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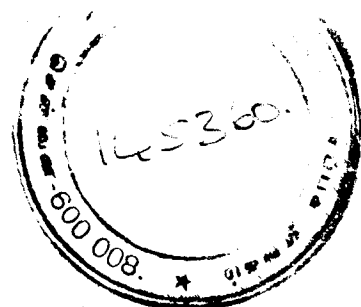
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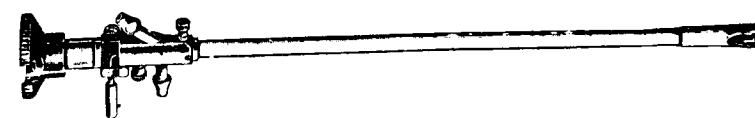
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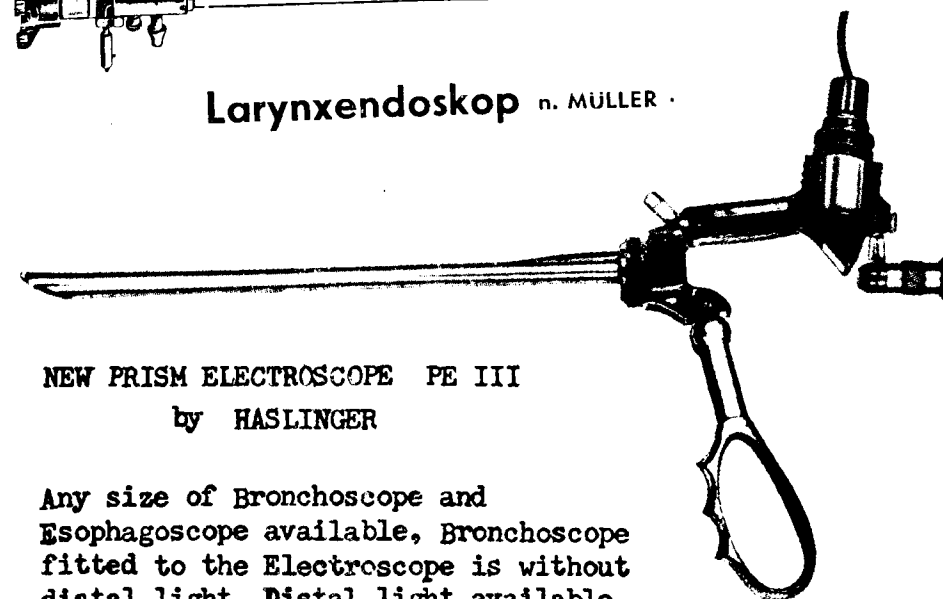
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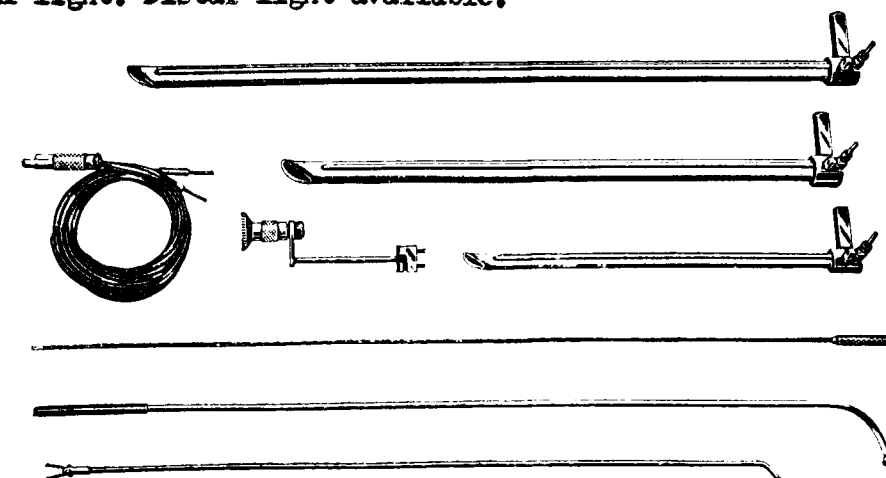


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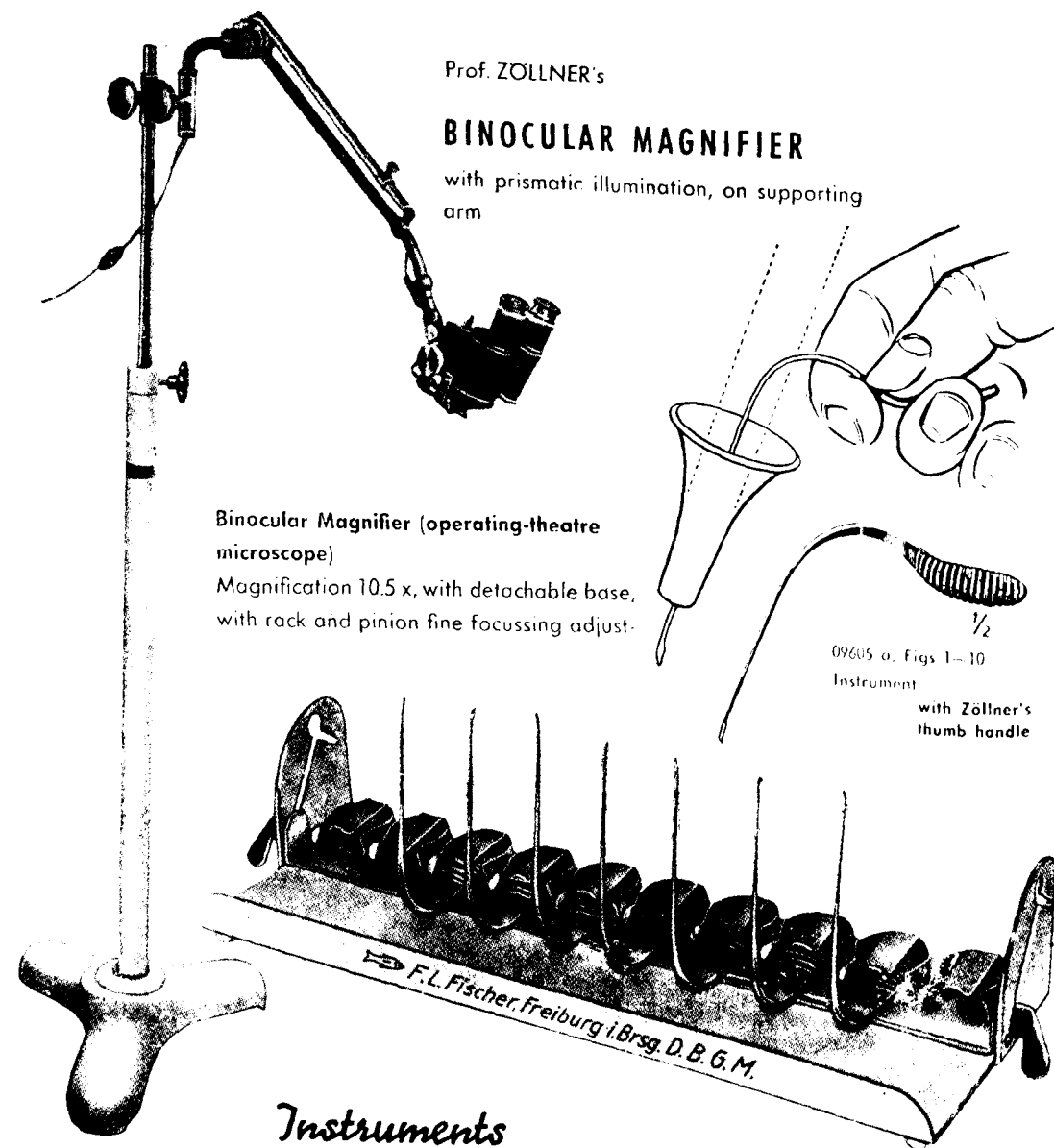


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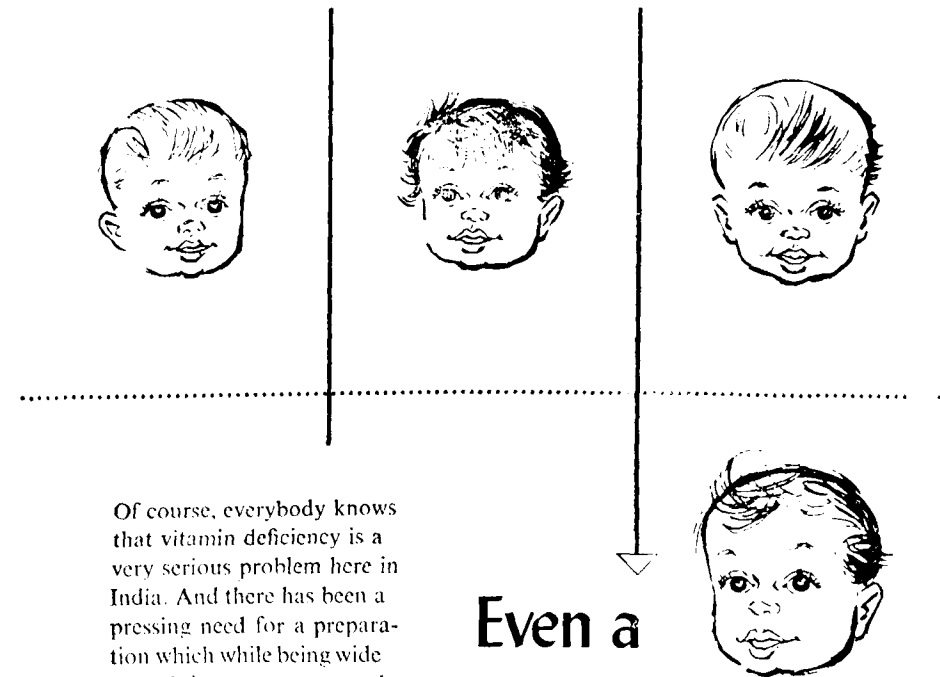
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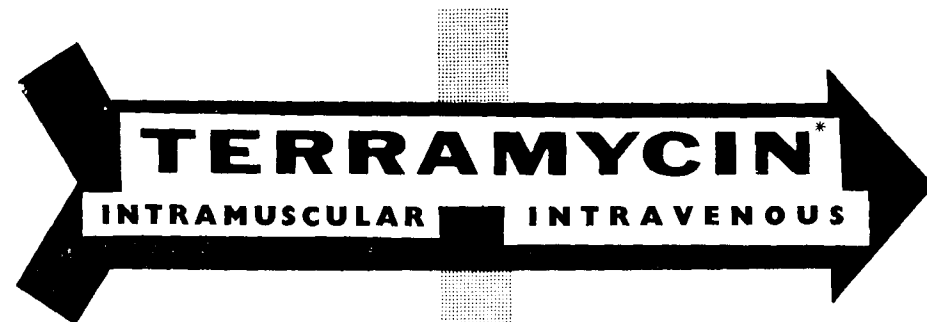
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Evolution of Endaural Surgery

BY

G. LAKSHMIPATHI, M.S., D.L.O.

Visakhapatnam.

From the time Riolan opened the mastoid in 1649 in an attempt to relieve deafness, surgical attack on the temporal bone in the treatment of chronic disease of middle ear has engaged the serious attention of many distinguished otologists. The past hundred years have witnessed the greatest strides in this surgery both on the Continent and in America. In the surgery of temporal bone there are two approaches open to the otologist—the conventional post-aural and the endaural. Recently Popper has described a transtympanic approach through an ante-tragal incision; a transmeatal approach is described by Tumarkin; and a supra-auricular approach is also advocated by some. But there is an increasing evidence that of these various routes the endaural technique has come into its own and is being increasingly practiced by the otologists throughout the world. This has been largely due to the magnificent work of Julius Lempert of New York, and he has been rightly acknowledged as the Father of Endaural Surgery. He has perfected the approach by working out the details of the procedure and though we find an occasional deflection from this technique, his incisions have been adopted as the standard in most otological clinics. The development and perfection of this endaural technique has in fact played a major role in the development of modern temporal bone surgery.

Endaural approach in temporal bone surgery is not a new one nor is it so young as it appears to be. Otologists all over the world have employed endaural procedures to a greater or lesser degree without a particular title or an organised technique. This may have been for creating or connecting perforations, substituting others for better drainage, removal of polypi or granulations, biting off portions of tympanic or attic overhang, removal of necrosed ossicles, or for even removing the anterior tympanic wall. Thus attempts are made to utilise this approach for getting access to middle ear from a long time and the present day technique should be regarded as the edifice built on both the failures and successes of these early pioneers.

The first to do a successful mastoid operation by the intra-aural route is the Senior Theis in 1907. However this pathway has been utilised by earlier workers from 1870, as by Kessel of Jena (1871), Schwartz (1876), and others in operating on the middle ear in the treatment of deafness and tinnitus by removing adhesions, removing the ossicles and portions of sulcus tympanicus. Facial paralysis and troublesome haemorrhage were great set backs in these early attempts. In 1887 Stacke criticised this technique as a blind procedure and this influenced the subsequent workers greatly. Kessel was probably the first to expose and enter into the mastoid antrum through this route. His operation done in 1885 consisted of two parallel incisions five to six millimeters long through the skin of the upper canal wall from the tympanic margin laterally. Skin and periosteum were removed, carious stumps of ossicles and remaining shreds of tympanic membrane removed, and entire lateral wall of attic was removed and antrum entered into.

The introduction of electric burr and its use by Lowe to drill the attic, and the development of the technique of local anaesthesia in operations on the middle ear through the canal in 1900 by Gompey and Von Eicken mark the second milestone in the evolution. These two advances have had the effect of reducing the time factor and increasing safety in mastoid surgery.

The procedure has been refined further and the names of Hartmann, Neumann, Politzer, Heath and others adorn the pages of the history of this period.

Then in 1907, Fritz Theis, the Senior, as mentioned earlier, performed the first radical mastoid through this route. He has published his results on 1500 patients operated through this route and except for one case of facial palsy he had no other complication.

Then we find the names of Hoffmann, Schmidt, Junior Theis, Mygind, Tobey and others in the literature respecting the later improvements in this surgery.

By this time the technique spread all over the world and has lured many workers into the list of its advocates. The advantages of this approach over the post-aural technique were realised. The field of infection is subperiosteally approached, there is less tissue damage, the time of operation is shortened, the epitympanic, ossicular and semicircular canal areas were in direct, rather than oblique line of vision and greatest of all, the post operative period of management, dressings and complications reduced. But the technique still differed in details with different workers.

But in these early operations the approach was through an opening made indiscriminately through skin and cartilage thereby leading post-operatively to a constricted field with atresia, stenosis and adhesions in the external auditory canal. The credit of avoiding this later complication by approaching through a triangular incision carefully avoiding muscles and cartilage goes to Lempert. He writes that having been dissatisfied with the results of temporal bone surgery both in his hands as well as in others hands, especially in the removal of exostosis of the external auditory canal he has "decided to look for and find a way of surgically removing an exostosis lesion from the external auditory canal without opening and destroying the mastoid process" as was traditionally done up to that time. He continues,

“that decision marked the beginning of my endaural surgery.” In fact that decision marked the revival of endaural surgery to the present day technique.

After removing the exostosis in the external auditory canal by the endaural route through an incision along the anterior margin of the concha and subperiosteally elevating the skin and periosteum he found the results were excellent both for the otologist and for the patient. The operation could be done under local anaesthesia and hospitalisation was only for two days. Gratified by the result, he extended the operation to repair endaurally the post-auricular fistula, a complication which confronts us occasionally even today calling for surgical correction. His results were far better than those by the various methods in vogue of surgically closing such a post-auricular fistula by the borrowing and diverting of skin, periosteum and muscle from the neighbourhood.

Encouraged by these results he performed the radical mastoid operation or the tympano-mastoidectomy as it is now designated. The approach was easier, the thin posterior bony canal wall was easily broken through as opposed to the thick post auricular mastoid cortex, the tympanic cavity could be easily dealt with being in the line of vision and there was no post auricular fistula in the end. Various incisions were tried and discarded and he now operates with his classical four incisions.

Subsequently he used the approach for repair of facial nerve injury and for the endaural mastoido-atticotomy. The operation is perfected by simplifying it and by so designing the incisions as to lie outside the cartilaginous canal wall the subsequent perichondritis is avoided and performing the operation endaurally “the occurrence of post auricular fistula has become a thing of the past”.

The development of the fenestration operation in the treatment of clinical otosclerosis has enormously increased the value of this endaural approach. Though the principle of fenestration

was first thought of by Holmgren, and performed successfully by Sourdille, the operation was made practicable only by the perfection of this approach by Dr. Lempert. The easy approach to the surgical dome of the vestibule, the site of the new fenestra without the arduous drilling through a thick and often sclerosed mastoid cortex, the easy practicability of the creation of a viable tympano-meatal flap for covering the new fenestra and sealing the tympanic air space to mobilise the endolymph, have greatly helped to bring this technique of fenestration in the otosclerosis to the present status. For this operation the approach is through a triangular window on the posterior wall of external auditory canal and the incisions are so placed as to be completely extra-cartilaginous. Great exactitude is necessary in making the incisions. Wishart has suggested that atleast ten minutes should be spent in making the incisions alone and that they should be made with the “greatest accuracy and precision”. Because if they are not properly made they may jeopardise the whole of the subsequent operation. When the incisions are so made a membranous window is created which is freely mobile along with the auricle over the temporal bone cortex. Moreover the opening should be made of the proper size if necessary by extending the incisions upwards along the margin of the helix.

Lempert has also described an endaural decompression operation in the treatment of Meniere's disease. For this the approach is through three incisions somewhat different from those for fenestration operation. The decompression is effected by the removal of stapes and the round window membrane.

In still recent times this approach has been utilised also for other operations on the temporal bone as for stripping the tympanic plexus in the treatment of tinnitus and for mobilisation of stapes in the treatment of otosclerosis (Rosen).

To complete the story of this evolution, mention must be made of the recent developments in certain fields other than endaural surgery, but which are nevertheless aids to it and have contributed in no small measure to its present status.

(a) **Control of Infection.**—The advent of chemotherapy and biotherapy has revolutionised the results of surgery in general and temporal bone surgery in particular. Till recently surgery on the non-infected temporal bone was attempted very nervously. And even in the case of surgery on the infected temporal bone the picture has changed. Unlike previously when operation was fraught with the danger of spreading infection and inactivity followed by spontaneous complications, we have come to a stage of control in therapy and results.

(b) **Magnification.**—The introduction of magnification into the technique of temporal bone surgery goes to the credit of Holmgren. It has emboldened the surgeons to approach with confidence the labyrinthine recesses whose intricacies were a real labyrinth up till now.

(c) **Illumination and Haemostasis.**—By the use of the frontal head light for illumination, the avoidance of anaesthetics which produce congestion and control of local bleeding by the use of improved haemostatic drugs and diathermy, surgical procedures of the temporal bone have been brought to within the reach of every otologist. This along with the use of magnification has facilitated a clear visual control for the operative measures in the deeply lying areas.

(d) **Suction and Irrigation.**—The use of gentle irrigation and continuous suction during the operation on the temporal bone has gone a long way in giving a clear field of unobstructed vision. Various types of apparatuses were evolved to provide a continuous irrigation but the age old chip syringe has still its advocates.

Thus we find that this endaural route is being now increasingly adopted for all the operative measures on the temporal bone in the treatment of infective as well as non-infective conditions. The practical utility of the approach for getting access to the middle ear and mastoid is now very well realised. When one

at the narrow external auditory canal one is surprised to how good an exposure could be obtained through this. And when the incisions are correctly placed a wide exposure is obtainable which facilitates the operative work: and judicious use of magnification and suction a clear control of measures at the depth is possible.

What future holds for this surgery one cannot tell. The chapter of evolution of antibiotics is not yet over. The chapter of enervation in otosclerosis is still in its infancy. The surgery of the temporal bone first started for the cure of deafness, has moved in the middle towards the treatment of infective conditions, and now has again swung back to the treatment aimed at giving relief in deafness. And to this end endaural approach is eminently suited as it avoids the unnecessary mastoidectomy through the thick cortex, the field of operation is in the line of direct vision, tissue damage is very slight, duration of operation shortened and post-operative management is uneventful.

I express my grateful thanks to my chief Dr. P. Narasimhaiah, M.S., F.I.C.S., for the encouragement and help so kindly given to me in the preparation of this article.

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CASE REPORT**Malignant Lymphoma (Mixed Type)**

BY

Dr. M. L. BHATTIA, M.B.B.S., D.L.O.,

K. G. Medical College, Lucknow.

Patient Ram Milan, young male, about 30 years of age, a Hindu farmer from one of the villages of Lucknow Dist. U. P., was admitted to the G. M. & Asstd. Hospitals E. N. T., wards Lucknow on 1-6-'56.

He complained of:—

- (a) a swelling on the left side of the head, cheek and neck—Duration ... 5 months.
- (b) frequent attacks of severe pain on the swelling with intervals of 4-5 days ... 5 months.
- (c) difficulty in opening the mouth ... $2\frac{1}{2}$ months.
- (d) restricted movement of head to the left side ... $2\frac{1}{2}$ months.

Past History.—He did not give any history of trauma or any past illness relating to the complaints. No history of tooth extraction or any sinus lavage.

Family and Personal History.—Of no significance.

History of present illness.—The patient said that 5 months back he noticed a small swelling of the size of a finger tip on the left cheek. From the very beginning it was hard and painful. He applied fomentations but there was no relief. The swelling went on increasing in size and within about 2 months it spread downwards on the left cheek and upwards over the left temple. Within another period of $2\frac{1}{2}$ months the swelling became more painful and increased in size covering the areas of left

temple, left cheek and left side of the neck as noticed at the time of admission. He described the pain to be coming in attacks which remained for 4-5 days, then disappearing by itself to come up again after the same period. It was not accompanied by fever or any other illness worth mentioning.

About 2 months before the date of admission the patient had started experiencing difficulty in opening the mouth and also had inability to turn his head to the left side. He also felt giddy every time before the onset of acute attack of pain on the swelling. Only 20 days before admission to the hospital he noticed another small swelling just behind and below the lobule of the right ear. About a fortnight after admission he started complaining of pain in the right thigh.

General Survey.—A young adult, of a healthy musculature, pulse 80 p.m., V. T. moderate and regular, respiration 20 p.m. regular, Temp. 99.0 F.

Systemic Examination.—Clinically no abnormality could be detected anywhere except the glandular enlargement in the following regions:—left submental, left upper sterno-mastoid left post. triangle, left axillary, right infra-auricular, and right sterno-mastoid. The glands were hard, shotty and slightly tender.

Special Examination.—(1) A hard swelling $2" \times 2"$ on the left side of the frontal region, stony hard in consistency, not mobile, temp. over the swelling not raised. (2) A big irregular hard swelling which extended from the left parietal region to the root of the neck. Anteriorly it extended above to the left half of the forehead, in the middle it extended from the pinna of the left ear to the zygomatic bone, and below from the left half of the occiput to the anterior border of the sternomastoid. All were stony hard in consistence, fixed, with no change on the over-lying skin. Pitting oedema over the left post. auricular region was present.

Nose - N.A.D., *Ear*-right N.A.D., left-tympanic memb. could not be seen due to the stenosis of the ext. aud. canal.

Blood Examination.—Total W. B. C. count 16800/c.mm. Diff. W.B.C. count Polys. 85, L. 13, E. 2. Haemoglobin : 70% Sedimentation rate : observed reading 6 mm. for 1st. hr. Blood Urea : 21 mgms.% Wasserman reaction : Negative. V.D.R.L. : Negative. Serum analysis. Calcium : 10.1 mgm.% Phosphates : 2.0 mgm.% Cholesterol : 200 mgm.% (Blood cholesterol level). Tuberculin test : Negative. Urine : No abnormality. Bence Jones Protein : absent.

Skiagrams.—(figs. 3, 4 and 5) The skull bones showed demineralization (a) Osteomyelitis (b) Secondaries. Metastatic deposits were not present in the femur.

Biopsy.—(a) Section of the lymph gland: The whole of the gland was sectioned. It showed fibro-fatty tissue enclosing a large caseous area which was surrounded by mono-nuclear cells which had a foamy cytoplasm. Foreign body giant cells were not seen. The adjoining fatty tissue showed infiltration by chr. inflammatory cells. No tumour cells were seen.

Section of Tumour.—(b) Section of the tissue from the tumour—(Parotid region) (figs. 6 and 7), The section showed diffusely scattered masses of rounded or ovoid cells having prominent deeply stained nuclei and scanty cytoplasm. Intermingled in these cells were a number of lymphocytes. Normal pattern of the lymph gland was not discernible. Diagnosis : *Malignant Lymphoma* (Mixed type).

Characters of Malignant Lymphoma.—Definition : (Wolff-1946) "Implantation of lymphoid follicles in places where they are not supposed to exist normally is regarded as a lymphoma. The neoplasms may consist chiefly of lymphoid structures but in some instances may contain germ centres. These benign developments of localised lymphoid tissue may undergo malignant changes".

(Gall and Mallory—1942) "The term Malignant Lymphoma is used to designate a tumour involving one or more cell types of the reticulo-endothelial system which if untreated will lead to the death of the patient".

Malignant Lymphoma - Mixed Type



Fig. 3

Fig. 4

Patient - Ram Milan (Lucknow) Malig. Lymphoma



Fig. 3

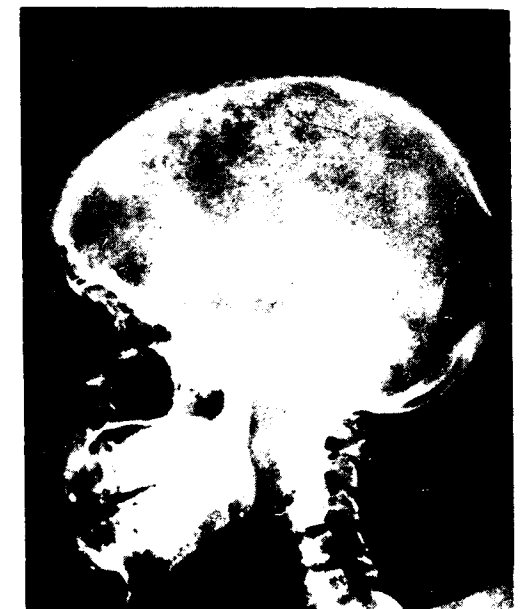


Fig. 4



Fig. 5

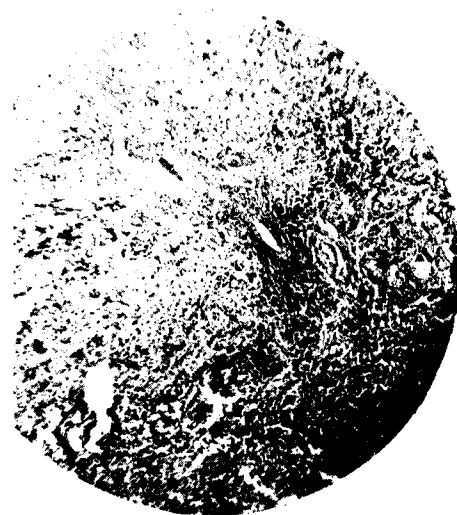


Fig. 6

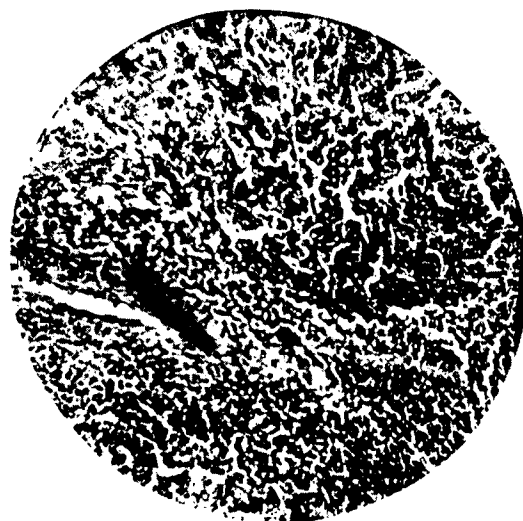


Fig. 7

The synonyms used are : Reticulosis (Pollinger 1932, Ross 1933) and Reticulo-sarcoma (Robb Smith 1938).

Types.—The following 4 types of Malignant Lymphoma have been described : (1) Follicular Lymphoma. (2) Lymphosarcoma. (3) Reticulo-cell Sarcoma. (4) Hodgkin's Disease (Willis - 1953).

The first two arise when there is a proliferation of Lymphocytes, the third is characterised by the production of reticulum fibrils in the stroma and the 4th is distinguished by Hodgkin's giant cells.

Clinical Features.—Age: 30 Years. Sex: Male. Site of occurrence: Parotid region. Rate of growth: Fairly rapid, (duration 5 months.) Pain: A conspicuous feature. Palpable lymph nodes: All the neighbouring groups of lymph nodes were enlarged, hard, shotty and tender. A few glands on the other side of the neck were also palpable. Consistence of the tumour: Firm, tense and hard. Ulceration: Did not show any tendency to ulcerate. Cranial nerve involvement: No palsy was noted. Giddiness: present. Bony involvement: The skull bones showed demineralization—Osteomyelitis and secondaries. Biopsy: Gland biopsy—Negative. Diagnosis: From tumour region (Parotid). Malignant Lymphoma (Mixed type) Treatment: Radiotherapy. Five deep rays exposures were given. Response to treatment: Not encouraging.

Discussion.—This type of case (Malignant Lymphoma Mixed Type of Parotid region) being reported by me has never been reported before.

The rarity of this disease can be appreciated by the fact that only 16 histologically proven cases of Malignant Lymphoma have been reported in the regions of Nose and Throat in 20 years *i.e.* from (1934-54) by Harmann, Kodiek, Pollinger (1956), but only one was of mixed type and none arising from the Parotid region and again none at such a young age as this case of 30 years.

1. Age.—In a clinico-pathological survey of 618 cases studied by Goll and Mallory (1942) the average incidence was found to be 42.5 years. Gwen and Hilton 1948, reported the age incidence as 50–80 years while it has recently been reported as ranging from 37–75 years in a study of 578 cases of Malignant Lymphoma (Harmann, Kodiek and Pollinger-1956). The age of our patient was 30 years, much below the average noted by others.

2. Incidence of occurrence. It is of a rare occurrence particularly in relation to Nose and Throat regions as is apparent from the report of (H. K. P. 1956) in which they could find only 16 histologically proven cases of Malig. Lymphoma in 20 years 1934–54). Out of these 16 cases they have mentioned only one to be that of mixed type.

We have seen and examined five cases of Malignant Lymphoma who attended G. M. and Asstd. Hospitals, Lucknow during the period of 5 years (1950–1956) in the following regions including the one being reported:

Tonsils - 3 Nasopharynx - 1 Parotid - 1

3. Sex.—Our case being a male is in conformity with the greater frequency of occurrence among males as observed and reported by others.

4. Site of occurrence.—H. K. P. (1956) for the first time tried to group the cases of Malig. Lymphomas in relation to Nose and Throat and they reported Tonsils-9, Maxilla-1, Nasopharynx-2, Ethmoid-4, but our case presents an entirely new site of origin-Parotid region, which has not so far been reported by any one else.

5. Rate of Growth.—Five months history for causing such a wide spread swelling is quite a short period and it quite agrees with the observation of H. K. P. (1956), where they have remarked that the rate of growth of these tumours appeared to be more rapid than that of Carcinoma in that region.

6. Pain.—It is a conspicuous factor in our case, although H. K. P. (1956) have remarked “Pain was conspicuous by its infrequency in our series, even rapidly growing Lymphomas invading bone did not seem to cause more than occasional discomfort.”

7. Palpable Lymph Nodes.—All the neighbouring groups of lymph nodes were enlarged, hard, shotty and tender. According to H. K. P. (1956) this should be as a result of metastasis from the seat of primary proliferation but in our case it was probably due to secondary infection and not due to metastasis because there was no indication of any wide dissemination of the disease in them, as is evidenced by the negative report in the gland biopsy. Had this been so, the outlook in our case would have been more grave but it was not so. The enlargement of the lymph nodes on the right side may possibly be due to metastasis but biopsy was not done.

The W. B. C. count in the series of cases by (H. K. P.) were usually normal while in our case there was a slight degree of Polymorph. leucocytosis.

8. Consistence of tumour. In our case it was found tense and hard but as reported by H. K. P.-1956, it is generally firm rubbery to a jelly like and rather amorphous mass.

9. Ulceration.—It was noted in 1/3 of cases by H. K. P. which they say tends to be a late sign and may be entirely absent even with large tumours. In our case it did not show any tendency to ulcerate upto the time when the patient was discharged from the hospital on 21—7—'56.

10. Bony Involvement.—In our case the tumour showed a clear disposition to involve the underlying bones Figs. 3, 4.

11. Giddiness.—This was a prominent factor particularly preceding and accompanying every attack of pain.

12. Biopsy.—From the tumour region it was positive for Malignant Lymphoma (Mixed type).

1. Age.—In a clinico-pathological survey of 618 cases studied by Goll and Mallory (1942) the average incidence was found to be 42·5 years. Gwen and Hilton 1948, reported the age incidence as 50–80 years while it has recently been reported as ranging from 37–75 years in a study of 578 cases of Malignant Lymphoma (Harmann, Kodiek and Pollinger-1956). The age of our patient was 30 years, much below the average noted by others.

2. Incidence of occurrence.—It is of a rare occurrence particularly in relation to Nose and Throat regions as is apparent from the report of (H. K. P. -1956) in which they could find only 16 histologically proven cases of Malig. Lymphoma in 20 years 1934-54). Out of these 16 cases they have mentioned only one to be that of mixed type.

We have seen and examined five cases of Malignant Lymphoma who attended G. M. and Asstd. Hospitals, Lucknow during the period of 5 years (1950-1956) in the following regions including the one being reported:

Tonsils - 3 Nasopharynx - 1 Parotid - 1

3. Sex.—Our case being a male is in conformity with the greater frequency of occurrence among males as observed and reported by others.

4. Site of occurrence.—H. K. P. (1956) for the first time tried to group the cases of Malig. Lymphomas in relation to Nose and Throat and they reported Tonsils-9, Maxilla-1, Nasopharynx-2, Ethmoid-4, but our case presents an entirely new site of origin-Parotid region, which has not so far been reported by any one else.

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10. Bony Involvement.—In our case the tumour showed a clear disposition to involve the underlying bones Figs. 3, 4.

11. Giddiness.—This was a prominent factor particularly preceding and accompanying every attack of pain.

12. Biopsy.—From the tumour region it was positive for Malignant Lymphoma (Mixed type).

13. Effects of Radio-therapy.—The response after 5 exposures of Deep rays was not encouraging therefore the patient was discharged as an incurable case.

Summary.—The case of Malignant Lymphoma (Mixed type) of Parotid region is being reported here with some special features *e.g.*, early age, new site of origin (Parotid), pain very conspicuous, involving the underlying bones and no metastasis in the palpable regional lymph nodes as shown by the negative result of the gland biopsy and positive from the primary origin (Parotid region).

I am indebted to Dr. R. N. Misra, Professor and Head of the Dept. of Otolaryngology, who has so kindly permitted me to publish this case.

Thanks are due to Col. R. K. Tandon Supdt. G. M. and Asstd. Hospitals for providing facilities to undertake all the investigations and also to Dr. K. P. Wahal Dept. Pathology for supplying the path, records and also for lending the section slides to me for micro-photography.

I also thank Dr. R. K. Singh and Dr. P. Chatterjee for supplying the case sheets and the photo-prints respectively.

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Obstructive Dyspnoea in Children

BY

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This is a brief review of 34 cases of obstructive dyspnoea in children which I met with in the Sassoon Hospitals or at my clinic.

When one is called up to see a case where a child is seen struggling for breath one gets confused for a moment what may be the cause of breathlessness and how to deal with it. Many young lives have been lost because proper investigations and correct treatment is not instituted at the right moment.

Any medical personale may be called upon in an emergency to relieve impending dyspnoea due to obstruction and he should have a clear conception as to how to tackle it. This is the sole purpose of writing this paper.

Direct laryngoscopy and advent of antibiotics have revolutionised the diagnosis and treatment of laryngeal diseases, in children. Prior to these, laryngeal diseases remained in a deplorable realm of guess work.

With reasonable care and accuracy in diagnosis it is possible these days to deal with laryngeal dyspnoea effectively.

At the onset I may say that children's larynx has peculiar shortcomings. It is small in dimensions, very pliable, and it is surrounded by lot of lymphoid tissue. Hence it is very vulnerable to get obstructed because of infection, new growth, malformations or foreign body. Another important factor is that children are very vulnerable to asphyxia. Respiratory centre is unable to

withstand anoxoemia for a long time. Taking these things into consideration one would realise how important it is that the obstructive dyspnoea is promptly treated.

In the majority of cases obstructive dyspnoea is of laryngeal origin, and cardinal signs and symptoms are as follows:

- (1) There is difficulty in inspiration.
- (2) It is accompanied by stridor.
- (3) Retraction of the suprasternal space and intercostal spaces.
- (4) Congestion of the neck veins.

Accompanied with it there is air hunger, rapid breathing, fast pulse and extra muscles of respiration acting. But these signs and symptoms are common to all dyspnoeas of any origin.

I have divided these 34 cases into two big groups. (1) Dyspnoea of acute onset (2) Dyspnoea of chronic onset.

Let us deal with the dyspnoea of acute onset.

- (1) Laryngeal diphtheria - 7 cases.
- (2) Acute laryngo-Tracheo-Bronchitis - 4 cases.
- (3) Acute laryngitis - 1 case.
- (4) Laryngismus stridulus - 2 cases.
- (5) Foreign bodies in the air and food passages - 5 cases.

Laryngeal Diphtheria. It is usually a disease of infants accompanied by faucial diphtheria. But occasionally it occurs alone and then it is difficult to diagnose unless direct laryngoscopy is done. Laryngitis with change in voice, cough, fever, cold and progressive obstructive dyspnoea and asphyxiating paroxysms is due to diphtheria in 90% of the cases. It is undesirable and difficult for a family physician to do direct laryngoscopy when a child is acutely ill. It is always desirable to get it done by a

Laryngologist who is an expert in doing it with least trauma. Otherwise if expert help is not available I would like the family physician to diagnose it with circumstantial evidence. It is better to diagnose many cases wrongly as diphtheritic rather than miss even a single genuine case of diphtheria and leave it untreated. When a whitish patch is seen in the larynx the diagnosis is established. Otherwise in every case with congested and oedematous larynx it is always preferable to take routine swab for examination. Since life is at stake every case must be treated energetically.

If the practitioner has reasonable grounds to believe that the infection is diphtheritic he should treat it promptly. Delay for bacteriological report is inexcusable.

Time does not permit me to deal with the treatment in detail, hence in short:

- (1) Complete bodily and mental rest.
- (2) Sufficient anti-toxic serum.
- (3) Penicillin parenterally as bacteriostatic.
- (4) Plenty of fluids including glucose.
- (5) Vitamin C and B in large doses.
- (6) Emergency tracheotomy.

About Tracheotomy.—It is very difficult to say by cut and dry rule the exact stage when you advise tracheotomy. It is unwise to wait for cyanosis to come on. Cyanosis is a sign not much of laryngeal obstruction but of impending death. You may come across cases where you feel that the dyspnoea is very acute and ask the mother how long it is and one is astonished to hear that it is for 5 to 6 days. I feel it is a vigilant watch, hour by hour of a case with pulse and respiration count that will give you a sure clue as to the progress of obstruction. Air hunger and exhaustion is a sure clue that tracheotomy is urgently needed. Rise in pulse suggests that heart has to compensate for respiratory embarrassment. I feel the mother is the best person to tell

you about the rapidity of respiratory embarrassment. Good judgment is still of major importance and gives one a feel of the case. This feel has been developed to higher degree in some of the nursing supervisors who have been in long and intimate contact with great number of croup children. As a rule it may be said that do a tracheotomy as early as possible. Lot of excitement and struggle on the part of the child will disappear if preliminary to tracheotomy one introduces a small bronchoscope or tracheotomy tube into the trachea.

Age	Sex	Type	Day when Admission	Tracheotomy	Complication	Results
2	Female	Secondary to pharyngeal ...	2nd day	Done	Nil	Cured
1½ M.	Male	Secondary ...	4th day	..	..	Died
10 M.	F	Laryngeal ...	3rd day	..	..	Cured
1 year	M	..	1st day	..	..	Cured
4 year	F	Secondary ...	12th day	..	..	Died
1 year	F	Laryngeal ...	3rd day	..	Paralysis of the larynx, aspiration pneumonia	Cured
1 year	F	Secondary ...	4th day	..	Swelling in the neck	Cured

Laryngo-Tracheo-Bronchitis.---It is a clinical entity which is more and more diagnosed in recent days. It was formerly named as influenzal type of Broncho-Pneumonia. Initial symptoms are those of cold in head followed by hoarseness, croupy cough a stridulous breathing and air hunger. Chief pathological picture as shown in the endo-bronchial picture is the obstruction of large bronchial trees. There is controversy about the causative organism. It is supposed to be caused by virus infection. This condition can account for many of the deaths where swab is negative for diphtheria and still child rapidly becomes toxic and dies. Unfortunately we do not get sufficient Post Mortem to establish diagnosis. Peculiarity of this disease is that onset and progress of the case is very dramatic and child becomes seriously ill within a few hours with combination of symptoms of:

- (1) Subglottic oedema.
- (2) Laryngeal obstruction with affection of bronchi and lung tissue (*i.e.* Broncho-Pneumonia).

Most of the patients are buried under the diagnosis of diphtheria or croup and others label the all-covering diagnosis of pneumonia.

Direct laryngoscopy reveals marked congestion of the larynx with sub-glottic oedema. Bronchi are red and show intense drying with crust formation. In planning treatment one must recognise that one is dealing with a systemic disease of which laryngeal disease is only a part.

Three cardinal principles must be observed:

- (1) Early diagnosis and full institution of Polytherapy by combination of Aureomycin, Streptomycin, and Penicillin.
- (2) Combat the dehydration by fluids.
- (3) Supply plenty of oxygen which is cool and sometimes supplemented by a steam tent.
- (4) Tracheotomy in markedly dyspnoeic cases.

Four cases of Laryngo-Tracheo-Bronchitis:

Age	Sex	Day of illness	Laryngoscopic picture	T P R	Tracheotomy	Therapy	Result
1	Female	24 hrs.	No patch, combined symptoms laryngeal and bronchial	100.6 Temp. 140 Pulse 80 Resp.	Nil	Poly-therapy by antibiotics	Cured
1½	Male	8 days	Patch seen negative for diphtheria combined symptoms	98 Temp. ? Pulse 54 Resp.	Done	do	Cured
11 months	Female	1 day	No patch combined symptoms	104 Temp. 126 Pulse 60 Resp.	Done	do	Cured
2 yrs.	Female	12 hrs.	No patch Swab negative for diphtheria marked oedema of the lungs	No detailed data available	Bronchial aspiration done	do	Died

Sex	Age	Symptoms	Direct Laryngoscopy	X-Ray	Investigation	Treatment
F	3	Congenital. Stridor intermittent fever	N. A. D.	Mottling rt. base and left supraclavicular zone? Koch's	E. S. R. 32 mm	Anti-tubercular
F	2	do	do	Opacity rt. hy-lum mediastinal glands	Lymphocytes 70% and polymorphs 30%	do
			Bronchoscopy showed pressure on the trachea	++ mottling at the apex a sinus in the sub-maxillary region		Cyst was removed by direct laryngoscopy child began to speak and dysp. disappeared
M	2	do and unable to talk	Cyst in the ventricle left side	Collapse posterior lobule rt. side		Advised
M	4 M	Symptoms after 2 months	Elongated epiglottis	—		
M	1½ Yr.	After 1½ year	N. A. D.	—	Not investigated further	

Hooded epiglottis is seen in some cases to be the cause of laryngeal stridor. It can be diagnosed by direct laryngoscopy. If dyspnoea. disappeared after lifting the epiglottis it is a proof that flapping epiglottis is the cause. This requires no further treatment but an assurance to the parents that as the child grows up the larynx will become more rigid and the stridor will disappear.

Three cases of laryngeal stridor to my surprise showed normal larynx. X-ray picture was taken in two cases which showed presence of mediastinal lymph glands which were pressing on the trachea or bronchii giving rise to stridor. In one case child had a suppurating sinus in the sub-maxillary region. I tried to investigate the nature of organisms but no positive proof would come up to say that the glands are tubercular in origin. Both of these cases are under anti-tubercular regime. They are feeling better but it is too early to say precisely anything in the matter. I wish to do tuberculin test in those children.

Bilateral Abductor Paralysis. This lesion comes suddenly after an illness either due to diphtheria, typhoid or exanthematous fever, usually after 5 to 6 weeks. If there is complete paralysis child gets choked up and immediate tracheotomy is needed. In partial paralysis child is able to breathe but with a stridor and gets easily breathless on running climbing or playing. Luckily with proper rest to the larynx these cases improve; those which are resistant have to wear permanent tracheotomy tube or to undergo surgical procedures such as King's operation of Arytenoidectomy.

Sex	Age	Symptoms	Direct Laryngoscopy	Treatment	Result
Female	5	Laryngeal stridor history of fever one month back	Paralysis rt. vocal cord	Tracheotomy Berin 100 m. grams per day for month	Improved
Male	11	Laryngeal stridor	Bilateral Ab. paralysis paralysis of the soft palate paralysis of the left extremity difficulty in swallowing	Complete rest nasal catheter for feeding and Vitamin B	Improved after 60 days
Male	6	History of typhoid	Bilateral Abd. Paralysis	Tracheotomy and Berin	Improved
Male	4	Laryngeal stridor for 2 years	do	do	Permanent tracheotomy Refuses operation

Growths in the larynx:

Sex	Age	Symptom	Direct Laryngoscopy	Treatment
Male	5	Acute laryngeal obstruction	Emergency tracheotomy done Direct laryngoscopy afterwards revealed to our surprise multiple papillomas	—
Male	6	Chronic laryngeal stridor	Direct laryngoscopy, multiple papillomas seen	Tracheotomy done. Papillomas removed. Patient put on Aureomycin therapy. Papillomas recurred. Child died of inter-current infection
Female	11	Fever, Cough, stridor	A tuberculoma sprouting from the larynx coming upto the base of the tongue showed all other signs and symptoms of tubercular infection	Before any treatment could be instituted, died

Retro-Pharyngeal Abscess.—This condition in its acute form is met with in children between 3 months to 3 years after an acute respiratory infection giving rise to suppuration of the retro-pharyngeal gland between the prevertebral fascia and pharyngeal wall. These cases are easy to diagnose if one takes care to look at the posterior wall of the pharynx. I came across 3 cases out of which 2 were diagnosed as diphtheritic laryngitis and the correct diagnosis was made after about a month. Treatment consists in incision with due care to keep suction apparatus by your side and incising abscess without general anaesthesia. I have seen that aspirations are required repeatedly.

Age	Sex	Symptoms	X-Ray Finding	Treatment	Organisms responsible	Result
2	Male	Swelling in the neck, noisy breathing, 10 days' duration, fever	Posterior pharyngeal wall lifted up. No lesion of the vertebrae	Incised aspirated 4 times	Diplococci on culture B Pyocyaneus	Cured
1½	Female	Treated as diphtheria for 8 days Sent for examination 1. regurgitation of fluids 2. difficulty in breathing	—	Tried to do direct laryngoscopy abscess burst open	—	Cured
3	Female	Diagnosed as diphtheria treated for a month. Came with laryngeal stridor and swelling in the neck	Lifting of the posterior pharyngeal wall	Incised repeated aspirations took 21 days to disappear stridor	—	Cured

In conclusion I would like to stress the obstructive dyspnoea in children if diagnosed early and correctly can be treated with good results.

I have to thank Civil Surgeon, Sassoon Hospitals, Poona for allowing me to make use of the case records of Sassoon Hospitals.

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CASE REPORT

Foreign Body Larynx

BY

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It is relatively uncommon, according to Nielson, to see a foreign body impacted in the larynx and causing much obstruction to air entry, it usually being large enough to become fixed in the pharynx or small enough to pass into the trachea. In this case a large foreign body was impacted in the larynx for over five days without much obstruction which prompted me to report this case. Such cases being rare it is worthwhile refreshing our knowledge about the laryngeal foreign bodies (hereafter referred to as F.B.)

Mechanism.—A F. B. can enter only when the normal cough reflex is interfered with *e.g.*, during sudden indrawing of breath in fright or laughter or when the back is slapped suddenly and unexpectedly causing inhalation into the larynx or tracheobronchial tree of food particles or other articles held in the mouth. F. B. may be held up at the epiglottis or at the glottis by the ventricular and vocal folds or again it may not be able to enter the tracheobronchial tree by the immediate reflex cough, though in some cases a sudden inspiration, which precedes the reflex cough, draws the F. B. into the bronchus.

Symptoms.—Varying degrees of dyspnoea according to the size of the F. B. occur, depending also upon the amount of spasm and the attendant edema. Stridor may also be present. The patient may be hoarse or even aphonia may result. Cough with blood stained expectoration and local pain referred to the ear may occur. Patient points to the front of the larynx as the seat of pain. There may be retrosternal pain. Surgical emphysema may result from laceration of mucosa.

Course.—Acute laryngeal obstruction is usually transient and very rarely does death result from asphyxia according to Love and Bailey. From time to time paroxysms of dyspnoea, with

a terrifying sensation of impending death occur. Or later the F. B. may undergo disimpaction and be coughed up or symptoms of local inflammation supervene if the F. B. has penetrated the mucosa.

Diagnosis.—An adult will usually give the history while a child may conceal it. Indirect laryngoscopy helps. The immediate symptoms following the accident can only give a clue to its position. It is important to find out whether or not there was cough or dyspnoea at the time of accident, followed by blood stained expectoration. Absence of cough strongly negatives the possibility of its having passed into the air passages and supports the probability of its having passed into the gullet. Even the smallest F. B. remaining in the esophagus causes pain on swallowing and very often a reflex cough. Lateral soft tissue skiagrams may be of great help.

Prognosis.—A laryngeal F. B. may choke the patient to death if it gets impacted suddenly. On the other hand it may give no further symptoms after the initial violent spasms of coughing.

Treatment.—Remove it immediately. A large F. B. may be dislodged by the fingers while the child is held upside down. If dyspnoea is severe and F. B. cannot be dislodged immediate laryngotomy or tracheotomy is essential. If dyspnoea is not urgent F. B. should be removed with forceps by direct laryngoscopy. A tracheotomy may need to be performed if edema or surgical emphysema is present or if an increase in edema is feared.

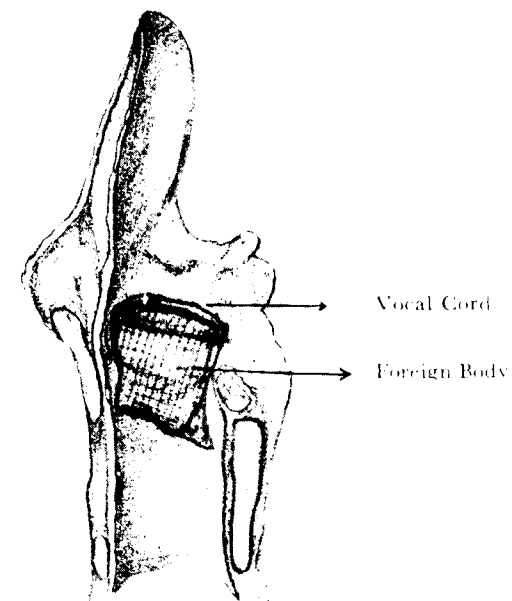
Case Report.—Miss C. aet. 9 years, brought on 10-2-56 from a distant village with the history of having swallowed a pebble 5 days back. She complained of pain on swallowing and inability to eat since then. She did not complain of cough or any dyspnoea. She looked toxic and was hoarse in voice. While playing with pebbles she put one of them in her mouth and swallowed it accidentally. She felt choked and gripping her soundbox ran to her father for help. Gradually her condition settled except for symptoms noted above. Breathing became more noisy during sleep.

Foreign Body Larynx

Side view of the Foreign Body Larynx



X-Ray Larynx showing F. B. marked by arrows Positive Print



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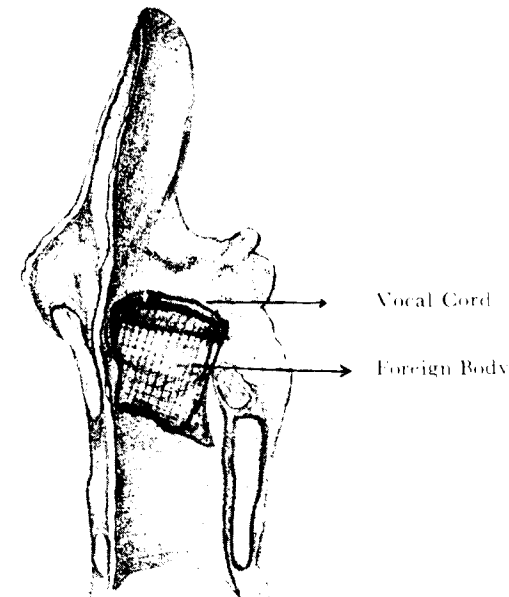
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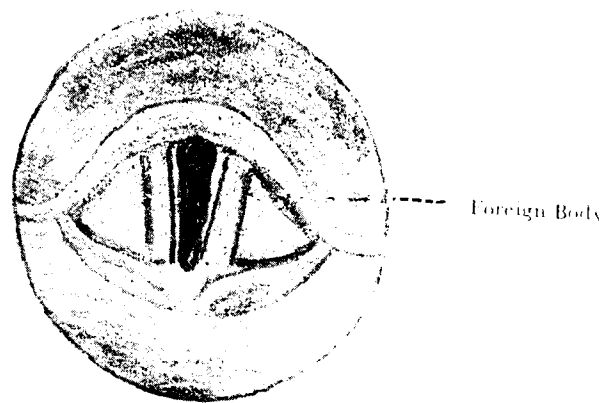
Foreign Body Larynx

Side view of the Foreign Body Larynx

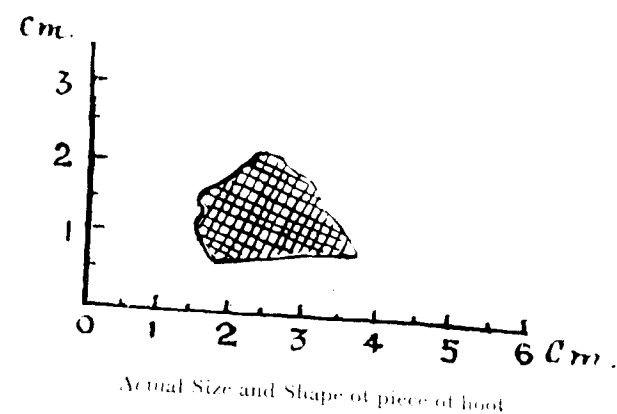


X-Ray Larynx showing F. B. marked by arrows Positive Print





Larynx of Miss C:—showing a piece of hoof impacted between the vocal cords



Straightaway screening chest was done. It did not reveal any opaque F. B. Toxic condition of the child and hoarse voice led me to examine her larynx. I found a greyish object being tightly gripped by the cords. It was difficult to judge whether there was any F. B. because of its greyish coloured linear edge till the cords relaxed during inspiration and moved away from the F. B. leaving it as a longitudinal partition in the glottis. This led me to take a skiagram of the larynx which gave a doubtful shadow, later confirmed to be due to the F. B. Its nature however remained in doubt till after removal and histological study.

Examination of the child presented a child in agony, still gripping her larynx and with a hoarse cry. Wheezy breathing could be heard. There was no cyanosis nor any marked inspiratory recession of the suprasternal space and epigastrium. Temp. 99° F. Pulse 118/minute. Resp. 26/minute. Both lungs expanding normally. Percussion notes normal. Wheezing breath sounds heard over both lungs in all areas. Screening chest also showed no abnormality in the lungs.

Treatment.—On 10—2—56 under local anaesthesia tracheotomy done at 3rd tracheal ring. As the F. B. looked to be impacted in inflamed laryngeal mucosa it was considered better to remove it under general anaesthesia given through tracheal cannula. Atropine Sulph. 1/100 gr. given intravenously prior to administering ether. On direct laryngoscopy waited for the vocal cords to separate. Gripped the F. B. between the jaws of a crocodile forceps and pulled it out. No ulcerated or bleeding area left behind. F. B. was found to consist of irregular triangular shape with serrated margins and of friable consistence. Greyish Black colour and its elasticity led one to think of a piece of hoof or tree bark. Histology proved it to be a mass of keratin. After 24 hours the tube was removed. Wound healed and the patient discharged as cured on 15—2—56.

Comments.—F. B's. of the larynx are rare, especially those impacted in the glottis. They are either too big to enter the larynx and hence pass down the esophagus or are too small to get impacted in the larynx and pass down the trachea.

This F. B. was peculiar in having a triangular shape and getting impacted in the sagittal plane of the glottis. Usually such flat bodies when passing through the pharynx get rotated into the coronal plane and pass behind the larynx into the esophagus. So it is surprising to imagine how it passed into the larynx. However its shape and size practically conforming to the conus elasticus or subglottic region helped it to get impacted and not get drawn down the trachea during inspiration. It did not cause respiratory obstruction because the cords could afford to lose the 'grip' for a while off and on to allow the air entry. Cough was absent because tracheal mucosa was not being irritated. Though of organic origin it did not cause much local or general disturbance. Toxic condition was due to dehydration and inanition. The history of having swallowed a pebble and its absence on screening, absence of cough and dyspnoea were rather misleading. Hoarseness however led to its detection by indirect laryngoscopy. Tracheotomy was necessitated by G. A. which was essential to relax the apprehensive child to allow gentle removal of the impacted F. B. Dysphagia may be explained by the pressure exerted on the partition wall between the larynx and the esophagus because of its large size. During swallowing when the larynx rose the F. B. caused pain.

Summary.—(1) Mechanism of entry, signs and symptoms produced by F. B's. lodging in the larynx and their treatment is reviewed. (2) A case of impacted F. B. (hoof) larynx is described.

Acknowledgement.—My thanks are due to Dr. S. P. Wanchoo, F.R.C.S., Civil Surgeon, for allowing me to publish the case. I am grateful to Dr. B. C. Singhal, M.D., Pathologist, for confirming the nature of F. B. by histological technic.

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*Laryngectomy

BY

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FRIENDS,

I am going to tell you about my recent experience on Laryngectomy. I must be frank to you that I was prompted to start this Laryngeal operation after seeing several Laryngectomies being done in U. S. A., Canada, Continental countries and U. K. As all of you know, we have got a Radium Institute in which a large number of Laryngeal cancer cases come for treatment from my State and from neighbouring States. I was aghast to see the number of Laryngeal cancers at Dibrugarh and Cuttack. I don't know why there is preponderance of Laryngeal cancer cases in Assam and Orissa but they are thinking in terms of the vast population being in the habit of chewing betel nuts. Dr. Sharma, Prof. of E. N. T. at Dibrugarh is doing some research on this subject. In U. K. I watched Mr. Birdsall who is a pioneer in doing Laryngectomy. I have watched Mr. Wilson and Prof. Ormerod. Dr. Birdsall does it so efficiently that I decided that I should be starting to do it at my place. The first case that I took up was a patient hailing from Allahabad and subsequently I have done four more. The first case was done in the month of July 1955. I had a lot of practical difficulties in doing the first case. There was sudden failure of blood-transfusion mechanism due to non-entering of blood and blood pressure fell very low. I had to wait practically for half an hour till the transfusion was resumed. The operation was finished but I was very much apprehensive about the life of the patient. However he rallied round. I had put in an oesophageal tube and this the patient threw out after third or fourth day and was not in a mood to receive it back. Although at present

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Birdsall does not use a tube at all I decided to use it. The patient developed fistula subsequently and it became very difficult to feed him. Subsequently it was decided to do gastrostomy which was done by my colleague Dr. R. N. Sinha. This patient had a big bed sore even before Laryngectomy. This was another draw back in his cure. I kept him in the hospital and the patient's nourishment improved. His fistula subsequently healed after four months and the bed-sore also healed. The patient has developed a beautiful oesophageal voice. I think for all practical purposes he is quite alright. His gastrostomy wound has been closed.

Case No. 2.—Done on 26--7--55. He had uneventful recovery and was discharged from the hospital on 31--8--55. He did not develop fistula. I am sorry to note that he has come back with secondary gland involvement. I am dealing this case with radio therapy.

Case No. 3.—Also hailed from Allahabad. He was brought in moribund condition as an emergency case. He had respiratory distress and he was only skin and bone. Emergency tracheotomy was done and he revived. Subsequently when he gained strength it was decided to do laryngectomy. His Laryngectomy was done on 15--9--55 after two months stay in hospital. A portion of growth was sent for biopsy and it turned out to be epidermoid carcinoma. In this case there was involvement of a gland which was lying on the right side and it was matted to the carotid sheath. I tried to take that out but could not succeed and ultimately I decided to do the Laryngectomy and leave the gland as it is. This was against the teaching of modern laryngectomy. But I decided to do the gland dissection later on. Another point of my taking this decision was that he had radiation treatment before and hence Laryngectomy itself was a very difficult job. He had difficulty in raising the right upper limb and I think it to be due to pressure of the gland near about the bronchial plexus. He also developed fistula but later on after a great deal of trouble the fistula healed. This patient is still in hospital and I think the secondary

gland is causing the havoc. There has been metastasis in median-line because off and on he develops choking sensation and there is difficulty in deglutition. There has been another secondary gland in submental area.

Case No. 4.—Came in on 5--8--55 Muslim Male, aged 70, due to his age he was very much debilitated and the cancer was in an advanced stage. His laryngectomy was done but he had big secondaries situated on the left side. This again had to be given up due to the low condition of the patient. The patient had wonderful recovery but he also developed fistula. He was an old malarial case and once or twice he got relapses. The patient died in the hospital after about a month of his operation.

Case No. 5.—The fifth case was that of a Hindu Male aged 50 years. He also came in moribund condition and his tracheotomy was to be done as an emergency case. The growth was extensive, Laryngectomy was done on 23--8--55. This case subsequently had rise of temperature and he had acute respiratory distress. His fistula never healed and he was fed through an oesophageal tube. His chest was X-Rayed and it was found that he had pyo-pneumo thorax in the right side. A large amount of pus came out by change of posture because he had developed fistula through his bronchus. It was decided to close the bronchial fistula. I had consulted Prof. U. P. Sinha, Prof. of Surgery and he was kind enough to do closure of fistula for me but the patient died subsequently.

Historical.—Now I will tell you something about the evolution of Laryngectomy. About 150 years ago Desault performed the 1st thyrotomy operation. It was in 1873 that total Laryngectomy was done by Billroth. In the 1st 25 cases of Laryngectomy none survived. They died of Septicaemia or of pulmonary complication. Then they started performing operation in two stages. 1st tracheotomy and 2nd Laryngectomy. Lebec in 1905 did further modification in two stages. He sutured the tracheal wound in the skin and the Laryngeal wound was allowed to drain through a tube. In 1921 single stage operation

was suggested by Moor and Portman. There was again a set back to further development due to advent of Radio Therapy in 1929 through Radium bomb. Since then the treatment of Laryngeal cancer has been tossed between Radio Therapy and Surgery. There are points for and against each. Since then anaesthesia has improved. Physiological principle has been understood, Chemo-therapy and Antibiotics have come. They have given impetus to improved Surgical technique. Formerly Laryngeal carcinoma was divided into extrinsic and intrinsic but now it is divided anatomically as :

- (1) Supra Glottic.
- (2) Glottic.
- (3) Sub-Glottic.

The first one requires further classification.

- (a) Ventricular or Laryngeal Sinus.
- (b) Ventricular band or Vestibular sinus.
- (c) Ary-epiglottic fold.
- (d) Infra-hyoid portion.
- (e) Anterior and posterior commissures.

Lymph drainage.—A brief knowledge of the lymphatic drainage is necessary to understand, the suitability of treatment and to gauge the extent of metastasis. The vocal cord has got the minimum drainage. Sub-glottic region a little more and supra glottic the most.

Upper drainage area.—Above the vocal cord the lymphatic vessels leave the larynx at the lower border of the thyroid cartilage, along with the recurrent laryngeal nerve and vessels. They enter inferior cervical glands and turn to thoracic duct. Others descend in mediastinum along the tracheal wall and may give metastasis in inter-bronchial lymph glands.

Central area.—There is a gland in front of the crico-thyroid membrane in which vessels from anterior commissure and part of sub-glottic area drain. It is a closed circuit of larynx.

Classification of Cancer.—Macroscopic : Macroscopic Carcinoma : (a) Proliferative. (b) Ulcerative.

Proliferative.—Has regular and discrete margin and it is raised above the level of mucosa and looks like a papilloma. It is amenable to surgery and radio therapy.

Ulcerative.—Has raised or under-mined edges ; it metastasises early and hence not good for Surgery as for Radio Therapy.

Microscopic.—Broders classification still holds good. The 1st and 2nd group are much more amenable to Surgery and 3rd and 4th to Radio Therapy. Biologically the carcinoma can be divided into ; (1) Epidermoid (2) Squamous cell carcinoma which can be further sub-divided into : (a) Anaplastic (b) Prickle cell with cell-nests.

Anaplastic tumour has a chance of recurrence by Surgery but they do well with Radio Therapy—although local recurrence is not out of question.

Choice between Radio-Therapy and Surgery.—Radio-Therapy is not desirable when there is oedema because it indicates secondary infection or involvement of perichondrium. When unavoidable tracheotomy is done, Radio-Therapy is not good. Formerly early cases were treated by Surgery and advanced cases by Radio Therapy, but now reverse is the case.

Crossing of tumour on the other side in the anterior commissure is treatable by Thyrotomy or by Teleradium but not by interstitial radiation. Extension in vestibule and ventricular band can be treated by teleradium or by complete Laryngectomy. Tumour on posterior commissure will not respond to Radio Therapy. Tumour arising in cord and extending down or extending above are treated in a much better way, by Surgery. Supraglottic tumours should be treated with total Laryngectomy or by teleradium but not by interstitial radiation. If there are glands, block dissection is essential. Tumour arising from Ary-epiglottic fold may grow laterally, or medially. If they are

localized to one side and if there be no gland radio therapy may be good. In case it is spreading in nature laryngo-pharyngotomy is a method of choice. If tumour is located in supra-hyoid portion of epiglottis it can be excised through mouth or trans-hyoid pharyngotomy should be done. If it arises at the base of epi-glottis, its Surgical removal becomes difficult and hence teloradium is preferred.

Metastasis.—Spread of Metastasis is in the following order: (1) Pharyngeal Mucous Membrane. (2) Tracheal Mucous Membrane. (3) Ary-epiglottic space. (4) Cervical Lymph gland. (5) Thoracic Lymph gland. (6) Pre-laryngeal lymph gland.

Extension in Pharyngeal mucous membrane or Tracheal mucous membrane is indicative of deposits beyond the tumour. They are not usually seen and hence tomography is essential to locate them.

Extension in pre-epiglottic space is easy due to anatomic peculiarities. There is easy access from larynx and hence although operation has been successful, tumour recurs.

According to Lederman metastasis in Lymph glands occurs in the following manner:—(a) On tip of vocal cord-4%. (b) Sub-Glottic region-17%. (c) Supra glottic region-40%.

Method of Operation.—(1) Thyrotomy should be reserved for tumour of limited extent *i.e.* anterior 2/3 of a cord. It can be done under local anaesthesia. (2) Partial Laryngectomy has been favoured in France (Hautant later by Portman). It is not favoured in America or in England.

Total Laryngectomy.—It is better to remove 2 or 3 tracheal rings. Some people have removed up to six rings. Some people remove central portion of hyoid bone or total portion of hyoid bone, because of chances of metastasis. Now-adays narrow-field laryngectomy is not favoured because it has got no advantage and is full of risk.

Block dissection.—In block dissection, complete removal of glands along with surrounding tissue is aimed at. Block dissection on both sides should not be undertaken at the same time but if the growth has occluded the jugular vein of one side dissection can be undertaken on the other side without fear.

Skin incision.—The Gluck method of Horse-shoe shaped incision is favoured because the Pharyngeal opening is covered by the skin.

Cutting of Trachea.—Horizontal incision between the arm of two rings and the ring should be stitched to skin.

Oesophageal tube.—It can be left for four or five days to enable the healing of Pharyngeal mucosa but Birdsall of Golden Square Hospital, London does not use it at all.

Post-operative Management.—The patient is taken out of bed next day and is encouraged to walk.

Prognosis.—Tumour arising from cord has got good prognosis. Extension makes treatment more drastic and cure poorer. In some glottic tumours, radical Surgery is a method of choice. But the tumour extends round the mucous membrane of trachea and hence prognosis is not good.

Warning to Patient on Leaving the Hospital.—Patients are warned not to swim or to dive, not to climb trees, not to lift heavy weight, not to brood over loss of voice.

I must be frank to you that in selecting cases for Laryngectomy I have not taken scientific precaution which I have enumerated above due to various difficulties but the initial encouragement which I have got after doing these operations should make me wiser in selecting future cases. I will try to submit the subsequent results of these operations to this assembly.

Tube Feeding Formula.—5 eggs, 1½ srs. milk, 1 cup klim (dried whole milk), ½ cup lactose (Milk sugar) and ½ cup water, 4 ozs. strained spinach, peas or carrots, salt 1 teaspoonful.

Method of preparation.—Klim heated into milk, salt added, egg beaten up and vegetable strained, Lactose boiled with water to dissolve. All ingredients combined, Strained and put in refrigerator.

Feedings. Six to be given - 6 a.m., 9 a.m., 12 Noon, 3 p.m., 6 p.m., 9 p.m. 12 ozs. of formula at each feeding—each time beaten and heated to body temperature, 3-4 ozs. of water to run in after each feed (small amount of water to be given before feeding to clear the tube).

Further.—4 ozs. of freshly squeezed orange-juice at noon and 6 p.m. in addition to formula, 1 table spoonful cod-liver oil to be included in any one feed.

Amount of feeding.—To be altered and adjusted. In case of diarrhoea - water or boiled milk to be substituted for the feeding for 24 hours.

I gratefully acknowledge the help which I got in my operative work by the following of my colleagues:—Dr. R. N. Sinha, Plastic Surgeon. Dr. A. K. Sinha, E. N. T. Surgeon. Dr. Mukteshwar Prasad, Chief Anaesthetist. Dr. G. P. Keshari. Dr. Chedi Chowdhary and Host of Housemen.

CASE No. I

Name - Mr. A. C. West. Age - 60 years. Sex : Male. Religion - Christian. Occupation - Retired Military Official. Date of admission - 9th June 1955.

Complaints.—(1) Breathlessness - 9 days. (2) Frequent attacks of hoarseness - two years, but persistent hoarseness for the last three months.

History of present illness.—About two years back the patient was perfectly right. Then he had an attack of hoarseness which lasted for two days and the voice recovered. Since then for one year and nine months he had innumerable attacks of hoarseness sometimes lasting for a few hours and at times

Laryngectomy

CASE I



Soon after operation



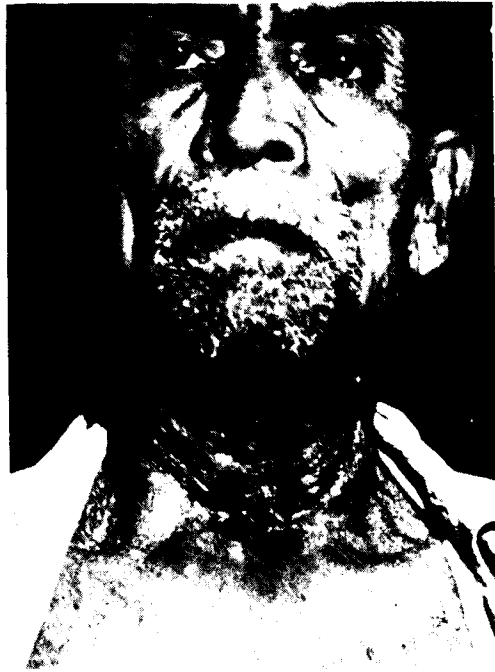
Microphotograph of growth larynx



Macroscopic appearance of growth larynx



CASE - II



After cure



Microphotograph of growth larynx



Macroscopic appearance of growth larynx

longer but never more than three days followed by recovery of voice. He does not remember nor can he tell the number of attacks approximately but for the last three months hoarseness is persisting. Since eight days he is getting difficulty in breathing and also breathlessness. He never had any difficulty in swallowing.

Previous to this he was feeling quite fit and only 15 days ago he was capable of long walks (5 to 6 miles) but now even slight exertions cause breathlessness.

Past history.—Suffered off and on from recurrent attacks of hoarseness for the last one year and 9 months but voice always recovered.

Family history. Wife alive, healthy, has one son - keeping very good health, has one daughter - quite healthy, no history of tuberculosis or carcinoma in the family.

Social history.—All along till his retirement he had a very active life, very heavy smoker used to smoke about 2 oz. of tobacco and 40-50 cigarettes a day, stopped since 3 months. Not addicted to drinks.

Social history.—All along till his retirement he had a very active life.

General examination.—Markedly run down in health and general appearance restless and orthopnoeic. No jaundice, no oedema, not anaemic, no cyanosis. B. P. 152/92 m.m. Hg. Pulse - 96/mt. regular volume and tension - fair. Respiration - 45/mt. shallow. Heart, Lungs, Abdomen - No abnormality detected. Tongue - clear and moist, mouth and gum - healthy. Teeth - artificial denture. Nose - clear, mucosa - normal, throat - normal. Tonsil - buried. Larynx - Growth involving the right ventricular band extending behind, oedema of the false vocal cord present, Glands in the neck palpable. These were found on indirect Laryngoscopic examination and growth was suggestive of malignancy. Patient had bed sore of the size of 2 m.m. circumference.

Investigation.—Blood - Total R. B. C. - 5.6 million cu. mm. H. B. - 90%. Total W. B. C. - 9,850 cu. mm. Diff. W. B. C. - Poly - 72%, Mono - 3%, Lympho - 17%, Eosino - 8%, Baso - nil. E. S. R. - 40 mm/1st hour. B. T. 30 secs. C. T. - 3 min. 5 secs. Urine - Sugar - nil. Albumen - nil. Blood W. R. - Negative.

Treatment.—For three weeks the patient was kept on conservative line of treatment but did not show any relief, streptomycin and Penicillin therapy was started on 4-7-55 i.e. 32 days before the operation.

On 7-7-55. Laryngectomy was done under General anaesthesia by Prof. P. N. Sinha and the following transfusions were given during operation:—Saline - 3 pints. Blood - 4½ pints. Plasma - 1 pint.

In the night 3½ pints of Saline was again given.

After the operation the patient showed persistently low blood pressure for which Percoten injections were given intramuscularly and repeated every 6 hours. Mathedine Lawofed one ampoule added to 1 pint of glucose saline continued drip one third at the rate of 15 to 20 drops per minute. I. V. was given on the advise of Prof. M. Das. General sedatives were given.

Anti-biotics penicillin, streptomycin and terramycin given. Vitamins were also administered parenterally.

11-7-55. The patient brought out the stomach tube but on giving food, fistula was discovered hence it was reinserted.

14-7-55. The patient's bed sore increased in the sacral region excessive amount of salivation, fistulous opening was more or less in the same condition salivary secretion used to come out through the fistula as well.

18-7-55. The patient could stand up and walk but because of his weak condition and due to persistent bed-sore could not sustain properly. Examination of pulse showed irregularity in beats.

21-7-55. He was examined by Cardiologist Dr. Shree-niwas Sinha and the following observations were made. No history suggestive of recent coronary Episode P - 90 minute regular except for frequent premature beats. Blood pressure 122/65 mm. Hg. Heart - Sound of good tone P A. Chest - A few scattered rales.

The premature beats are of no particular significance and will pass off in due course.

Fistula persisted but more on right than on left. Appearance of fistula sodden due to constant moistening being done by increased Salivary Secretion.

28-7-55. Fistula still persisted and the patient was rather ill and it was decided to do Gastrostomy.

2-8-55. Gastrostomy was done by Dr. R. N. Sinha, Plastic Surgeon.

17-8-55. The patient was found very cheerful nourishment also markedly improved but bed-sore persisted. Fistula also persisted but appearance found much better.

2-9-55. Fistula still persisting but left side much less than the right side. Patient was found in irritable mood and was thinking of packing off to home. He was reassured and persuaded by Prof. P. N. Sinha to stay.

17-9-55. Bed sore was much better and fistula on left side practically healed up; on right side still persisting. Attempt was made to feed him through mouth. Patient expressed inability to chew but attempt was insisted upon.

2-10-55. Patient could take solid food easily by mouth but there was small leakage through right fistulous wound when liquid was given.

Patient would not allow taking away the Gastrostomy tube for fear of regurgitation of food through fistula.

8-10-55. On examination of the wound and surrounding skin looked quite healthy, no fistula. Patient can swallow liquid

semi-solid and soft solid diet at ease without any leakage or trace of excessive salivation.

14—10—55. Patient developed cough with expectoration mixed with small amount of blood, as also some blood was present in saliva. X-Ray chest done. Nothing abnormal in lung field or mediastinum. But for caution sake, patient was kept on Strepto-penicillin injection (0.5 gm. plus 4 lacs). Other conditions fast improving. Patient cheerful, appetite good sleep sound, bowel regular, and no difficulty in swallowing or breathing.

19 10—55. Patient has started smoking cigars on Surgeon's permission.

21 10—55. Crusts formed in trachea near the external operative opening and patient started getting spasmodic cough with intermittent sign of respiratory obstruction. On immediate dislodgement of thin blood tinged crusts with small forceps with-out force, patient felt easy, and comfortable. Rest as before. Patient taking solid food including one seer of meat (cutlets etc.) each day.

Tonics by mouth and injection of Streptopenicillin continued.

Surgeon contemplating to close the Gastrostomy opening very soon.

10 11—55. Gastrostomy closure could not be performed because of an attack of acute rhinitis with slight pyrexia postponed till some time after a fortnight.

24 11—55. Patient's general conditions are quite normal. No sulpha or antibiotics being given. Fersolate and Multivitamin tablets and good nourishing diet continued. Patient keen to go home specially for X'mas.

Subsequently bed sore healed and fistula also healed. His gastrostomy wound was closed in December and he was discharged from Hospital.

CASE No. II

Name - Asmat Ali. Age - 60 years. Sex - Male. Religion - Mohammadan. Occupation- Cultivation. Date of admission 9 7 '55. Date of discharge - 31 8 '55.

Complaints. (1) Hoarseness - duration - 6 months. (2) Increasing breathlessness - duration 1 month. (3) Difficulty in swallowing (feeling of obstruction during deglutition) - 1 month.

History of present illness. Six months back he had no such complaints except ordinary attacks of cough and cold which used to be relieved by simple local treatments. For the last six months attacks of cough and cold have been almost continuous and very severe. About four months back his voice became hoarse which has increased with the time. For the last one month he has noticed difficulty in swallowing for both solids and liquids, feeling a sense of obstruction. For the last one month he also suffers from breathlessness.

Past history. Nothing particular.

Family history. Nothing particular.

Personal history. Not addicted to drinks but chews Khaini.

General examination.—Apparently healthy, no cyanosis, no jaundice, no anasarca, anaemic. Pulse - 96 per mt. regular - volume and tension fair. Respiration - 28 per mt. irregular. B. P. - 112/72 m.m. Hg. S/D. Chest - Heart - no abnormality detected. Lungs - no abnormality detected. Abdomen - no abnormality detected. Other systems - No abnormality detected. Gums and teeth - unhealthy. Tongue - moist and clean.

Local examination. Extensive growth on right side of larynx with respiratory distress. Because of respiratory distress the lesion could not be demarcated but tumour mass was lying on right side.

Investigation. Blood : Total R. B. C. - 3.6 million. Total W. B. C. - 6950 cu. mm. Diff. Count - Poly - 60% Lymph - 35% Mono - 2% Eosino - 3% Baso - nil. B. T. - 35 secs. C. T. 2 min. 50 secs. W.R. - Negative. E.S. R. 1st hr. 15 m.m. 2 hr. 45 m.m. Urine - Reaction - Alkaline. Sugar - Nil. Albumen - nil. Sputum - No A. F. B. found.

Patient had a few very loose teeth which were extracted. His blood examination reports showed anaemia of a degree not permitting a major operation. Hence he was given blood transfusion.

On 18-7-'55 - 250 c.c. On 23-7-'55 - 500 c.c.
On 22-7-'55 - 250 c.c. On 25-7-'55 - 300 c.c.

He was meanwhile receiving - Pulv. Alkali, Multivitamins - orally. Liver Extract, Betamind. Cetamid - by injection. Avil (during blood transfusion).

Laryngectomy. 26-7-'55 - 8-30 a.m. Atropine Sulph gr. 1/100 injection subcut.

9 a.m. Nitrous oxide - Oxygen & Ether anaesthesia with Boyle's apparatus started and endotracheal tube passed.

10-10 a.m. Skin incision (U) over neck. Muscles excised with diathermy knife one metastatic gland firmly adherent to left Sterno-cleido Mastoid Ms. removed with a portion of the ms. blood vessels ligated and thyroid separated with Laryngectomy done. Tracheal opening well guarded with the anaesthesia tube inserted in it. Repairs completed and stomach tube inserted and fixed.

2-21 p.m. Skin stitched. Metal tubes, well padded on all sides fixed into the tracheal opening. Tight bandage applied B.P. - 140/100 mm. Hg. Pulse - 110/mt. Respiration - 26/mt.

2-45 p.m. Patient transferred to ward in a satisfactory condition. In the ward, patient was kept on Pethidine - 1 amp. at 3-00 p.m. Penicillin - 1 lac I. M. 6 hrly. Terramycin - I. M. 6 hrly.

Blood transfusion and Saline were stopped under instruction of Surgeon and Anaesthetist.

27-7-'55. Patient all right. Urine passed 3 ozs. in morning. Glucose Saline given through stomach tube B.P. 140-150 80-85 mm. Hg. maintained. Pulse 90/mt. regular, fair. respiration 20/mt. rhythmical 30 oz. of fluid (glucose Saline and milk) intake 26 oz. of urine passed. Antibiotics continued. Slightly restless at night.

3-8-'55. Wound cleansed, alternate stitches removed. No sign of any fistula.

5-8-'55. All stitches removed. Wound dressed and bandaged. Nothing wrong. Stomach tube removed and milk given in sips by mouth. No leakage from any where. Patient very cheerful.

14-8-'55. Patient complained of slight leakage of milk through a small opening about $1\frac{1}{2}$ " above the tracheal opening. Wound cleansed and dressed. Patient advised to take milk, egg-flip Khichri with slight finger pressure on the leaking point during deglutition.

20-8-'55. Patient all right. Eating solids and liquids without any leakage from anywhere. No fistula. No pain or tenderness over front or sides of neck. Patient walks well and remains quite cheerful. The following day he was discharged.

HISTOPATHOLOGY

Gross appearance.— The Specimen consists of the whole of Larynx and a few rings of trachea measuring 9 c.m. $\times$ 6 c.m. (at the widest part) $\times$ 4 c.m. Diameter of lowest part = 2 c.m. A mass occupying the inter arytenoid fold, the arytenoid, coniform and corniculate cartilages and the soft tissues between them obliterating the normal outline of the part. The pyriform fossa is also wiped out of existence and the ary-epiglottic fold is eroded. The growth is smooth, firm, cuts without resistance, cut surface displays necrotic tissue and eaten-up cartilage. Vocal cords and vocal folds could not be discerned.

Microscopic appearance. The section consists of cords, columns and sheets of epidermoid cells forming lizzarore pattern. Area of compressed cells with attempt at the cell nest formation are also present. Lymphatic permeation by the tumour cells and lymphogenous metastatic behaviour are in evidence. Usual stromal pattern, fibrosis, and round cell infiltrations are present.

DIAGNOSIS: EPIDERMOID CARCINOMA

Further observation. There is the form of mucous gland. Several spaces which are lined by layers of epithelial cells are also seen. The spaces are filled with sheets of epithelial cells all showing hyperchromatism frequently and occasional mitosis and all free of cell nests.

CASE No. III

Name - Mr. M. A. Wajeed, Age - 70 years. Sex - Male. Religion - Mohammadan. Occupation - Mokhtar. Date of admission - 5-8-55.

Complaints.—(1) Cough dry type - since 2 months. (2) Difficulty in deglutition - 4 months. (3) Hoarseness of voice - 4 months. (4) General weakness - One year.

History of present illness. The patient was keeping quite fit one year back when he started having gradually weakness with progressive loss of weight. Later-on he noticed some change in his voice which became hoarse. Four months back he also suffered from difficulty and pain on deglutition both for solid and liquids. Sometimes he used to have earache on the left side. Since two months he is having dry type of cough occasionally persistent in nature.

History of past illness.—Nothing particular.

Family history.—Nothing particular. No history of tuberculosis or carcinoma in the family.

Personal history.—Before this the patient had very good health. Not habituated to drink or smoke.

CASE - III



Microphotograph of growth larynx



Macroscopic appearance



Microphotograph

CASE - V



Microphotograph of laryngeal growth

General appearance.—The patient is run down in health and general appearance. Anaemic, no cyanosis or breathlessness. No jaundice no oedema. Pulse - 88 mt. regular volume fair. Respiration - 28/mt. regular. Temperature - 98.6 F. Tongue - clean and moist. Gums and teeth not healthy, many teeth missing. Nose - Mucosa slight congestion. Throat - mucosa normal, tonsil healthy.

Local examination. On indirect laryngoscopy irregular growth on both sides involving the vocal cord, arytenoids and aryepiglottic folds and posterior root of tongue. The appearance of the growth was suggestive of malignancy.

Investigations.—(1) X-Ray of chest done both lung fields clear. (2) Blood - Total R. B. C. - 4.9 million cu. mm. Total W. B. C. - 6850/ cu. m.m. Diff. Count - Poly - 60% Lympho - 35% Eosino - 2% Mono - 3% Baso - nil. Hb. - 84% B. T. - 20 secs. C. T. - 2 min. 20 secs. W. R. - Negative. B. P. - 118/78 mm. hg. Urine - Sugar - nil. Albumen - nil. Sputum - No A. F. B. Found.

Diagnosis.—Extrinsic carcinoma of larynx.

On 6-8-55 the patient was referred to dental department for examination of teeth. Only four teeth were remaining one was shaky but he refused extraction.

12-8-55. Patient condition same. Fersolate and Multi-vitamin therapy started.

16-8-55. Pre-operative Penicillin and Streptomycin was started.

18-8-55. The patient was operated under Ether and Gas-Oxygen anaesthesia and total laryngectomy was done by Prof. P. N. Sinha, D.L.O., D.O.M.S. Four pints of blood and four pints of Saline were given during operation. No postoperative bleeding.

Patient kept on Penicillin—1 lac vial Intra-muscular four hourly, Terramycin Intra-muscular—I vial six hourly Pethidine (100 mgm.) sub-cut. when needed. Percoten 1 amp. injected.

B. P. between 152/86 - 122/78 mm. hg. Pulse between 148-100 per mt. regular, fair. Respiration between 24-16 per mt. hythematical.

19-8-55. Patient very restless since early morning and trying to undo the bandage on neck. Urine not passed. Doing some beckonings not understandable at all. Glucose Saline given through stomach tube. Shown to a physician who was of the opinion that it was all due to nervousness and apprehension.

20-8-55. Patient had sound sleep last night. At present quiet and smiling. Trying to write on slate and papers and words cannot be read due to his tremor which was present before the operation. Blood pressure, Pulse and Respiration within normal limits. No bed sore any where.

22-8-55. Wound cleansed, dressed and bandaged. Drainage removed. No discharge or bleeding. Liquid feeds through stomach tube. Patient keen to get down from bed and offer prayers (*Nimaz*) Bowels moved a little. Urine passed about 16 ozs. in total.

29-8-55. All stitches removed. Discharge from the middle upper margin of the tracheal opening - ? Fistula? Stomach tube removed and milk given to swallow. Some leakage through the fistula but same passed down into stomach also. Dressing and bandage applied stomach tube re-inserted for feeds.

9-9-55. Fistula persisting. Patient taking nourishment through stomach tube. Walks and keeps cheerful. Bowels regular and urine out put normal.

19-9-55. Fistula almost healed. Very slight leakage of sticky milk like fluid on pressure above the neck. Patient very much tired of stomach tube and removed it himself, would get it reinserted after much convincing. Wants to take food without it but for fear of widening or re-infecting the healing tract he was persuaded to go on like this for a week or so more.

29-9-55. Patient has become very non-co-operative. Removed bandage and stomach tube and tries to run away from hospital. Nourishment suffering, weakness increasing, running fever (Temperature 99 - 101 F.) Getting alkalis, Fersolate, Vitamins, Hydro protein by mouth and Penicillin, Liver Extract, Betamid, Citamid by injections.

7-10-55. Patient although weak has become very desperate. Does not take feeds through stomach tube, runs away from bed every now and then. In the afternoon he was made to lie on bed and two persons deputed to attend on him. He wants to meet his relatives who dont turn up to see him now. Receiving I. V. glucose injection. Pulse 100/mt. slightly freeble, regular B. P. 112/73 mm. Hg. At 8-10 p.m. Patient died.

HISTOPATHOLOGY

Gross appearance. The specimen consists of larynx carrying the growth and few rings of trachea measuring 10 c.m. $\times$ 7 c.m. $\times$ 2 c.m. A cauliflower like growth was found occupying the whole of the larynx and a portion of epiglottis situated mostly on the left of the midline of the larynx. Pinkish white with dark brown spot firm. A portion of right aryepiglottic fold and inter arytenoid fold uninvolved. Vocal cords were still visible.

Microscopic appearance.—Sheets cords, strands, group of irregular protiferating stratified squamous Epithelial cells are found in fibrovascular stroma infiltrated with round cells and plasma cells. These tumour cells are atypical and some of them show evidence of lipolitic degeneration and ballooning appearance. Spread by lymphatic permeation is also noticable.

Diagnosis.—Epidermoid Carcinoma.

Further observation. Sheets of epithelial cells resembling squamous cells with empty spaces here and there. Cytoplasm of the cells are vacuolated and reticulated. Mitosis and giant nuclii is seen frequently. Stroma is heavily infiltrated with inflammatory round cells.

CASE No. IV

Name - H. N. Srivastava. Age - 55 years. Sex - Male.
Religion - Hindu. Date of admission - 24 7 55.

Complaints.—(1) Breathlessness - since 1 day. (2) Hoarseness - since 2 months. (3) Difficulty in swallowing - since 6 months.

History of present illness. About 8 months back the patient started having dry type of cough which at time used to increase in severity. Then he began to feel difficulty in swallowing specially for solid food. Sometimes accompanied by pain radiating to the right ear. With all these troubles he was taken to Lucknow Medical College Hospital where he was suspected to be a case of carcinoma larynx. Biopsy was done and report came as Epidermoid Carcinoma. The patient was then referred to this hospital. Radium therapy was started on 22nd July but immediately afterwards he developed breathlessness and was admitted through the emergency ward of the hospital.

Past history. All along the patient was having very good health before these troubles started. He has got bilateral inguinal hernia duration 18 years.

Personal history. Heavy smoker, addicted to drinks as well.

Family history. Nothing particular. No other member in family has suffered or died of cancer to the best of their own knowledge.

General examination. Patient is markedly run down in health, emaciated breathlessness present. No jaundice, no oedema, no cyanosis. Anaemia present. Pulse - 86 / minute. regular. volume and tension - fair. Respiration - 36 per minute. B. P. 136/84 mm. Hg. Heart, Lungs, Abdomen - Nil abnormal.

Local examination. The whole larynx was filled with a mass of growth and was actually extending down the trachea

which was really the cause of suffocation. The growth was originating from cords and sub-glottic area.

Investigation.—Blood - Total R.B.C. - 4.8 million/c.mm. W. B. C. - 6,850/cu. mm. Diff. Count - Poly - 61%. Lympho - 32%. Mono - 4%. Eosino - 3%. Baso - nil. B. T. - 30 secs. C. T. - 2 mt. 30 secs. Urine - Reaction - Alkaline. Sugar - nil. Albumin - nil. Sputum - No A.F.B. Seen. X-Ray chest - Within normal limits.

Diagnosis.—Carcinoma larynx with extensions all round. For one week the patient was kept on conservative line of treatment. During which, he had occasional bouts of severe breathlessness with some cyanosis and for which oxygen inhalation and 6 hourly Intramuscular Coramine was given. The patient did not show much relief but was having respiratory distress hence it was decided to do tracheostomy.

1—8—55. Tracheostomy was done. Patient became quite well as regards respiration.

17—8—55. Patient's general appearance same but there is no breathlessness. One pint of blood transfusion was given in preparation for laryngectomy.

21—8—55. Irregular growth was shown growing into the tracheotomy tube but air way remained patent although narrowed down.

23—8—55. Total laryngectomy done under endotracheal Nitrous Oxide - Oxygen - ether general anaesthesia. No complications during operative procedure except when severing the tracheal rings due to extension of growth down wards as also due to previous tracheotomy a little difficulty was encountered. Blood pressure, pulse, respiration all remained within good limits. During and after operation 4 pints of blood and 3 pints of glucose saline were given.

Slightly cyanosed face after transfer to ward was corrected by somewhat loosening the bandage round the neck. Oxygen was given immediately. Patient was kept on Penicillin 100 thousand Units 4 hourly, Terramycin Intramuscular 1 vial 6 hourly. Intravenous Saline and blood was stopped. Patient opened eyes and felt better, on 24-8-55. Bowels not moved. Urine not passed till 1 p.m. after hotwater application in urinary bladder. B. P. 140/80, Pulse 104/mt. Respiration 30/mt. on average, heart : sounds distinct. Lungs clear. Abdomen soft. Glucose Saline by mouth through the stomach tube.

28-8-55. During dressing, fistula was noted at the close point one in the middle and the two on right and left of the tracheal opening with leakage of salivary secretions into trachea and reflex cough with expectorations.

Operative wound was scrupulously cleansed, dressed and bandaged. Fluid diet was continued through the stomach tube. Penicillin and Terramycin as well as liver extract and vitamin continued as injections. Patient remained very co-operative and remained quiet and satisfied.

1-9-55. Fistulae still present. Slough almost gone and wound showing signs of healing, In the after noon patient had rigour and then fever (104 F) blood films showed no M. P. still Mist Quinine Sulph. was given through the tube.

4-9-55. No rigour. Fever 100° F - 102° F. Wound healing very well. Metal tube was replaced by adult sized No ; 4 Rubber tracheal tube.

10-9-55. Alright. Pain shoulder present, in right. Infra-red rays exposure on that region.

30-9-55. A febrile. Pain shoulder present. Bowels constipated.

10-10-55. Operative wound healed and dried. Patient complained of excessive salivation most probably due to persistent presence of stomach tube. Slight perspiration during night, weakness marked.

13-10-55. Stomach tube removed. Spoonful of (Khichri) taken by mouth causing no leakage from the old places of fistulae and no discomfort to patient. Since then patient started taking solids and gaining in weight. No fever, No perforation. No constipation. Walking within the wards. But shoulder pain present on both sides.

20-10-55. Patient has gained weight. Tracheal tube removed. Patient keeps a mask on the tracheal opening. Talks and laughs among other patients with the help of lips and hands and walks within the premises. Bowels regular. Shoulder pain persisting.

27-10-55. Formation of crusts within trachea near the external operative opening. Sometimes dislodged automatically by spasmodic cough and respiratory distress relieved, at other times dislodged with the help of sterile swab-sticks or small curved forceps without traumatising tissues. Otherwise patient within normal limits.

5-11-55. While taking solid food, a piece of meat got stuck in throat lower down and patient had dysphagia but relieved very soon. After he was given juice of raw papaya (Papita) which has got the properties of digesting or liquifying meat.

13-11-55. Crust formation persisting and intermittent periods of respiratory distress due to mechanical obstruction and automatic or applied reliefs with removal of obstruction still persisting. External tracheal opening was marked to gradually narrow down in lumen. Hence a No ; 3 sized rubber tracheal tube was inserted and fixed with the help of tapes tied behind neck. Patient's apprehensions almost relieved.

15-11-55. On palpation of the submandibular region there was a firm glandular feeling painful and tender. Advised deep X-Ray exposures over this region.

Meanwhile patient having liver extract and Betamid injection on alternative days. Fersolate and Multivitamin tablets one each T. D. S. Hot compression over the tender regions.

Otherwise patient within normal limits.

HISTOPATHOLOGY

Gross appearance.—The specimen consists of the larynx carrying the growth measuring 8 c.m. $\times$ 5 c.m. and involving the whole of larynx, the epiglottis and the surrounding soft part. It was ulcerated over a wide area 6 c.m. $\times$ 4 c.m. The left cord could only be made out on close examination.

A portion of the growth was taken for microsection examination.

Microscopic appearance.—The fibro vascular stroma with patchy chronic inflammatory infiltration is seen enclosing sheets of cords, strands, groups of islands and interlacing branches of irregular proliferation. Squamous epithelial cells with hyperchromatic nucleus, vascular nuclei mitotic figures ballooned up cells and unsuccessful attempt at division. Some of these having unsuccessfully permeated by lymphatic vessels and permeating along their walls and enclosing by pincer movement areas of mucous glands.

Diagnosis.—Epidermoid carcinoma.

Further observation.—Superficial layer of epithelium is necrotic and ulcerated. The subepithelial tissue has been invaded by sheets of well differentiated squamous epithelial cells. Most of the cells contain hyperchromatic nuclei. Mitosis is observed frequently.

CASE No. V

Name : Kishun. Age 50 years. Sex Male. Religion Hindu. Occupation Cultivation. Date of admission 1—9—55.

Complaints.—(1) Pain in throat with difficulty in deglutition since Seven months. (2) Hoarseness of voice - since four months. (3) Swelling neck.

History of present illness.—About 7 months back the patient was completely alright when he started having recurrent attacks of dry cough. This used to be relieved by ordinary symptomatic treatment. After one month he began to feel pain in throat at times accompanied by pain in deglutition which gradually progressed Since four months he has been suffering from hoarseness of voice of increasing intensity. Three months back he noticed a small swelling on neck left side. These troubles are persisting.

Past history.—Nothing particular except that he suffered from frequent attacks of cough.

Family history.—Nothing particular. No history of tuberculosis or cancer in the family.

Personal history.—He is a cultivator by occupation and all along he has been keeping good physique before he started having these troubles. Addicted to Khaini (Tobacca chewing). Not addicted to alcohol in any form.

On examination.—General markedly run down in health and general appearance. Slightly anaemic, no jaundice, no cyanosis, no oedema.

Pulse 78/minute, regular, Volume - fair. B. P. 128/78 mm. Hg. Respiration - 28/ minute. Temperature - 98.6 F.

Local examination.—Gums and teeth unhealthy. Nose - Mucosa normal. Throat - healthy, tonsils - buried. Larynx - A fungating growth on the right side extending to the pyriform fossa and uvula with involvement of glands. Lymph nodes on the right side neck palpable of moderate hardness. Circulatory System - no abnormality detected. Respiratory system - no abnormality detected. Gastro - intestinal system - no abnormality detected.

Investigation.—Blood - Total R. B. C. - 4.2 million / cu. mm. Total W.B.C. - 14000 / cu. mm. Diff. Count - W.B.C. - Poly - 78%. Lympho 17%. L. Mono 2%. Eosino 3%. Baso nil.

Hb. 90%. B. T. 25 secs. C. T. 2 min. 30 secs. W. R. Negative. X-Ray chest - Shows both lung fields clear. Urine Sugar nil. Albumin nil.

Diagnosis.—Extrinsic carcinoma of larynx with sec. involvement of lymph nodes left side of neck.

OPERATION

6—9—55. 10 a.m. Atropine sulph gr. 1/100 injected subcut.

10-30 a.m. N₂O-O₂-Ether anaesthesia with Boyle's apparatus started and endotracheal tube inserted.

11-15 a.m. Skin incision made over neck. The single flap turned up wards and protected with a moist tetra. Infrahyoid muscles divided, deep fascia incised. Then sterno hyoid and inferior belly of omohyoid separated and similarly cut. Int. laryngeal nerve and sup. thyroid artery divided and ligated. Sterno-thyroid and sterno-hyoid muscles divided and thyroid gland exposed, as also carotid sheath separated from the lateral lobes of thyroid cartilage, Inferior constrictor muscles were secured as also the external laryngeal nerves, with much difficulty on the right side because of indurations due to extension of malignancy on this side. Isthmus was separated, ligated and divided. Thereafter larynx was made freely movable from all sides and removal affected from above the epiglottis, which was very much adherent to structures within. After laryngectomy was performed irregular growths were seen extending on towards throat and two masses of round growth were again excised including maximum of the extensions. These extensions were unexpectedly found above this stage of operation. After removal of larynx repair work of pharynx was under taken. Then the upturned skin flap was brought into its position and skin sutured with two drainage tubes one at a higher level than the other. Stomach tube inserted through mouth and fixed into the tracheal opening pads placed and neck tightly bandaged.

During the operation, 3 pints of blood and 1 pint of Saline were transfused. No anaesthetic complications B. P. remained between 148/92 - 106/76 mm. Hg., Pulse between 156-130 per

mt. Respiration regular without any embarrassment a suction was always in use near the tracheal opening during later stages of constructive operation.

2-30 p.m. Patient transferred to ward in Bed No. 20. Pethidine (100 mgm.) injected, Terramycin I. M. started 6 hourly, record of pulse, respiration and B. P. at 15 mts. interval. Oxygen cylinder and suction pump kept near patient for any eventuality.

7-9-55. Patient awoke in normal senses. Had sound sleep from 10-30 p.m. Pulse 128/mt. regular, fair B. P. 140/76 mm. Hg. Respiration 26 per mt. rhythmical. No stool passed, no urine passed. Glucose-saline given through stomach tube. Hot water bottle on urinary bladder, a little urine passed about 1½ oz. Terramycin I. M. continued.

14-9-55. Stitches removed. A mid-line fistula present. Wound cleansed, dressed and bandaged. Feed through stomach tube Afebrile can sit up by himself slight cough present, Tr. codeine Phos. and Penicillin injection being given.

20-10-55. Patient very much tired of feeding through stomach tube and inspite of persuasions specially with reference to fistula persisted in demanding removal of stomach tube. Stomach tube was removed and patient was watched to take milk with firm pressure with pressed gauze on fistula during deglutitions. Milk passed down without leakage anteriorly. Patient's attendant and doctors encouraged and he was asked to swallow liquid in that manner.

4-10-55. Patient other wise normal. Wound and fistula dressed and bandaged. Patient took "Khichri" of his own accord and there was no trouble.

6-10-55. While taking "Dal-Bhat" patient got spasmodic cough with lot of tracheal secretions. Developed pain in upper part of chest. Sedatives and antibiotics given. Stomach tube inserted again for feeds.

10--10--55. Patient again insisted on removal of stomach tube which was very reluctantly done. Semi-solid feed by mouth.

17--10--55. Pain in the whole of chest both sides. Cough increasing in intensity with lot of thick expectorations. Sedatives and antibiotics continued. Temperature varying between 99°-101° F. General condition on the lower side.

19--10--55. Cough, fever, malaise on the increase. Referred to Prof. M. Das, who advised X-Ray chest. X-Ray chest P. A. view done. Extensive pyopneumothorax of the left side and bronchial fistula shown. Sedatives and antibiotics continued.

21--10--55. Referred to Prof. U. P. Sinha for paracentesis and drainage. Patient transferred to E. N. T. operation theatre. Every thing ready for puncture and drainage when patient all of a sudden had a paroxysm of cough. He was turned down, on left side with head end lower down and postural drainage affected which cleared about 1½ pint of foul smelling purulent discharge and patient felt better thereafter. Paracentesis was postponed and postural drainage advised along with antibiotics like Penicillin and Streptomycin and sedatives.

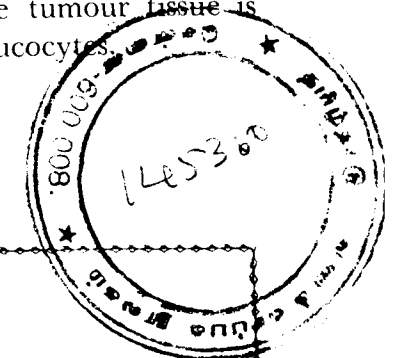
27--10--55. Patient going down hill inspite of all medical care. Bowels irregular, pain abdomen and tympanitis present. Antispasmodic mixture and Hydroprotein and I. V. Saline being given. Expectorations are always foul-smelling. General appearance of dehydration and emaciation. Temperature 97-100.8 F, Pulse 142/mt, volume and tension low. Mentally very much worried. Attending wife disturbing him all the time with crying and weeping.

1--11--55. Patient afebrile. Pulse 122/mt. volume and tension fair, cough and apprehension much lessened. Bowels moving, No pain in abdomen and very slight acting in chest. Wound dried up and very slight leakage of saliva through mid-line fistula.

3--11--55. Patient was almost as 2 days before till 12-30 p.m. when he started feeling drowsy, limbs started getting cold and clammy, pulse feeble and quick. I. V. Saline with coramine started conditions remained deteriorating till 1-45 p.m. when he collapsed and expired.

Histopathology.—The surface is ulcerated. The floor of the ulcer consists of sheets of epithelial cells showing alveolar arrangement. Most of the cells contain abundant cytoplasm and resemble epithelial cells. In most cells the cytoplasm appears vacuolated and reticulated. The nuclei show prominent nucleoli. Mitosis is observed frequently. The tumour tissue is also moderately infiltrated with polymorph leucocytes.

Diagnosis.—Epidermoid carcinoma.



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OBITUARY

It is with great regret we record the death of Dr. T. S. Shetty, M.D., Honorary Ear, Nose, Throat Surgeon, Government Royapettah Hospital, Madras, on 22-5-'57 after a brief illness. Dr. Shetty was a popular member of the medical profession in Madras, and an active member of the Association of Otolaryngologists of India having served in the capacity of a member of the Editorial Board of the Indian Journal of Otolaryngology. He was a member of the Madras Medical Council. Genial by temperament and quite friendly in his attitude, the medical profession in general and the E.N.T. Specialists in particular have lost one of their best friends.

May his soul rest in peace.

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