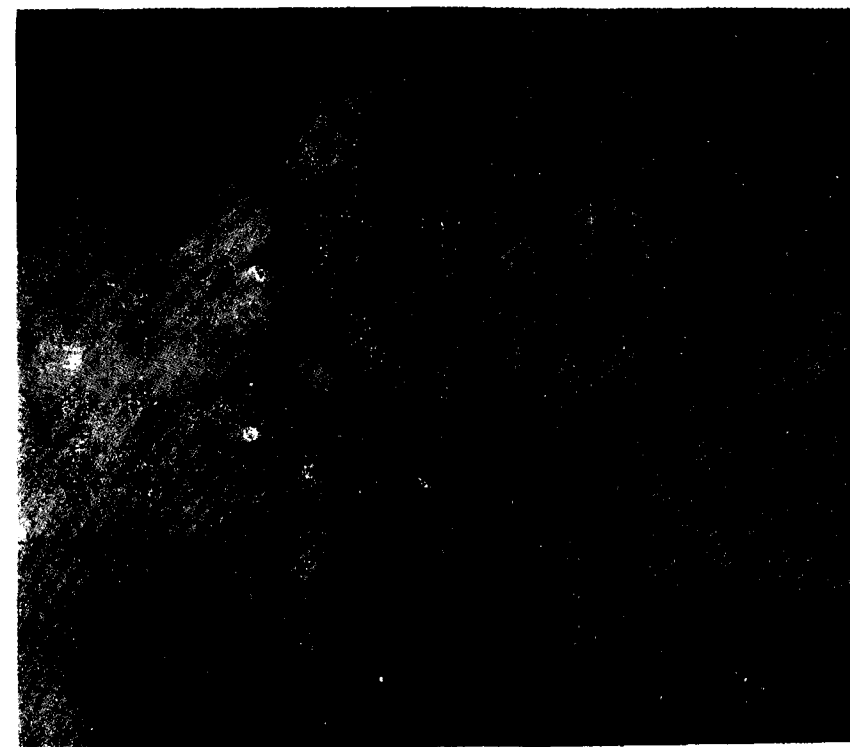


Fig. 1

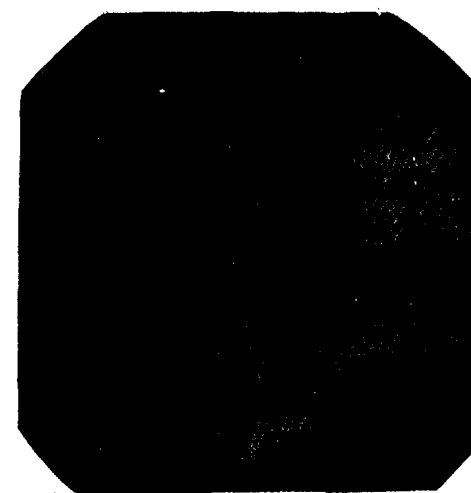


Fig. 2

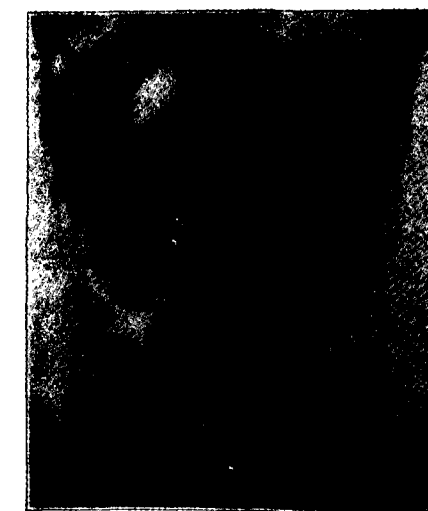


Fig. 3



Fig. 4



Fig. 6



Fig. 5

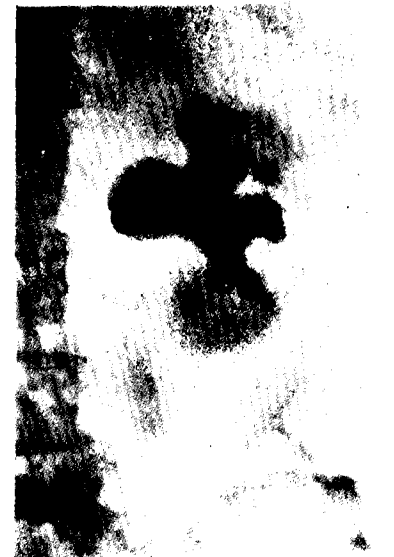


Fig. 7

FIG. 4. Instrumental pyelography showing normal pyelogram on the right side; on the left side peri-renal extravasation of contrast media is seen, due to perforation of renal capsule by the catheter being pushed too high. Filling under screen control eliminates this risk.

FIG. 5. Pyelo-renal 'reflux' due to overfilling, showing bunched appearance of the calyces; also indicating 'filling under screen control' is better.

FIG. 6. Bunch of calcified glands on the left-side; lateral view after pyelogram shows left kidney shadow superimposed over the vertebral body, while the glands are anterior to the vertebrae. Likewise calcified gall stones, pancreatic calculi and calcifications in the costal cartilages can be differentiated from their positions in the lateral view.

FIG. 7. Large coral stone in the left kidney.

Urinary calculi may be visualised on the radiograph when they are of higher density than water, which is accepted as equal to normal soft tissue density of the human body. Those visible are made of cystine, calcium phosphate, calcium oxalate and calcium carbonate. Those not visible on a plain radiograph are the uric acid crystals and xanthine. Calcified abdominal glands, calcifications in costal cartilages, calcified gall stones, and pancreatic calculi, can be distinguished by making oblique or lateral projections. Calcified islands in costal cartilages will be within the shadow of anterior thoracic cage in the lateral view; gall stones between shadows of anterior abdominal wall and vertebral bodies; pancreatic calculi more posterior; renal calculi appear superimposed on the vertebral bodies (or inter spaces) in the lateral view as the kidneys are situated in the recess on either side of vertebral column.

Calcified abdominal glands other than the retroperitoneal ones change position with position of patient, there being no difficulty in recognising the calcified retro-peritoneal glands from their structure and situations. Down in the pelvis, ureteral calculi or calculi in the bladder, have to be distinguished from calcified myoma uterii, phleboliths and even sometimes appendicoliths and faecoliths. Prostatic calculi are numerous and tiny, and superimpose on the symphysis pubis.

Prostatic hypertrophy pushes the lower margin of the bladder upwards, a finger's breadth or more above the upper margin of the symphysis pubis. This is defined by a cystogram (50 to 100 cc. sometimes even 150 cc. of opaque media introduced into the bladder) or a pneumocystogram (by introduction of air) in the A.P. or oblique view when the lateral lobes of the prostate are seen projecting into the bladder shadow,

Fig. 8. 45 minutes after intravenous injection of dye fairly large calculus at the lower end of right ureter causing obstruction hydronephrosis and dilatation of the ureter above. Note normal filled bladder with lower margin parallel and approximating pubic brim. After intravenous injection of Uropan, Diodone or Uroselectan radiographs are taken at 5 min, 15 min, 30 min and 45 min. or one hour intervals. In some cases of hydronephrosis it may be necessary to make radiographs several hours later.

Fig. 9. Retrograde pyelography in a case of T. B. kidney. Note number of small (abscess) cavities filled with contrast media communicating with the calyces, 'daisy' shaped tips of some of the calyces, and the dye reaching the renal capsule through fistulous track from the calyces.

In T.B. of kidneys, healed cases show calcifications in the parenchyma. In active cases, multiple abscess cavities communicating with the calyces may be seen. Clinically, symptoms are less acute than in pyæmic abscesses. In tubercular disease only one or two calyces may show 'daisy' shaped tips on account of destruction, but in pyogenic infections of kidneys, all the calyces are involved.

Fig. 10. Same case—Opposite kidney—normal pyelogram but there is overfilling.

Normal bladder shadow is ovoid, lower margin being parallel to the pubic brim. Diverticula bulge out as pouches and hold the contrast media after bladder is emptied, and when followed by pneumocystogram the finding is made definite. Growths like carcinoma and papillomas of bladder throw characteristic "filling defects." Normal bladder in women throws a crescent shaped impression on the upper margin of the bladder shadow due to pressure on the fundus of the bladder by the uterus; this impression is more pronounced in cases of fibromyomata. In suspected placenta praevia (full term pregnancy) when foetus is presenting by the head, a cystogram will reveal a greater distance between the skull outline and that of the bladder. This is interpreted as space occupied by the abnormal position of the placenta, as normally, the skull shadow should almost approximate and be uniformly near the upper contour of the bladder. When there is hand presentation, the shadow of the hand is seen.

Urethrograms are helpful in diagnosis of strictures, peri-urethral and prostatic abscesses and fistulous tracts. The patient is put on the X-ray table and the bladder inflated with air with the pelvis tilted in an oblique position. Iodipin or Thorotrast jelly is injected with an urethral syringe and while it is seen entering the bladder as observed with the screen, or when there is much resistance to the passage of the opaque media, the radiograph is made. In the oblique position and the penis drawn out and pinched at the tip, the whole urethral tract (penile, membranous, and prostatic portions) is defined on the radiograph. Prostatic lobes are seen projecting into the air-filled bladder.



Fig. 8



Fig. 9

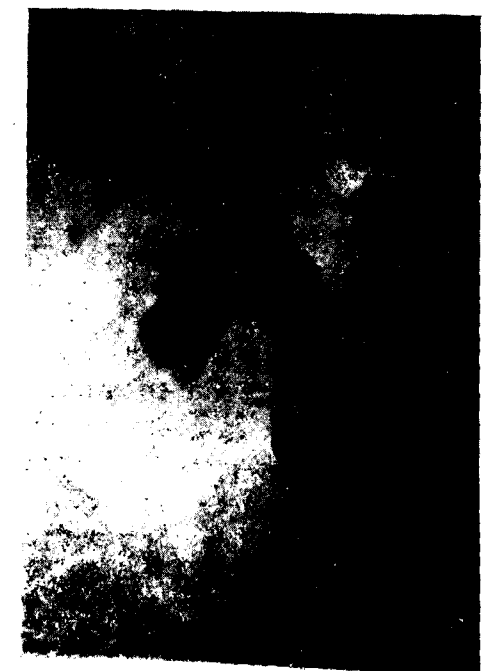


Fig. 10



Fig. 11



Fig. 12

FIG. 11. Calculus at the upper end of the right ureter causing hydronephrosis, right-side; left kidney is hypertonic. In early pyelitis the kidney appears hypertonic—sharp papillae, and narrow sharply outlined calyces and renal pelvis, are defined in the pyelogram.

FIG. 12. Left-side pyonephrosis with calculi—note evidence of destruction.

FIG. 13. Peri-nephritic abscess left-side, caused by calculi; pyonephrosis with perforation—note areas filled with contrast media.

Intravenous urography elicits the function as well as configuration of renal pelvis, calyces and papillae; obstruction due to ureteral calculi or other cause is evident when ureter is dilated above the obstruction and there may be a degree of hydronephrosis. When the finding is not definite or when the kidney shows no excretion, retrograde or instrumental pyelography should be done. 20% Sodium Bromide solution is less irritating than Sodium iodide solution; Uroselectan, Uriodone, and such other preparations can be used. Usually 5 to 10 cc., or rarely 10 cc., may be necessary to fill the renal pelvis. In polycystic kidney or hydro-nephrosis more may be necessary and so filling the renal pelvis on the X-ray table 'under screen control' is safer and better. Risk of 'overfilling' and perforation of renal capsule by the tip of the ureteral catheter pushed too high, causing injury thereby, is avoided.

Developmental abnormalities:—Malformations:—(a) In congenital absence of one kidney or in atrophy, the other kidney is enlarged and hypertrophied.

(b) *Fusion of kidneys:—*The kidneys may form one organ in the median line or form a horse-shoe kidney with convexity downwards.

(c) *Deep lobulation* is occasionally seen. The lobulation may be to such an extent as to divide it in two or more portions.

(d) *Double ureter or pelvis* sometimes occurs which may extend as far as the bladder.

*Congenital displacement of kidneys:—*In this condition the kidney lies over the sacro-iliac synchondrosis or sacral promontory. This is more frequently seen in the left side where the descending colon is displaced inwards, so that the rectum starts to the right of the middle line.

*Movable or floating kidneys:—*Three stages are described—(a) a palpable kidney is the one where the lower half or more can be felt on deep inspiration; (b) a movable kidney is the one in which the upper pole is

Fig. 13

FIG. 14. Inflammatory oedema and occlusion of cystic opening of the right ureter with dilatation of the ureter above, and hydronephrosis; clinically, cystopyelitis.

FIG. 15. Gravid uterus producing 'pressure' hydronephrosis and dilatation of the ureter on the right side (intravenous urography). Five months pregnancy with clinical symptoms of cysto-pyelitis.

Hydronephrosis and dilated ureter can be caused by obstruction to ureter from calculi, cicatrix in broad ligament due to metastatic carcinoma, papilloma of bladder, accidental ligature of the ureter in gynaecological operations, temporary ascending or descending infections (Fig. 14), pressure from the enlarged gravid uterus (Fig. 15) in uterine fibro-myomas, prolapses, and cystoceles. Physiological premenstrual congestion of pelvic organs in females producing hyperemia of ureteral mucous membrane may give rise to symptoms and often diagnosed as dysmenorrhoea. At the cystic opening of the ureter, there is normally a sphincter effect; congenital atony of the ureteral opening, is diagnosed, when during cystography the opaque fluid is observed to pass through the stoma into the ureter. In such cases there is greater likelihood of ascending infection of the kidneys from the bladder.

palpable and it can be restrained from returning to its old position on expiration, and (c) floating kidney is the one which is freely movable in the abdomen in all directions.

Polycystic kidneys (always bilateral) —In early cases, when cysts are not large, no abnormality is seen in the pyelogram. When the cysts grow, pressure on the calyces gives the calyces an elongated and narrowed appearance. Kidney shadow gets enlarged, shows wavy outlines, and later there is dilatation producing hydronephrosis.

Inflammatory diseases:—Pyelitis and Pyelonephritis:—In pyelitis the inflammation is confined to the renal pelvis and in pyelonephritis, there is inflammation of the kidney substance also. This, though usually associated with some obstruction in the urinary tract is also caused by ascending infections from the bladder or infection through the blood stream. (Staphylococci are the primary organisms and bacillus coli predominate in these infections. Schwarz is of opinion that B. coli infection of urinary tract, is acquired during infancy or childhood, after measles and intestinal disease, and that the prognosis is very good in infants. In older children, he observes that the infection does not clear up entirely; further subacute attacks actuated by intestinal disorders continue the infection into adolescence. Recurrent attacks of pyelitis during life time by B. coli is always a re-infection, more often in women, and there is no chronic pyelitis as such by these organisms only. A large number of children do suffer from pyelitis and regulation of bowels will clear the condition; in adults, and, women



Fig. 15



Fig. 14

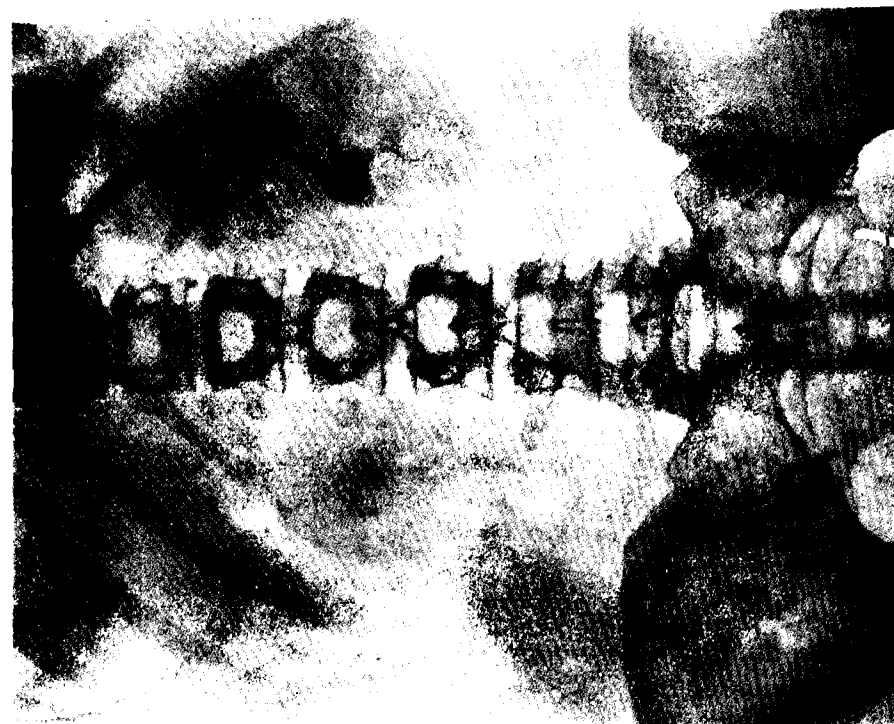


FIG. 16 and 17. Retrograde pyelography.

45 year old lady with symptoms of nephro-lithiasis—intravenous urography (Fig. 16) showed no excretion on the right side, left kidney showed double pelvis. Cystoscopy revealed double ureteral opening on the right side—two catheters were passed—no excretion on the right side for 20 minutes, contrast filling showed double pelvis with negative shadows of multiple renal calculi (Fig. 17).

particularly, he advises habitual constipation should be corrected). The sharp outlines of the calyces and papillae show distortion due to damage by infective organisms at a later stage; abscess cavities in the renal parenchyma (discrete or confluent) opening into the calyces or pelvis are formed, caused by destruction of medulla and cortex. Pyo-nephrosis is the term applied to this advanced stage of destruction when pus pours from the kidneys. Pyaemic infections like multiple abscesses and carbuncles cause an acute form of pyo-nephrosis sometimes. In chronic cases the inflammation is more patchy and the destruction and healing of the renal tissues results in fibrosis and contraction.

Intravenous urography and cystoscopic examination give the following information:

Pyelitis:—Urine—cloudy and purulent; function—normal; X-ray—normal, hypertonic.

Pyelonephritis:—Urine—purulent; function—impaired on account of involvement of parenchyma; X-ray—positive evidence of early changes in papillae.

Pyonephrosis:—Urine—very purulent with clots on account of considerable destruction of renal parenchyma; positive X-ray findings obtained.

Contracted kidneys:—Urine—clear; of low specific gravity; function—very bad; and no X-ray shadows. Patient's end is from acute uraemia.

Hydronephrosis:—This is usually caused by some chronic obstruction in the urinary tract, which may be unilateral or bilateral depending upon the site of obstruction. The earliest change is slight flattening of the pyramids and clubbing of the calyces. Later the pelvis and calyces are dilated to an enormous extent and the cortex destroyed. The ureter above obstruction also dilates. An aberrant renal vessel (congenital) by the consequent kink of ureter, also produces hydronephrosis.

FIG. 18. Lady 28 years old—clinically symptoms of acute pyelitis—intravenous urography shows bifurcation of ureter and double pelvis—upper pelvis is smaller in size. In such conditions the kidney may have two separate capsules or may be enclosed in one large capsule.

FIG. 19. Horse-shoe kidneys—Pyelogram shows dilatation of the calyces with the medial border of the kidneys very near and almost parallel to the vertebral column, and the ureters emerging from the renal pelvis in a more lateral site.

Cysto-pyelitis:—Infection may commence in the bladder and ascend to renal pelvis or it may extend from pelvis to bladder. In chronic cases the bladder wall is hypertrophied and the mucous membrane may protrude outwards between the muscular fasciculi giving rise to pouch-like saccules where phosphatic concretions may be formed. A cystoscopic examination is always indicated in cystitis, which may be caused by calculi, tumours, T.B. and other infections. In women endometrial and vaginal discharges, in men hypertrophied prostate with residual urine, in children invariably T.B. infection, are the usual causes of cystitis. Descending infection when kidneys are involved and ascending infection when primarily bladder is involved cause cysto-pyelitis, the entire upper urinary tract thus getting involved.

T.B. of Urinary Tract:—First arrest of tubercular bacilli is in the glomeruli and cause tiny abscesses and tubercles there. Capillary vessel walls are eroded and bleeding occurs. Haematuria is an initial symptom in T.B. of kidneys. Ureteral catheterisation is an essential procedure to eliminate both kidneys being involved, as also retrograde pyelography. Renal tuberculosis is always secondary to T.B. elsewhere in the system. In the bladder the lesions penetrate deeper into the musculature; scarring and calcium deposits occur in later stages giving a fine mottled appearance on the radiograph in the bladder region. The lesion that starts at the apex of the pyramid extends to the pelvis. Caseation and ulceration leads to extensive destruction and formation of cavities. Infection spreads down to pelvis, ureter and bladder. The kidney may be shrunken and the pus becomes converted into a putty-like mass in which lime-salts are deposited, which can be seen as spotty shadows on the X-ray films. Sometimes the calcareo-caseous outline of the kidney may be seen. The outlines of the calyces and the pelvis are destroyed and distorted, which give a characteristic radiographic appearance. The ureter is usually converted into a rigid thickened dilated tube. Sometimes a tubercular stricture may occur, which will obstruct passage of ureteral catheter, and then, only intravenous urography is possible,



Fig. 19



Fig. 18



Fig. 20



Fig. 21



Fig. 22



Fig. 23



Fig. 24.



Fig. 25.



Fig. 28.



Fig. 30.



Fig. 26.

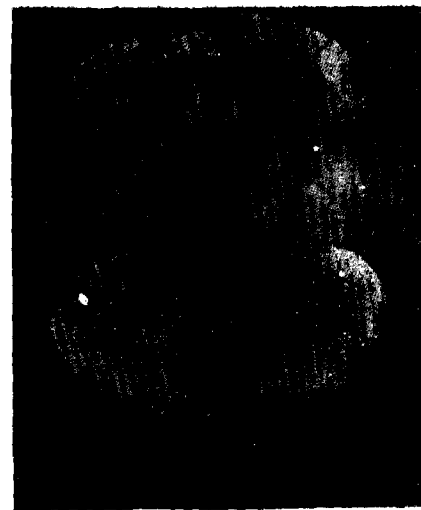


Fig. 27.

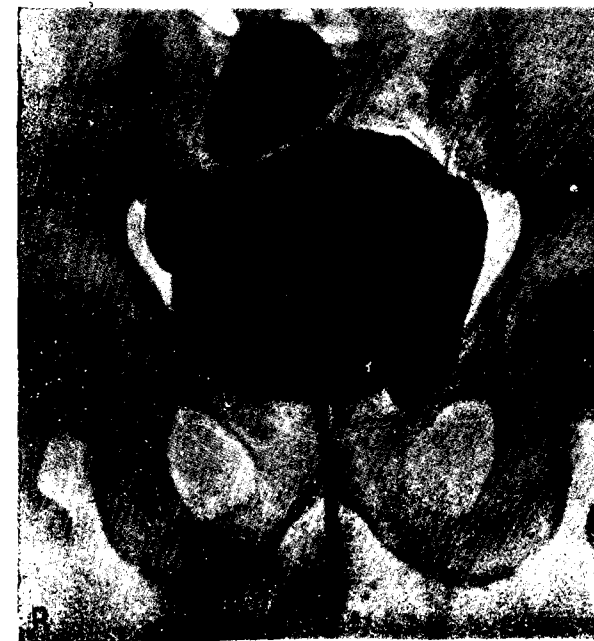


Fig. 29.

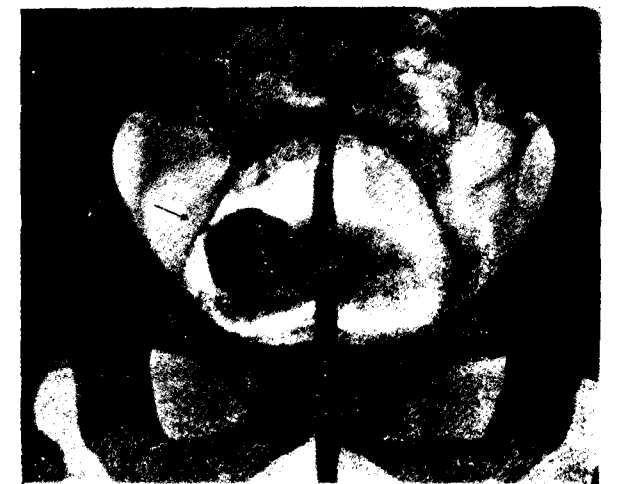


Fig. 31.



Fig. 32.



Fig. 34.



Fig. 33.



Fig. 35.



Fig. 37



Fig. 36



Fig. 38

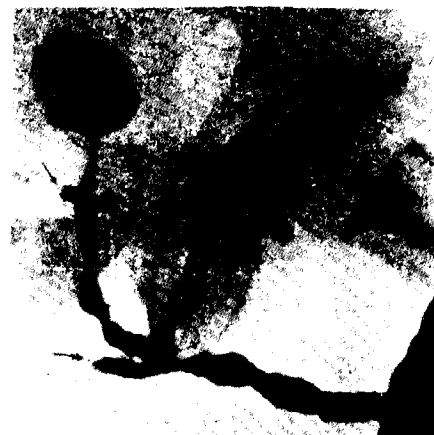


Fig. 39



Fig. 40



Fig. 41



Fig. 42



Fig. 43



Fig. 44



Fig. 45

FIG. 20. Floating kidneys showing bilateral lumbar positions.

FIG. 21. Floating kidney right-side showing hydronephrosis (Sacral position).

FIG. 22. Polycystic kidneys are always bilateral. Note elongated calyces and evidence of pressure from cysts narrowing lumen. Renal shadow appears enlarged, and there is no 'filling defect' of tumour.

FIG. 23. Advanced hydronephrosis in bilateral cystic kidney.

FIG. 24. Hyper-nephroma of right kidney,—note entire involvement of upper part of the kidney—palpable tumour on the right side, symptomless bleeding (confirmed by nephrectomy and pathological examination.)

FIG. 25. Carcinoma right kidney, showing 'filling defect' by the tumour. Symptomless bleeding (confirmed by nephrectomy and pathological examination).

FIG. 26. Pyonephrosis with perinephritic abscess and fistula, right-side (intravenous urography—note the dye coming out through the fistulous tract and the irregular shadow on the right side). Left-kidney appears hypertonic.

FIG. 27. Large oval calculi in the bladder. Note the structure, dense in the centre with layers of salts deposited around.

FIG. 28. Large calculus in the bladder and unusually long calculi in the lower end of both ureters—42 years old—died of uræmia. Autopsy showed the ureteral calculi were 5 cm. and 8 cm. long each and of the thickness of the little finger. The calculus in the bladder was 7 cm. by 4 cm. Section of kidneys showed evidence of pyelonephritis, both sides.

FIG. 29. Cystogram showing 'diverticulum-like' projections of the bladder walls—patient 51 years old.

FIG. 30. Same case, after emptying bladder: three pouchlike diverticula are seen; cystoscopy showed area of bladder between the pouches was extensively contracted on account of scar tissue—patient had been previously submitted to electro-coagulation for papilloma of bladder.

FIG. 31. Pneumocystogram after cystography—38 year old male showing diverticulum of bladder filled with dye—The bladder was filled with air after draining out the contrast fluid—Note the dye-filled diverticulum in contrast to air-filled bladder.

FIG. 32 & 33. Large calculus in diverticulum on the right-side of the bladder obstructing ureteral opening. Intravenous urography (Fig 33, taken 45 minutes after injection) showed very light shadow of renal pelvis on the right-side—Left kidney showed normal pelvis and another diverticulum of the bladder was seen on the left-side near the ureteral ostium (confirmed by operation).

FIG. 34. Carcinoma of the colon with fistula into the bladder. Note the contrast media in the sigmoid loop which shows 'filling defect' and narrowing of the lumen. The contrast media has filled the bladder. Patient complained of passing flatus per urethra.

FIG. 35. 'Filling defect' in the bladder caused by carcinoma involving base of the bladder.

FIG. 36. Extensive carcinoma of bladder showing 'filling defects' and obstruction to both ureteral openings with dilatation above and hydronephrosis (45 min. after intravenous injection of dye).

FIG. 37. Extensive recurrent papilloma of bladder—note extensive 'filling defects' and hydronephrosis, both sides (45 minutes after intravenous injection of dye). Cystoscopy showed extensive involvement of bladder wall. Operated upon and growth electrocoagulated ten years previously; pathological report: villous papilloma, no carcinoma; no radiation therapy given at the time.

FIG. 38. Calculus in the urethra—these are invariably those stuck in the passage in the process of expulsion, and not formed there as such.

FIG. 39. Urethrogram showing peri-urethral abscesses in lower bulbous portion, and prostatic abscess cavities filled with contrast jelly, (history of gonorrhœa 20 years previously and the sequelæ).

- FIG. 40. Large peri-urethral abscess cavity—irregular margins of cavity are defined (history of chronic gonorrhoea of 22 years' duration, and sounds having been passed number of times for stricture).
- FIG. 41. Large prostatic abscess cavity with fistula into urethra filled with opaque jelly.
- FIG. 42. Extensive stricture with peri-urethral abscess and fistula filled with opaque jelly.
- FIG. 43. Old stricture $1\frac{1}{2}$ cm. long, prostate very much enlarged pushing bladder upwards. Note length of narrowed prostatic portion of urethra, ending with the mass of opaque jelly in the bladder indicating size of the enlarged prostate. Contrast media is also seen entering enlarged vascular and lymphatic channels.
- FIG. 44. Traumatic stricture of urethra—it was not possible to pass sound or catheter.
- FIG. 45. Contrast filling of seminal vesicles with thorotrast through the ductus deferens.

Tumours. Hypernephroma:—This is now considered to be renal carcinoma arising from adult tubules or from nephrogenic tissue which have persisted in the renal cortex. This tumour usually affects the upper or the lower pole and attains a large size. Pyelogram shows 'filling defects' in the involved portions and the rest of the kidney shows normal configuration.

Embryoma or Wilm's Tumour:—This is common in childhood and arises in the cortex and tends to destroy the whole kidney. Intravenous pyelography shows a complete absence of the normal roentgenogram shadow.

Epithelioma of kidney, renal papillomas and polyps show intrinsic "filling defects" in the pyelogram without distorting the gross appearances on the radiograph.

Papilloma of the bladder is situated near the trigone, and appear as floating tufts or villous processes projecting into the bladder cavity.

Carcinoma of the bladder is usually due to malignant change of the villous papilloma. When it arises in the posterior wall, it projects into the bladder cavity as a soft spongy mass. Involvement of the ureteral opening leads to hydronephrosis.

As far as present knowledge goes, retrograde and intravenous pyelography, cystography, pneumocystography, and urethrography, have their limitations and indications; when these are borne in mind by the clinician and radiologist, further progress can be made in radiological diagnosis of urological conditions. Intravenous urography does not abolish the study of the urinary tract by the ascending route, each method having its own advantages and inconveniences.

INTERESTING CASE REPORTS

A Case of Neurofibroma in the Thorax

MAJOR D. KANAKASABESAN, M.S., F.R.C.S., SURGEON, MADRAS,
AND RAO BAHADUR DR. P. RAMA RAU, D.M.R., RADIOLOGIST, MADRAS.

A HINDU, male, aged 22, attender by occupation was admitted on 1-11-1947 with a complaint of swelling in the right side of neck and chest and hoarseness of voice since 2 months.

Previous illness or injuries:—Nil relevant. No trauma or fall; has been having a dry cough since 3 months.

Present illness:—Two months back casually noticed a lump size of a time in the right supraclavicular fossa. Painful only on pressure. Then noticed a change in the voice. Consulted a private doctor; got X-ray exposures and took some pills, daily for 5 days. Swelling reduced, voice improved. Fortnight later swelling increased, voice became husky again, and so came to hospital.

General condition on admission:—Poorly nourished, weight 96 lbs. height 5 ft. 7 inches, tall and thin, slightly anaemic, slight pyorrhoea.

Local condition:—Prominent swelling over the medial half of the right clavicle with fullness of the right supraclavicular fossa and fullness of

the right side of the chest upto the nipple line. A corresponding bulge is also seen on the back over the right intervertebral space. The skin over was not stretched or shining; no prominent veins over the swelling. The neck swelling extends laterally up to the posterior border of sternomastoid and does not move with deglutition; both inner ends of the clavicles can be moved up and down; an ill-defined bony mass can be palpated at the first costo-chondral junction; the thyroid gland was normal except for the right sided fullness. The trachea was displaced to the left at the root of the neck. The radial pulse was equal on both sides and of normal volume and tension. The pulse rate was 108, there was no respiratory distress or cyanosis; no tracheal tugging felt. Both pupils were equal and reacting to light and accommodation. Patient had a brassy cough with scanty mucoid expectoration and voice was very hoarse being scarcely more than a whisper.

Patient had a scoliosis with a marked convexity to the left. The muscles of the right shoulder girdle were slightly wasted and the right



Fig. No. 2. Left Anterior Oblique View.

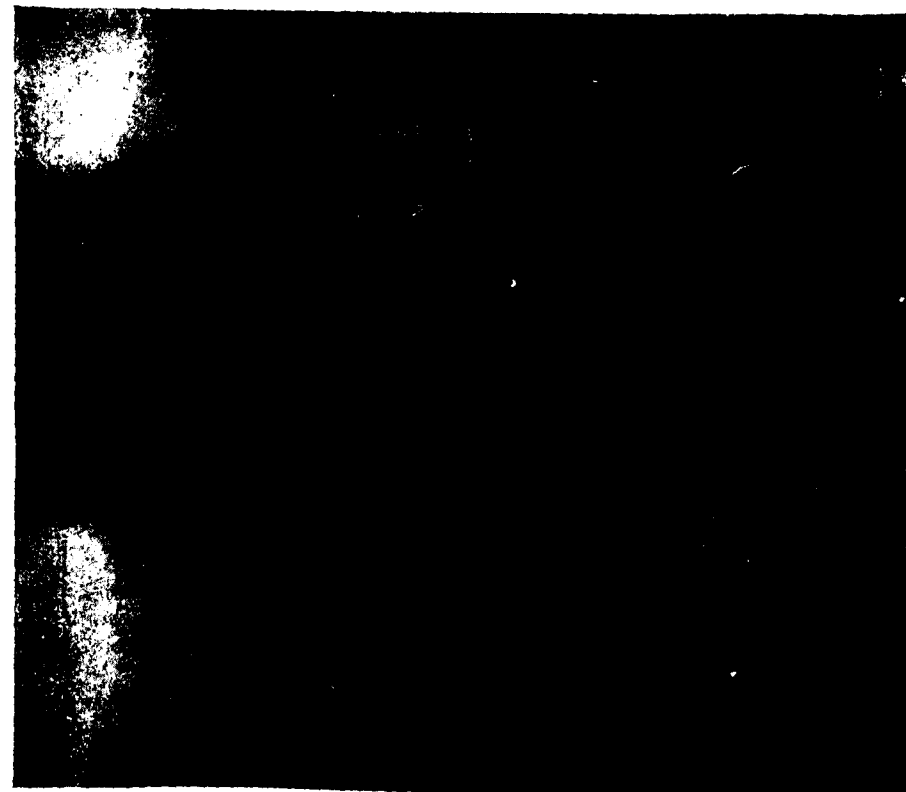


Fig. No. 1. Antero-Posterior View.

scapula appeared to be on a higher level. The arm and forearm muscles were however normal and equal with no fibrillary twitchings; power and tone normal, reflexes normal; no sensory disturbances; chest examination nil abnormal except for diminished breath sounds over the base but no adventitious sounds; heart sounds normal.

Findings : 1. Urine; sp. gr. 1012, sugar nil, albumin nil.

2. Blood R.B.C. 4.2 million, W.B.C. 7200; Hb. 80%.

3. Blood pressure	Sys-tolic	Dias-tolic
4/11	Rt. 110	80
	Lt. 114	80
21/11	116	70
11/12	110	70

4. Blood: W. R. and Kahn negative.

5. Sputum: (a) Negative. (b) Concentrated method: negative. (c) No malignant cells observed in sputum.

6. Blood sedimentation rate—8 mm. at 15'; 35 mm. at 45'.

7. B.M.R. plus 1.8%.

8. E.N.T. report: Middle line paralysis of right vocal cord.

Radiological findings.—*Upper thorax A. P. view:*—Well defined homogenous opacity of tumour with regular outline, oval in shape, occupying upper part of right hemithorax and right half of superior mediastinum, pushing the trachea and oesophagus to the left. Thoracic

portion of trachea also appears elongated and its bifurcation also is lower than normal on account of pressure from the tumour. The bifurcation of trachea appears to be at the level of the upper part of the body of the seventh dorsal vertebra. Vertebral bodies in the region show left-sided scoliosis with secondary spondylitic changes. There is also a cervical rib seen on the right side. The medial half of the right clavicle appears deformed and its articular end with the sternum is not defined. So also the anterior end of the first rib and its synchondrosis with the sternal portion of cartilage. Heart and great vessels are displaced downwards.

Left anterior oblique view shows evidence of narrowing of the air space of trachea right along the extent of the tumour, so that there is evidence of compression from the front backwards and to the left. This degree of narrowing is not seen in the A.P. view.

Screening :—Showed restricted respiratory excursions of right hemidiaphragm as compared with the left; but no paradoxical respiratory excursions one obtains in cases of pressure on the phrenic nerve. Restricted respiratory excursions on the right side is apparently due to less air entry into the right lung on account of large part of upper hemithorax being occupied by the

tumour. The oesophagus on barium swallow showed no particular deviation other than that with the trachea upto its bifurcation.

X-ray evidences indicate a cystic growth, starting in the right paravertebral recess, producing scoliosis as it enlarged, later extending to upper part of right hemithorax and the superior mediastinum—congenital, producing anatomical changes during adolescence as it enlarged.

Operation:—Preliminary transfusion of whole blood 300 cc. on 17—11—1947

Operation 1—12—1947, under intratracheal gas oxygen and cyclopropane.

Operation: *Anterior mediastinotomy*. A low collar incision was made, the pre-laryngeal muscles divided, and a globular encapsulated pedunculated tumour was revealed. The pedicle which appeared to be attached to the thyroid isthmus was divided between ligatures and an effort made to enucleate the tumour within the capsule. This was ineffectual as the tumour was very big and the lower pole could not be reached by the finger; a vertical incision was made in the middle line and the sternum was split right up to the junction of the body with the ensiform; the split edges were widely retracted and the tumour was shelled out of its capsule; the lower portion of the tumour appeared to be undergoing mucoid degeneration and was easily separated from the capsule, the rest of the tumour was hard and heavy. There was only slight oozing from the bed, the pleura was not damaged; the split edges of the ster-

num were united with wire sutures, and skin wounds were closed with interrupted sutures. A small rubber-dam drain was left at the centre of the collar incision. (Specimen was 15 c.m. long and weighed 380 grams).

During the operation the patient was given 700 cc of blood.

Post-operative convalescence:—A saline drip was instituted for 24 hours and patient put on Penicillin 20,000 units three-hourly for 6 days. There was a moderate rise of temperature up to 102°F for 4 days and the patient had cough and profuse expectoration of frothy mucopurulent sputum. Oxygen was administered through a B.L.B. mask. Physical examination showed no air entry in the right base and axilla and was tympanitic on percussion. The drainage tube was removed at the end of 48 hours. The temperature came down on the 5th day to normal and there after showed slight evening rise of about 1 degree in the afternoon. On the 10th post-operative day, patient was completely afebrile and stitches were removed and the wound had healed by first intention.

Chest examination still showed deficient expansion of the lung on the right side over the tumour area and X-rays confirmed this. There was no dyspnoea or respiratory distress however. The pulse rate was 80 and respiration 20 per minute. The voice though improved was still hoarse. His general condition showed steady improvement and periodical X-rays revealed gradual expansion of the lung.

Pathological report on section made was "neurofibroma."

A Case of Pellegrini Stiedas Disease

DR. BRIJNANDAN LALL, M.D., D.M.B.E.,

LECTURER, RADIOLOGY DEPARTMENT, K. G. MEDICAL COLLEGE, LUCKNOW.

Mr. M. H., 45 years, overseer, was referred to us by the Civil Surgeon of a district for skiagraphy of the knee joint to investigate the cause of his limping.

He had the following complaints:—

(a) Shooting pain on the medial side of right knee.

(b) Limping and difficulty in walking.

(c) Wasting of his right lower extremity.

(d) Occasional attacks of fever.

History of present illness:—10 years back he was hit by a horse when he was trying to save some persons who were involved in a tonga accident. He had then some pain in his right knee which passed away after some time.

4 years back he fell down from a horse and the right side of his body was hit against the ground. Since then he gets shooting pain on the medial side of the right knee. He is unable to walk, cycle or ride. Since then he is also noticing that his right lower extremity is getting thin.

On clinical examination:—The right lower extremity shows definite wasting as compared to left. The hollows round the knee-joint were quite marked. There is definite tenderness present on the medial side of the medial condyle of femur. Extension movement is limited by 10°. Flexion movement is complete. On passive movement of the joint a creaking sensation is felt and the

patient suddenly holds his leg due to pain.



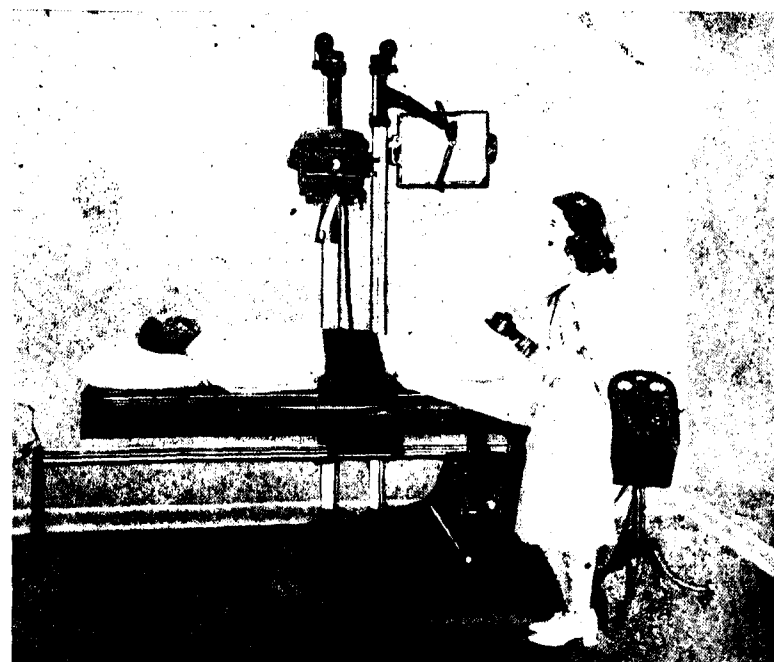
Fig. A.P. View.

X-ray shows ossification of the internal lateral ligament of the knee joint near its attachment to femur.

Pathology:—When as a result of trauma the internal lateral ligament is avulsed from its femoral attachment, the site of its attachment is elevated and the subperiosteal haematoma undergoes ossification. Spicules, spurs or plaques of bone are formed. This new bone formation is called Pellegrini Stieda's disease, but is in no way different from the ossification which occurs at the periosteal attachment of any ligament or tendon which is avulsed. It is not a disease of obscure origin, but a simple example of traumatic ossification.

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The Indian Journal of Radiology

Vol. II.

NOVEMBER, 1948

No. 4.

EDITORIAL

What of the Future?

DR. K. P. MODY, B.A., L.M. & S., F.C.P.S. (Bom.), D.M.R. (Eng.),

DIRECTOR, DEPT. OF RADIOLOGY, TATA MEMORIAL HOSPITAL, BOMBAY.

MY term of office as President of the Association will shortly come to an end. One of the duties attached to the chair is to contribute an editorial in the first and last issues of our Journal, and it is my great privilege to write a few words as a farewell message to my friends and colleagues, the members of the Indian Radiological Association. At the outset I offer my sincere thanks to my colleagues on the Central Council and others for their co-operation and close collaboration during the year.

1948 has been a memorable year in the history of our country. It was only the other day that we celebrated Independence Day, the first anniversary of India's freedom. It has been a period of great stress and strain, a year of "blood, toil and tears". Our leaders were called upon to deal with problems of immense magnitude, which they have tackled with untiring energy and great ability. Vast upheavals, social, economic and political have undermined the spirit of the people, and have created amongst other things a financial stringency, which has deprived the masses of many of the benefits that were anticipated as a result of our emancipation from foreign rule.

The first and foremost fundamental duty of Government is the question of the health of the people. There was a time and not very long ago when our leaders sat on the opposition benches and blamed the Government of the day for their neglect of fundamental Health Services,

They raised their voice in bitter criticism at the placid attitude of Government towards questions of Health and at the meagre grants that were allotted for the health services. What have we done so far after the reins of Government have passed into our hands? We have planned and planned but unfortunately owing to circumstances beyond control very little has so far been achieved. The state of civilisation of a country can be gauged from the incidence of preventable diseases and the general standard of health and nutrition. Judged from this standpoint, India is in a backward stage. Malaria, epidemics of infectious diseases, such as Typhoid and Cholera malnutrition, premature decay and death are rampant. Cancer and tuberculosis are problems affecting the whole world, but whereas all out efforts are made to combat them in other countries, we have so far not even touched the fringe of the problem. Decades will be necessary and millions will have to be spent before tangible results will be obtained. Preventable diseases must be prevented, every man, woman and child must have facilities for modern treatment including ample hospital accommodation with departments for specialised investigations. The millenium is still far, difficulties are overwhelming. The social and economic condition of the masses is deplorable, educational standards are too low, ignorance and superstition are rampant. So long as these conditions persist, so long as the standard of living of the people is not raised, so long as the national conscience is not roused, so long shall disease and death stalk the land.

Radiology has a great part to play in the future set up of medical relief. Every hospital however small, every Government dispensary however far from the main cities should have facilities for at least simple X-ray investigations. Small units, portable and mobile, should be made available for outlying districts and small hospitals. During the war ambulances fitted with X-ray units, complete in every detail, played a great part in the treatment of the sick and wounded wherever they were. One great object that will be fulfilled by such installations will be the detection of Tuberculosis, the arch enemy of mankind. It is the experience of all that Tuberculosis often masquerades as Malaria, Bronchitis or Typhoid, a fatal mistake which could be easily cleared up by a simple screen examination.

When last we met in Bombay a great deal of talk was indulged in about the necessity of mass radiography in our country. Great hopes were held out that before long such facilities would be available. It is very regrettable that nothing has been done so far. The importance of mass radiography as a potent weapon for combating the scourge can scarcely be

overstressed. At a comparatively small cost invaluable data can be made available which could be of immense help in our fight against the disease. Early cases can be detected at a stage when appropriate treatment would be effective, advanced and open cases which are a menace to the public could be weeded out and segregated in suitable hospitals and sanatoria.

India is in dire need of medical men, there are too few for the vast area of the country and for its teeming population. We have 45,000 doctors for a population of 400 millions, 1 doctor for 8,500 people. Contrast this with American standards where they have 150,000 doctors for 150 millions, 1 doctor for 1,000 of population. Obviously more and more teaching institutions will be necessary more particularly when our medical services will be fully expanded. In no branch of Medicine is the scarcity so great as in the specialised field of Radiology. Many more radiologists will be required in the future schemes of medical relief. We should look ahead and plan for the time when such a large demand will arise.

Specialised training in Radiology to our graduates should be given in accordance with the type of work that they are expected to engage in. For those who are to serve the smaller institutions, the cottage hospitals and the district dispensaries, a short intensive course in clinical radiology of 3 to 4 months should suffice. He will be expected to do routine medical duties over and above minor radiological work. The standard of training should be the same as is given to graded specialists in the army. The next great group comprise the men who are to take charge of special departments in the bigger hospitals. These will be men with the qualifications of D.M.R. of our Universities. In view of the rapid strides of progress during recent years in the Science of Radiology, the standard of teaching and examinations in these diplomas awarded by different Universities should be raised and as far as possible should be uniform. Moreover higher degrees should be instituted, such as M.D. and M.S. in Radiology. Men with higher qualifications will take charge of X-ray Departments in the teaching hospitals in the big cities, such as Bombay, Madras and Calcutta. When mass Radiography comes in routine use, specialised training will also be necessary, a subject by itself. Such then would be a tentative scheme for the education of our graduates in Radiology so that when Medical Services are expanded we shall be able to play our part and play it with credit to our profession. Everyone of us must realise that no medical relief measures can be planned on a scientific

basis without the inclusion of an adequate radiological service, Medical Science without the assistance of Radiology would be glorified quackery.

It is very gratifying to note that during recent years X-rays are being used more and more and very rightly so. Necessarily our responsibilities to the Public must engage our earnest attention. It is a deplorable fact that X-rays are being used by men who have hardly made a study of the subject, whose knowledge of the technical side is derived from manufacturer's catalogues and sketchy descriptions in text books. Such practice, it is scarcely necessary to emphasise, is reprehensible and brings the science into disrepute, and so far as therapeutics is concerned, is positively dangerous. It is a serious charge to make that many institutions who deal with a large number of cases requiring the skilful administration of therapeutic exposures do not possess the necessary facilities for a scientific approach to the problems confronting them. We need the services of qualified Physicists. We have not so far taken steps to institute training for such specialised work. We have amongst our University graduates brilliant men with science qualifications, who could easily be trained for our special work, and who could help us in standardising our equipments and planning out precise methods for adequate treatment of the patients. The subject requires our immediate attention.

It is a gratifying feature that our Journal has kept up its high standard and is being recognised as the official organ in foreign countries. Our membership has been enriched by the addition of eminent names in our profession, and we are invited to take part in the International Congress to be held in London in 1950. The 3rd Indian Congress of Radiology will shortly be held at Calcutta. I would earnestly urge upon our members to attend this meeting in large numbers. Nothing helps the progress of Science more than such meetings with their opportunities for free and open discussions on subjects of common interest. Apart from social contacts made on such occasions, we have opportunities of seeing the work of colleagues, and visiting different institutions and hospitals, in such an important centre as Calcutta, the one time Capital of India, the city of palaces and parks, thriving with trade and industry.

We offer our congratulations to the President elect for the next year. Let us hope that it will be an era of peace and prosperity so that our Government will be able to devote their energies to tasks of national importance, the most immediate being the health and well-being of the masses.

PROGRAMME

THIRD INDIAN CONGRESS OF RADIOLOGY, CALCUTTA, 1948.

(In Joint Session with the Annual Conferences of the Indian Medical Association—Silver Jubilee Session, the Cardiological Society of India, and All-India Medical Licentiates' Association).

Venue—Calcutta Medical College Hospital Compound.

N. B. Delegates' Camp will open in the morning of the 24th Dec. '48.

24-12-1948—Friday

- 9 a.m. to 2 p.m. Registration of Delegates at the Bengal Radiological Association Booth in the General Reception Committee Office, in the Medical College Compound.
- 2-30 to 3-30 p.m. Central Council Meeting.
- 3-30 to 4-30 p.m. Annual General Meeting.
(Lecture Theatre—School of Tropical Medicine).
- 4-30 p.m. Tea—Host Rao Bahadur Dr. P. Rama Rau, President-elect.
- 5-30 to 6-30 p.m. Continuation of the Annual General Meeting (if necessary).

25-12-1948—Saturday

- Morning & Afternoon
- 9.30 a.m. to 12.30 Joint inauguration of the 25th All-India Medical Conference and of the other Conferences.

Interval for Lunch

- 2-30 to 4 p.m. Opening of the Exhibition.
(Detailed programme will be published in the journal of the Indian Medical Association)

Interval for Tea

- 5 p.m. to 8-30 p.m. **Third Indian Congress of Radiology.** (Main Pandal)
- Inauguration of the Congress:

- (i) Chairman's Welcome Address—Capt. R. P. Banerji.
- (ii) Inaugural Address—Major General A. C. Chatterji,
Director of Health Services, West Bengal.

Address by the Retiring President.

- (iii) Introduction and Installation of the Incoming President—Dr. K. P. Mody.
- (iv) Address by the newly Installed President—Rao Bahadur Dr. P. Rama Rau.

Inauguration of Sir Jagadish Memorial Lecture:

- (v) An Address on the Life and Work of Sir Jagadish Bose—Dr. D. M. Bose,
M.A., Ph.D., Director of the Bose Institute.

- (vi) Memorial Lecture—Dr. A. E. Barclay, F.R.C.P., Chief of the X-ray Section,
Nuffield Institute for Medical Research, Oxford.

- (vii) Presentation of the Memorial Lecture Medal.

- (viii) Vote of Thanks—Past President Dr. M. D. Joshi.

- (ix) Announcements if any—Congress Secretary Capt. M. Mukerjee.

- 26-12-1948 - Sunday :** (School of Tropical Medicine, Lecture Theatre).
10 a.m. to 1 p.m. Scientific Session of the Radiological Congress.
Interval for Lunch
2.30 p.m. to 5 p.m. Scientific Session (Contd.).
- 27-12-1948 - Monday**
9 a.m. to 12 Noon. Scientific Session.
12-15 to 1 p.m. New Central Council Meeting.
Interval for Lunch
Visit to Institutions after lunch, or
Attendance at the Open Session of the Indian Medical Conference.
- 28-12-1948 - Tuesday**
Felicitations to Dr. B. C. Roy, Premier of the Province and
Concluding Session of All Conference.

Besides the above, every night after dinner there will be entertainments at the Main Pandal, details of which will be published in the Joint Programme of all the Conferences.

List of Contributions to the Scientific Section of the Third Indian Congress of Radiology.

1. Case of fistula between ureter and sigmoid. Healed for several years (with skiagrams) ... Dr. Tren.
2. Neuropathic Joint diseases (with skiagrams) ... S. N. Deboo.
3. Ewing's Bone Tumours (with prints and skiagrams) ... V. Vorah.
4. Radiological Findings in Eosinophilic lungs (with skiagrams) ... T. K. Dayala.
5. Rugae-Studies of the Gastro-Intestinal Tract (with lantern slides) ... P. Rama Rau.
6. Radiological Findings in some cases of "epigastric" pain (with skiagrams) ... P. K. Guha.
7. Culture of Living Tissue (with Running commentary on cinematographic demonstration) ... R. F. Sethna.
8. Treatment of Mitral Stenosis with Deep X-Radiation (with skiagrams) ... H.O. Gunewardene.
9. Radium in Eye diseases ... M. D. Joshi.
10. A comparative five-year and ten-year salvage of carcinoma cervix uteri by Radical Vaginal operation and radiation with a cinematographic film on carcinoma of the cervix uteri treated by Radical Vaginal operation ... Subodh Mitra.
11. Demonstration of Interesting Films by many of the Delegates.

Promised Contributions.

1. Physical aspects of Radiation ... Sri V. Krishnamoorthi
2. " " " ... Bal Krishna.
3. On X-Ray films ... Dr. M. Mani.
4. On Medical Radiology ... K. Manjunath Rai
5. Experience with Superficial X-ray Therapy in Diseases of the skin ... M. Mukherji.

CAPT. M. MUKHERJEE,
Secretary & Treasurer, Reception Committee,
Third Indian Congress of Radiology, Calcutta.

Department of Scientific and Industrial Research

Time-Table of forthcoming Scientific and Technical Conferences

The following is a Provisional list of the Scientific and Technical Conferences which will be held during 1949, 1950 and 1951 in Great Britain and other places. Members interested in attending any of these Conferences are requested to get in touch with: W.R.L. WICKHAM, Representative, India, British Council, 74 Eastern House, Hansingh Road, New Delhi, who will be able to furnish further Particulars.— G.L.S.

Compiled for the Working Party of the Standing Committee of the British Commonwealth Scientific Official Conference

Date of Conference	Title of Conference	Name of Convening Body	Place of Meeting
1949			
January	Winter Meeting	British Grassland Society	Newcastle.
Feb. 2-23	7th Pacific Science Conference.	Royal Society of New Zeland	Auckland and Christchurch.
Feb. 8 onwards.	International Civil Aviation Organization, Air Line Operating Practices Operations Division.	International Civil Aviation Organisation.	Montreal.
Feb. 22 onwards.	International Civil Aviation Organization, Airworthiness Division.	International Civil Aviation Organization.	Montreal.
May 16-June 3.	U. N. Scientific Conference on Conservation and Utilization of Resources.	ECOSOC	U.S.A.
May	International Railway Congress.	International Railway Congress Association, Brussels.	Lisbon.
July	Summer Meeting	British Grassland Society	S. E. England.
July 9-23 (Proposed).	4th Empire Mining and Metallurgical Congress.	Empire Council of Mining and Metallurgical Institutions.	London and Oxford.
July 21-29	2nd International Congress of Crop Protection.	International Union of Chemistry.	London.
July	Commonwealth and Empire Conference on Tuberculosis.	National Association for the Prevention of Tuberculosis.	London.
Summer	Congress of Psychotechnics	National Institute of Industrial Psychology.	Berne.
Aug. 15-19	12th International Dairy Congress.	International Dairy Federation.	Stockholm.
Aug. 19-25	1st International Biochemical Congress.	Biochemical Society	Cambridge.

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Date of Conference	Title of Conference	Name of Convening Body	Place of Meeting
1949			
Aug. 31—Sept. 7.	British Association for Advancement of Science Annual Meeting.		...
Aug. and Sept.	Specialist Conference on Plant and Animal Nutrition in relation to Soil and Climatic factors.	Council for Scientific and Industrial Research (Australia).	Australia.
Sept. 6-10	15th General Conference.	International Union of Chemistry.	Amsterdam.
Sept. 14-16	General Assembly.	International Council of Scientific Unions.	Copenhagen.
October	The 5th International Animal Husbandry Congress (Zoo-technical).		Paris.
Undecided	3rd International Conference on the Chemistry on Cements.	Bureau of Standards	Washington.
Undecided	Conference on Cosmic Rays.	Cosmic Ray Commission of the International Union of Physics.	Europe.
Undecided	5th International Grassland Congress. Date and Programme not yet fixed.		Netherlands.
1950			
Summer (dates Undecided)	6th International Congress on Radiology.		London or Cambridge.
July 24—Aug. 1.	4th International Congress of Soil Science.	Netherlands Society of Soil Science.	Holland.
Aug. 30—Sept. 6.	International Congress in Mathematics.		Cambridge U.S.A.
Undecided	3rd Pan-American Mining Engineering and Geology.		U.S.A.
Undecided	18th International Congress of Physiology.		Copenhagen.
Undecided	International Congress of History of Science.	International Union of Historical Sciences.	Bucharest.
Undecided	General Assembly.	International Union of Biological Sciences.	Stockholm.
July	4th Plenary World Power Conference.	World Power Conference.	London.
Undecided	5th International Congress	International Union of Biological Sciences.	Rio de Janeiro.

Date of Conference	Title of Conference	Name of Convening Body	Place of Meeting
1950			
Undecided	7th International Botanical Conference.	International Union of Biological Science.	Stockholm.
Undecided	British Association Annual Meeting.	British Association for the Advancement of Science.	Birmingham.
Undecided	International Congress on Ophthalmology.		London.
Undecided	Commonwealth Agricultural Bureau. Review Conference.	Commonwealth Agricultural Bureau.	...
1951			
February	4th Congress of Large Dams.	International Commission on Large Dams of World Power Conference.	New Delhi.
Sept.	12th Congress and 16th Conference.	International Union of Chemistry.	Washington and New York.

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5006 Part to adopt Back to table.

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3. Besides these, there are developing tanks, metal frames, Films pack, chemical etc. etc.

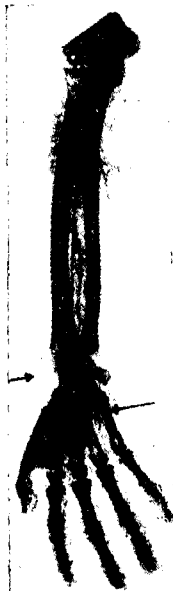
OBITUARY.

We regret to record the untimely demise of MAJOR M. V. SARMA of Calicut (one of our members) on 27th October, 1948. Our deep sympathies to the members of the bereaved family.

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Printed by Dr. U. KRISHNA RAU, Proprietor of the "ANTISEPTIC" at the Antiseptic Press, Madras,
and Published for the Indian Radiological Association by Rao Bahadur Dr. P. RAMA RAU, General
Secretary, 155-157, Poonamallee High Road, Kilpauk, Madras.