LARYNGOCELES

By S. HOROWITZ (Glasgow)

LARYNGOCELE is a condition not commonly encountered and although from time to time reports and reviews have appeared in the literature only some eighty cases have been recorded. About 10 per cent. of these were said to have been infected, forming pyoceles.

The condition was first recognized as long ago as 1829, when Larrey, a surgeon in Napoleon's army of occupation in Egypt, observed tumours in the neck of blind men, who were employed in reciting prayers every hour of the day from the temple minarets. He noted that these tumours were air-cysts in the soft tissues, and that their presence ultimately led to aphonia and caused symptoms of venous compression.

It was Galen (A.D. 300) who first observed a slit between the true and the false cords of the larynx. Morgagni (1741) described it more fully and it is his name this ventricle bears. These authors gave only an incomplete account. The first detailed and accurate description dates back to 1837, when Hilton carried out a series of fine and elaborate dissections of this space. It goes to his credit, that he drew attention to the anterior upward projection of Morgagni's ventricle to form in its anterior third a vertical blind pouch, known as the laryngeal sacculus or laryngeal appendix.

The first anatomical description of bilateral external laryngoceles was published by Bennet (1865) in Dublin. Since then seventeen specimens have been described. Of the seventeen recorded specimens, fifteen occurred in males and nine of them were bilateral. The proportion of males to females is not so marked in clinical cases as it is in anatomical specimens, and according to Watkins (1935) there is no clinical or anatomical sex distribution.

Embryology and Anatomy

The ventricle is present only in the larynx of mammals. It is formed by the splitting of the common thyro-arytenoid sphincter of primitive types into two parts, an internal or lower and an external or upper division. The upper division becomes the false cord, the lower becomes the true cord. Between the two divisions a recess is left and this excavation represents the ventricle. Embryologically the saccule appears at the end of the second month of fœtal life. It issues just above the chordal

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nodule, which represents the future position of the true cords. It is of relatively large size in the newborn and it commences to regress at the age of 6 years (Negus, 1949). With increasing age the ratio between ventricle and saccule increases, until the parts have reached the adult state. The sacculus is therefore more obvious in early life, and tends to drop out of sight in the adult.

The sacculus appears to be the degenerated relics or else the incomplete precursors of air sacs leading out of the ventricle with a function concerned with re-breathing air. In the siamang, the orang-utan, and the chimpanzee these air sacs are fairly large. They extend down the neck through the thyro-hyoid membranes between the thyro-hyoid muscles and then spread out at the root of the neck. They may extend laterally beneath the sternomastoid muscles under the clavicle and may reach the axilla. When the human sacculus is compared with the enormous air sac of the orang-utan or the chimpanzee it can be seen that these developmental changes illustrate an evolutionary degeneration.

The ventricle of Morgagni can be defined as a pocket-like depression or recess the mouth of which is somewhat narrower than its cavity, and the laryngeal appendix as a diverticulum of mucous membrane, which ascends between the false cord and the ala of the thyroid cartilage, almost or actually reaching the upper border of the latter. Virchow described as developmental anomalies examples extending beyond this level, so that the apex of the saccule came to lie behind the thyro-hyoid membrane and on very rare occasions extending as high as the hyoid bone. Bartels (1905) found that in 25 per cent. of the fœtuses and newborn examined by him, the saccule extended above the level of the upper border of the thyroid cartilage, and he found it absent in 0·3 per cent. of the cases.

The upper wall of the ventricle is formed by the ventricular band, its floor by the lateral portion of the vocal cord and the thyro-arytenoid muscle, its lateral wall by the upper fibres of the thyro-arytenoid and the thyroid cartilage invested with its perichondrium.

The sacculus varies greatly in size and shape. It may be conical with its base below, at other times it is pear-shaped with its broader part above; occasionally it may be cylindrical. Generally it is curved upon itself. Its average size is half-an-inch in the vertical direction. The thyro-epiglottic and ary-epiglottic muscles, as they run into the ary-epiglottic fold surround the upper part of the saccule and act as the compressor laryngis as described by Hilton (1837). The saccule is invested with closely set mucous glands and lies in loose connective and adipose tissue. Hilton expressed the opinion, that the compressor sacculi laryngis, by its contraction, discharges the secretion of the sacculus on to the vocal cords, and thus lubricates them. He further described two crescentic folds of mucous membrane, placed anteriorly and posteriorly at the entrance into the ventricle, with their concave edges towards each

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other. These two folds are not at the same level, the anterior being slightly higher than the posterior. Hilton suggested that their purpose was to break the stream of fluid from the sac and permit of a general diffusion of its secretion over the surface of the vocal cords. The saccule is enclosed in a fibrous membrane or capsule, continuous below with the ventricular band, to which it is firmly attached in nearly its whole length, anteriorly to the edge of the epiglottis, and superiorly to the thyroid cartilage. Hilton suggested that this forms a suspensory ligament for the sac, and forms its chief anatomical safeguard against prolapse. The mouth of the saccule is situated in the anterior third of the roof of the ventricle, is of narrow oval shape and measures, in a well-developed larynx, about 8 mm. The shape of the mouth is said to vary according to the state of tension or relaxation of the cords. In the former case they are nearly oval, in the latter more circular.

The pouch of Morgagni and its upward extension, the sacculus, are covered with ciliated columnar epithelium. Lymphoid cells, singly and in islands, are scattered in the stroma. In the submucosa are numerous tubular glands, lined with mucus and serous cells. These glands empty their contents into the ventricle. The glands are surrounded by thin muscle fasciculi of the fibres constituting the compressor sacculi and are embedded in fat. In contradistinction, in the region of the true vocal cords, there are practically no glands and the whole submucosa consists of fibres of the thyro-arytenoid muscle, the innermost fibres of which are intimately connected to the fibro-elastic band, which is covered with stratified epithelium. The nerves to the saccule are derived from the superior laryngeal nerve and are distributed upon its entire circumference and to the glands upon it.

Diagnosis

Laryngoceles may appear at any age and have been reported in quite young children. They are seen within the larynx as a cystic swelling arising at the anterior end of the false cord, sometimes only widening the false cord and causing a funnel-shaped gaping of the ventricle, at other times forming a large globular swelling, which may fill the whole of one side of the ventricle and extend across to hide the other cord. Laryngoceles may be uni- or bi-lateral. In some cases, the cyst only enlarges on forced phonation, but in others it remains as a tense tumour, obstructing respiration. Externally, a tumour may be present lying mainly anterior to the sternomastoid muscle, but may extend into any part of the soft tissues of the neck, which may give way to the expanding pressure of the cyst. The size varies from a barely palpable nodule to a swelling reaching down as far as the clavicle or into the submaxillary region and even displacing the base of the tongue, part or whole of the larynx and trachea. The character of the tumour may vary from

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permanent and almost stony hardness to a fluctuant and reducible hernia-like swelling. The patient may be able to distend the tumour voluntarily by forced expiration or coughing.

Symptoms vary according to the size of the cyst. Alteration in size is common and therefore the symptomatology changes. It may be only the presence of a peculiar timbre, or an alteration in tone, or hoarseness, or a weakness, progressing to aphonia.

Difficulty of respiration may be marked, when the patient exerts himself, or, in more severe cases, may be present even with the patient at rest. One case is reported in which death occurred from respiratory obstruction. Bouts of coughing may be prominent, and dysphagia of some degree may be present. Pain is not a prominent feature, but Larrey explained the headache of which some of his patients complained as being due to chronic obstruction of the veins of the head.

In case of infection, a pyocele is formed with all the general and local manifestations of acute inflammation in addition to the above-mentioned clinical picture, but usually to a more marked degree.

Radiographic appearance of an air-containing tumour is striking, and examination of the soft tissues of the neck will show all the details of its structure and extent most clearly. In differential diagnosis a branchiogenic cyst and a cyst of the thyroglossal duct can be taken into consideration, but neither of these communicate with the larynx. In practice, however, the condition is not usually difficult to diagnose, since the position of the cyst and the well-known radiological appearance of air-containing cavities place the diagnosis beyond doubt.

CASE I.—J.W., a male patient, 48 years of age, a farmer by occupation, was seen at the E.N.T. Out-Patient Department of the Glasgow Royal Infirmary on March 3rd, 1950, complaining of a " lump " on the right side of the neck, associated with hoarseness, dyspnœa and slight dysphagia.

History. The patient had always been a healthy man until 1939, when he had a motor-car accident, involving the death of a pedestrian. After this unfortunate happening, he became very excitable and " highly strung ", and noticed in 1941 a swelling on both sides of the neck. He was admitted to the medical wards of the Infirmary in 1942, and a toxic goitre with enlargement of the thyroid was diagnosed. Seven weeks after his admission a thyroidectomy was performed. Apart from a stitch abscess he made an uninterrupted recovery. His general condition improved rapidly and he was very well until 1948, when a swelling appeared on the right side of the neck, which was hard, red, very painful and tender to touch, and he became very hoarse. His doctor referred him to a surgical unit, where treatment with penicillin, sulphonamides and hot fomentations was instituted. No surgical intervention was required, as " the swelling discharged inwardly by itself ". A great amount of mucoid yellowish fluid was brought up ; some of the fluid he swallowed, and this caused troublesome diarrhœa for a few days. The swelling disappeared. No definite diagnosis was made, and the patient was

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discharged. He was perfectly well for one month. After that time, he noticed a small swelling on the right side of the neck, which, apart from the deformity did not give him any trouble. He was referred to the surgeon, who had operated on his thyroid gland, because it was thought that the swelling had possibly some connection with the previous operation. The findings at that examination were such that it was decided to explore the swelling in the neck by operation. The patient was anæsthetized and an intratracheal tube was passed. When this was done, the swelling increased visibly, was tympanitic on percussion and it was clear, that it was an air-filled cyst. The intended operation was not carried out.

During the following two years, he managed to reduce the size of the swelling or make it completely disappear by pressure on it while keeping his mouth open. Once, while yawning, he heard the air escaping with a hissing sound, and the swelling disappeared completely. During strenuous work, the swelling always became more marked and he had to " empty " it three to four times a day. Whenever the swelling was present, he was hoarse and dyspnœic. These symptoms subsided with the disappearance of the swelling. Very often, when expressing the air he felt a salty taste, which lasted only a second or two. During these two years he did not consult his doctor.

Seven weeks prior to the examination at the E.N.T. Out-Patient Department, he had developed a severe cold. He had noticed that the swelling had enlarged considerably and that he was unable to reduce it on pressure. His voice became hoarse, he had dyspnœa, particularly on exertion, and the swelling became red, tender and painful. The patient consulted his doctor, who gave him penicillin, sulphonamides and a gargle. After intensive chemotherapeutic treatment, the swelling " burst inwardly " again and discharged thick, glairy, but clear fluid. The fluid had a salty taste and the swelling disappeared completely, and he was able to return to work.

After a week, however, the swelling reappeared, with all signs of an acute infection, as on the previous occasions. The same treatment as before was instituted, which again led to subsiding of the swelling and to a discharge of a purulent material " inwardly ". After a few days, however, the swelling reappeared, but during breakfast he heard a hissing sound and the swelling disappeared.

About one week prior to coming to the Department, he had a cold. Following this, he developed an irreducible swelling, associated with hoarseness, marked dyspnœa, and, for the first time dysphagia.

Examination. A healthy-looking man, high coloured. He speaks with a quiet husky voice, obviously only able to do so with great effort, and talking for some time produces severe dyspnœa. Slight exophthalmos. There is a scar on the neck originating from the thyroidectomy.

Neck. On the right side of the neck there was a swelling, about the size of a large orange. On coughing and shouting the tumour increased in size, but pressure on it did not diminish its size, giving the impression of a valvular type of occlusion. The skin over the tumour was normal and not adherent to it. The larynx and trachea were displaced to the left of the midline. On palpation, the tumour appeared to be smooth, lobulated, tense, and was not tender. The tumour moved on swallowing. On percussion it gave a tympanitic sound and

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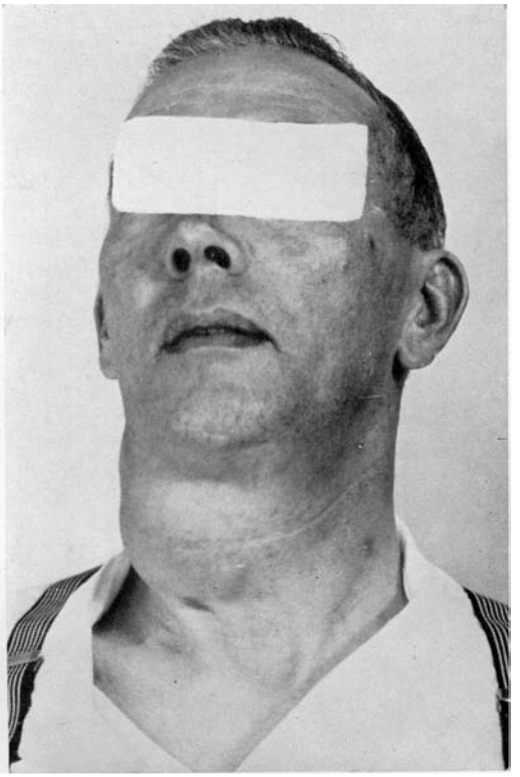


FIG. 1. CASE I.
Bilateral laryngoceles.

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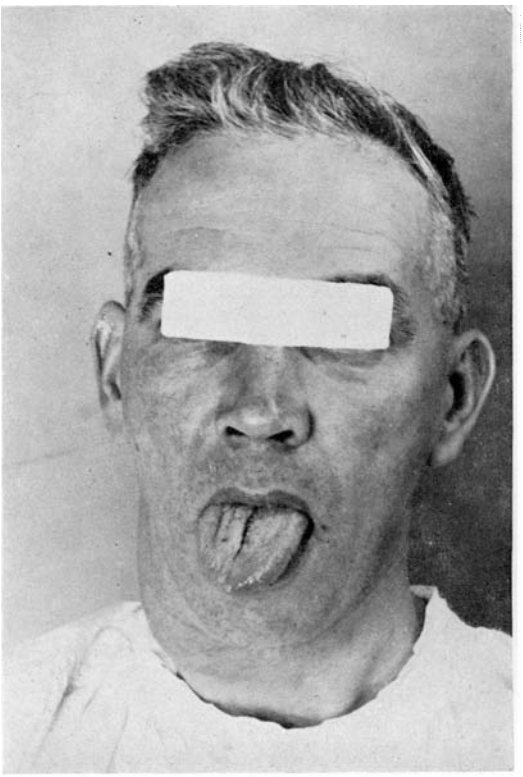


FIG. 2. CASE I.
Deviation of protruded tongue, due to displacement of its base.

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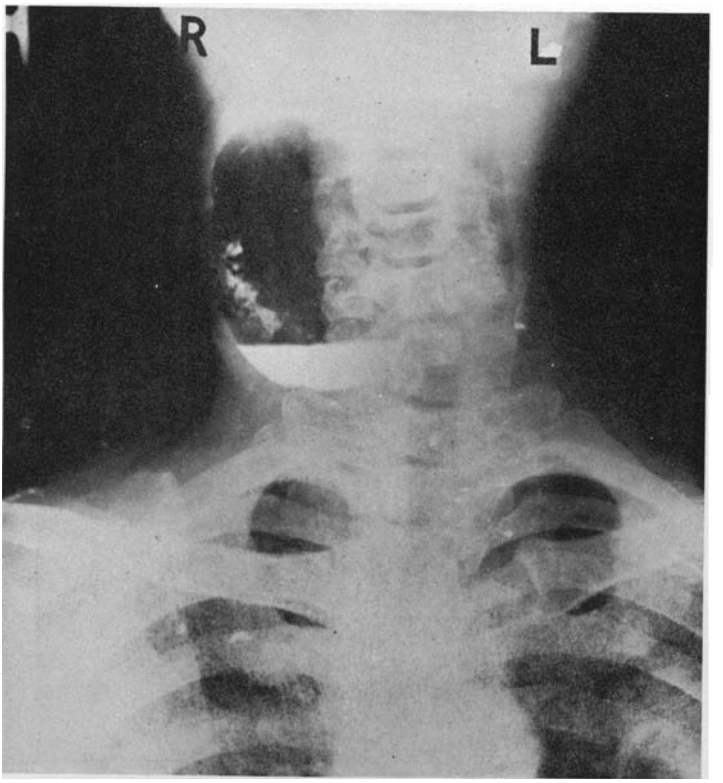


FIG. 3. CASE I.

Antero-posterior view of the laryngoceles after injection of contrast medium into the right air cyst.

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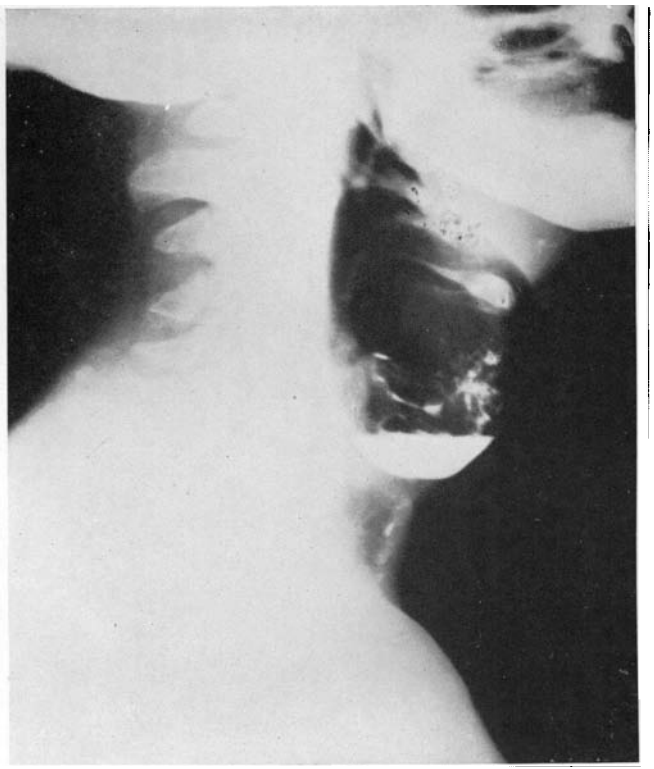


FIG. 4. CASE I.

Lateral view of laryngoceles, after injection of contrast medium into right air cyst.

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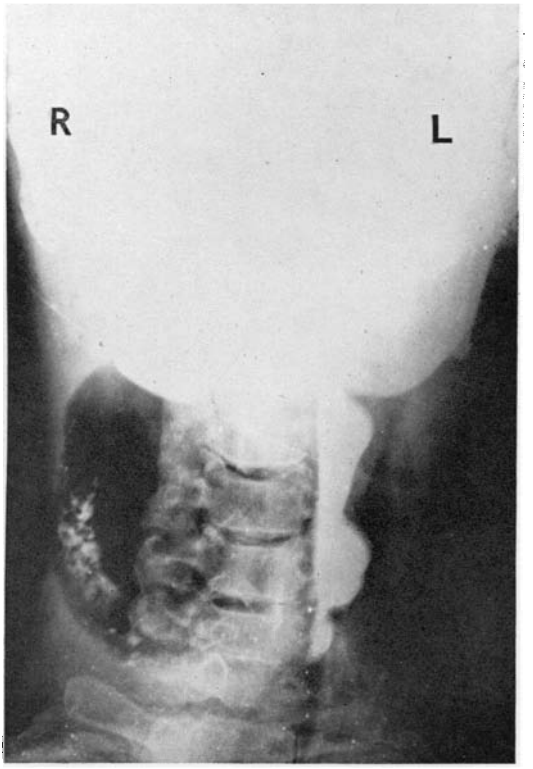


FIG. 5. CASE I.
Patient lying on his left side, after injection of contrast medium into right air cyst.

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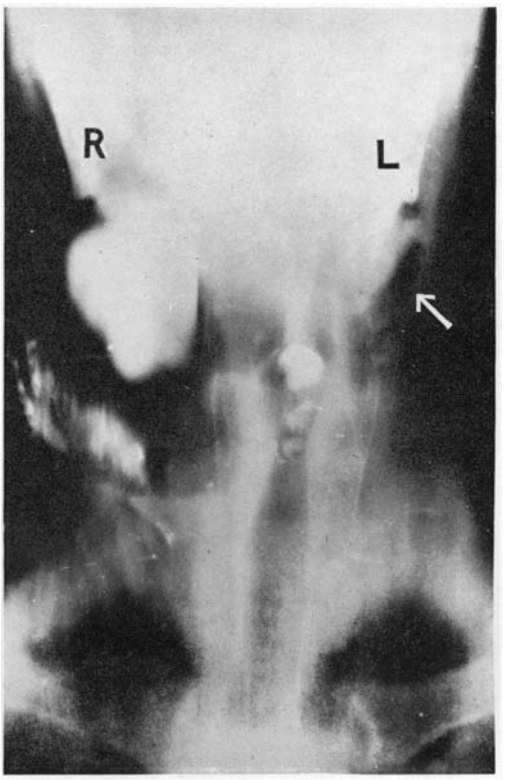


FIG. 6. CASE I.
Tomograph after injection of contrast medium into right air cyst.

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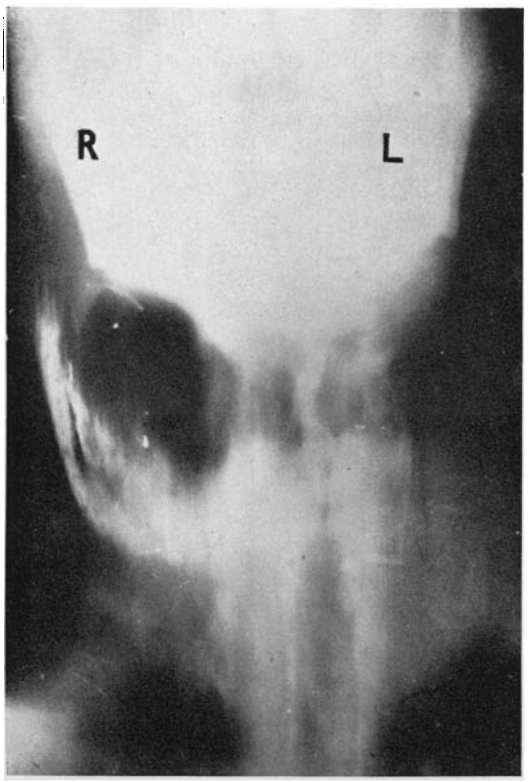


FIG. 7. CASE I.
Tomograph after injection of contrast medium into right air cyst.

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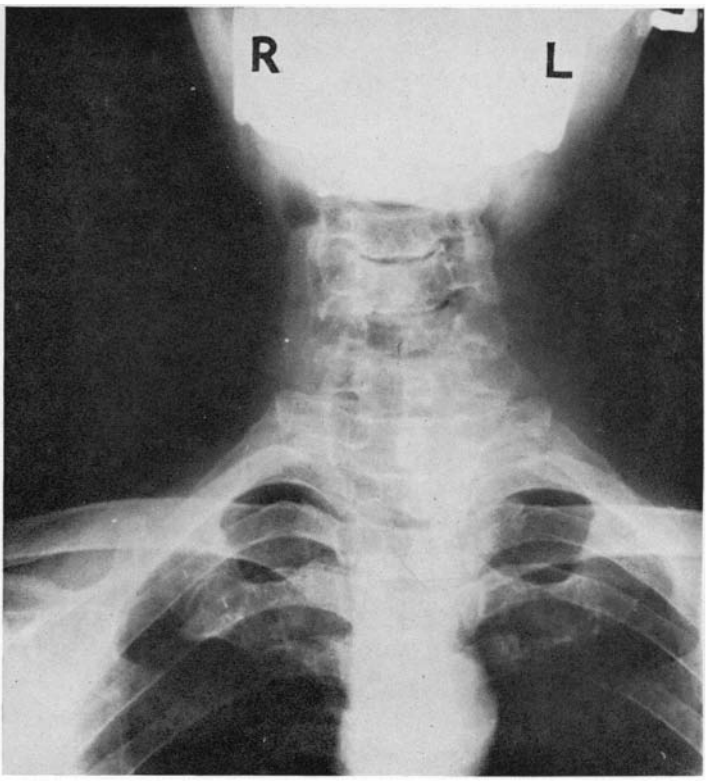


FIG. 8. CASE II.
Antero-posterior view of bilateral laryngoceles.

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it was clear on transillumination. Auscultation yielded no sound. In the left anterior triangle of the neck there appeared, on coughing, a swelling the size of a walnut (Fig. 1).

Laryngoscopy. The right pyriform fossa was filled by a bulging, smooth tumour, covered with inflamed mucous membrane, which was tense to touch. The right edge of the epiglottis was rolled inwardly and the larynx pushed over to the left of the midline. The whole of the right and almost the whole of the left cord were hidden by the tumour, almost completely hiding the glottic aperture. The base of the tongue was displaced to the left, so that the protruding tongue pointed with its apex to the right (Fig. 2).

The remaining E.N.T. examination revealed no abnormality.

W.R. negative. B.P.140/50.

Examination of the blood and other systems showed nothing abnormal.

A radiographic examination was carried out : chest, negative.

The patient's neck was X-rayed both before and after the injection of lipiodol. Straight X-rays and tomographs were taken. For the lipiodol examination, a needle was inserted through the skin over the tumour, and air was heard to escape through the puncture hole. 10 c.cm. of contrast fluid were injected.

X-ray Report. " A loculated aerocele is well defined both before and after lipiodol injection on the right side of the neck. There appears to be a smaller air cyst on the left side. Tomographs define a large air-containing cyst in the soft tissues of the right side of the neck, and this appears to communicate through a defect in the right thyro-hyoid membrane with an intralaryngeal portion, which is bounded medially by a midline septum. The laryngeal portion of the air sac appears to correspond to a dilated saccule and it is evident that a similar condition is present on the left side, but the extension into the soft tissues of the neck is very much less marked. The right aerocele extends beyond the midline, as can be seen by the presence of lipiodol on the left on the film, which was taken with the patient lying on his left side. The right thyroid lamina appears to be smaller and less developed than the left (Figs. 3-7).

After puncture of the cyst for the purpose of inserting lipiodol, the patient developed a subcutaneous emphysema involving neck, chest and face, due to the escape of air from the puncture hole. The emphysema disappeared within three days and the patient had no ill effects.

In order to see the relation of that part of the aerocele, which extended apparently behind the larynx, a barium swallow was given to the patient four days after the previous X-ray examination. However, the lipiodol seemed to have re-established the communication of the air cyst with the laryngeal cavity, which might have been occluded previously by œdema or by an impacted mucus plug at the orifice, the result of the upper respiratory infection ; and at the time of carrying out the barium swallow, the swelling had almost completely subsided. On this examination the aryepiglottic ligament appeared to be stretched, but no abnormality was seen in the retrolaryngeal space. The alignment of the cervical œsophagus was within normal limits. The larynx and trachea were displaced to the left.

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Had this examination been carried out at the time of maximal tension within the laryngocele, its extension behind the larynx might have been seen by widening of the retrolaryngeal space.

The diagnosis of a bilateral laryngocele was made. The right-sided air cyst had been the seat of previous mucoceles and pyoceles. The left-sided one was much smaller and only visible on coughing.

The patient did not agree to the proposed excision of the sac, as he " preferred to have the swelling, than to take a chance at operation ".

The patient was seen repeatedly as an out-patient, and he was very well. When he was at rest, there was only a slight asymmetry of the neck to be seen, but on prolonged speaking or coughing, a soft, easily reducible swelling appeared.

On laryngoscopic examination, only a slight bulge was present in the right pyriform fossa, the epiglottis was normal in appearance, and the larynx was only slightly displaced to the left. The right false cord showed fullness. Both true cords were normal in appearance and movement. The base of the tongue was still displaced to the left, but to a lesser degree. His voice was only slightly husky.

At the last examination, however, there was a cord-like thickening on the right side of the neck, in front of the right ala of the thyroid cartilage and thyro-hyoid membrane. The thickened tissue was firm to touch, quite mobile and painless. It was assumed that this was the sac or part of it, which had undergone fibrosis and shrinkage. On laryngoscopic examination, there was only slight fullness of the right false cord.

In spite of two attacks of " flu ", he had no complaints, and there was no re-appearance of the swelling in the neck. On previous similar infections of the respiratory tract, he had developed a large, irreducible swelling in the neck.

It appears that the laryngocele had undergone a spontaneous cure, the improvement and diminution in the size of the sac commencing from the time when the contrast medium was injected into the laryngocele. It is possible that iodine containing fluid had a therapeutic value in this case.

CASE II.—J.S., a male patient, 57 years of age, lithographer by occupation and in his spare time a choir conductor, presented himself at the Surgical Out-Patients Department of Glasgow Royal Infirmary on November 7th, 1949, because he had noticed a swelling on the left side of the neck seven weeks previously. The swelling became larger on coughing and stooping, but he did not complain of hoarseness, dyspnœa or dysphagia. There were no signs of thyroid dysfunction and he had not lost any weight. There was nothing of importance in his previous history.

Examination. A healthy-looking man, who speaks with a normal voice.

Neck. The neck shows asymmetry, produced by a swelling on the left side of the neck, situated in the anterior triangle. The larynx and trachea are displaced to the right. The skin over the swelling is normal, and not adherent.

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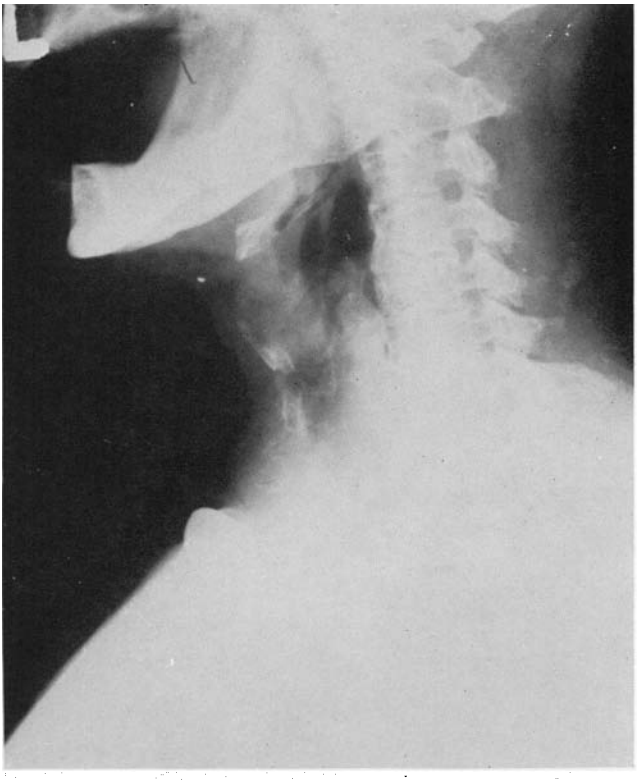


Fig. 9. Case II.
Lateral view of bilateral laryngoceles.

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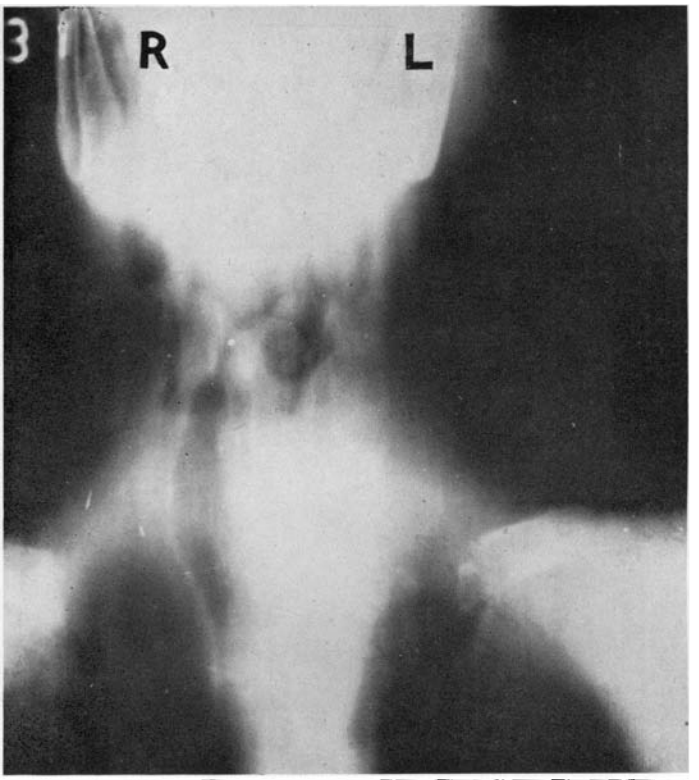


FIG. 10. CASE II.
Tomograph of bilateral laryngoceles.

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On palpation the tumour has the size of a walnut, is situated partly in front of the sternomastoid and is partly covered by it at the level of its middle third. The swelling increases to about four times its size on coughing or straining. The surface is smooth and soft to touch and moves on swallowing. Percussion produces a tympanitic note and the tumour is easily transilluminated. Auscultation does not yield any sound. The appearances on the right side of the neck are normal, when the patient is at rest, but on coughing and straining there appears a swelling, the size of a walnut. On palpation, one has the impression of feeling a thickening of the tissue in front of the sternomastoid muscle at the level of its middle third.

Laryngoscopy. There was "fullness" of both false cords, but this was far more marked on the left side. The larynx was displaced to the right of the midline. The appearance and mobility of the true cords were normal.

The remainder of the ear, nose and throat examination revealed no abnormality.

W.R. negative. B.P. 150/100.

Examination of the blood and other systems showed nothing abnormal.

Radiography. "The straight X-rays and tomographs define on each side of the neck an aerocele. They have their openings into the upper part of the pyriform sinuses. On the left side, the opening is wide and there would appear to be an abnormality of the thyroid cartilage posteriorly causing a larger air shadow in the pyriform sinus. On the right side the appearances of the pyriform sinus are more normal" (Figs. 8-10).

The barium swallow which was carried out showed the typical features of displacement of larynx and trachea to the right. The mobility of the trachea was not restricted. There was no abnormality of the œsophagus.

The diagnosis of bilateral laryngocele was made, the one on the left side being the larger one. No treatment appeared to be indicated.

The patient, who was seen frequently, for re-examination, was well, and there was no obvious increase in the size of the laryngoceles.

Discussion and Comment

A laryngocele can be defined as an air-containing cyst, which arises from and communicates with the cavity of the larynx. Laryngoceles are described according to the position in which the sac develops. When contained entirely within the limits of the larynx it is termed "internal laryngocele", but when in addition, it extends beyond the larynx, it becomes an "external laryngocele". Air cysts may be unilateral or bilateral. Such bilateral occurrence in man does not lead to fusion across the midline anteriorly, as occurs in the cysts seen in the necks of apes.

The laryngoceles could be divided into two groups: the primary, or congenital, and the secondary or symptomatic laryngoceles. The congenital air sacs again may be divided into those which are primary

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intralaryngeal, forming a congenitally preformed sac, which may become extralaryngeal by penetrating the thyro-hyoid membrane, and those which are primary extralaryngeal herniae, homologous to the air sacs found in anthropoid apes. The enlargement and extension in both types occur by increased intralaryngeal pressure.

The symptomatic or secondary type arises as the result of an underlying disease. Chronic catarrh and ulceration of the respiratory tract, tuberculosis and syphilis are the commonest conditions. They involve the ventricle and lead to partial closure of the entrance to the ventricle, possibly with valve formation, so that the ventricle is blown up with each inflation, such as occurs in phonation, excessive blowing and coughing, and thus gradually becomes enlarged.

The thyro-hyoid membrane is strengthened in the median line and at each lateral boundary to form the medial and lateral thyro-hyoid ligaments respectively, but between these it is poorly developed, and it may in part be deficient. The entrance of the superior laryngeal vessels and nerves through this space on either side further weakens an already weak structure. At times, however, it seems that the dehiscence between the edges of the middle and inferior constrictor muscles is the point through which the enlarging laryngocele passes. If the saccule becomes distended with air, there is in either case little anatomical hindrance to its presentation into the anterior triangle of the neck around the posterior border of the infrahyoid muscles. In most cases cited in the literature, an immediate factor has been sought and found, a factor which would cause distension of the saccule by an abnormal increase in the intralaryngeal air pressure. Pertussis in childhood, severe croup with coughing, straining during childbirth, extreme muscular effort, excessive use of voice, effort of vomiting, playing of musical wind instruments and glass-blowing have been thought to be responsible for the establishment of air cysts.

It would appear then that the appearance of a laryngocele depends on the following conditions : that an abnormally developed saccule becomes distended by increased air pressure in the larynx ; that by this pressure it may be protruded beyond the confines of the larynx, and that œdema of the mouth of the saccule may be responsible for its maintenance or further enlargement.

The two cases described had bilateral external laryngoceles. In each case the laryngoceles were of unequal size. The bilateral presence is in favour of a congenital origin. An interesting point is, that the larger of the two laryngoceles in each case was on the side where the lamina of the thyroid cartilage was less well developed. This may be explained in one of two ways : either that there is a primary defect in the formation of the cartilage, facilitating a primary external laryngocele, or that a primary extralaryngeal sac prevents the full development of the thyroid cartilage.

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Although no obvious direct connection between the thyroid operation eight years prior to the appearance of the laryngoceles can be assumed, one is tempted to associate these two conditions in some way. They were definitely not noticed at the time of operation, but it would be possible to explain it on the hypothesis that the operation led to interference with the blood supply to the thyro-hyoid membrane, or to some traumatic lesion of this membrane itself, which further weakened the already poorly developed thyro-hyoid membrane and thus offered less resistance to the enlarging sacculus. Another possibility is that the first infection of the slightly dilated saccule, leading to a pyocele, weakened not only the wall of the sac, but also the adjacent thyro-hyoid membrane, thus leading to a distension of the sac and transgression through the weakened membrane. None of the previously mentioned causes, producing increased intra-laryngeal pressure, could be found in the first patient, but again the infection of the wall of the congenitally preformed sac might be a possible explanation for its gross expansion. The right-sided laryngocele was the seat of recurring mucus retention cysts, and on several occasions the contents have become infected, thus forming pyoceles.

Mucoceles must have resulted from occlusion of the ostium of the laryngoceles into the ventricle, either by œdema of the mucous membrane, or valvular action of the œdematous crescentic folds or possibly by an occluding mucus plug. The formation of a retention cyst was frequently in consequence to an infection of the respiratory tract, the infection producing œdema at the orifice. Once the œdema had subsided or the plug had been dislodged, the contents were evacuated and were replaced by air. The salty taste, experienced occasionally by the first patient, is probably due to a " spilling over " of the secretion of the sac, which is constantly produced by the numerous glands, considering the large secreting surface of the laryngocele.

Each time the patient developed a pyocele, it responded well to the chemotherapy, probably by reducing the inflammatory œdema at the ostium of the crescentic folds. There seems to be no tendency for the pyocele to discharge on the skin surface. This is probably due to the fact that there is less resistance for its discharge through the ostium within the larynx.

In the second case, the patient was quite definite in his statement that the presence of the tumours was only of several weeks' duration. Whether he had not noticed them or whether they had enlarged suddenly for some reason is impossible to say. It can be assumed, however, that the bilateral sacs were of a congenital nature, which have become manifest by excessive use of his voice, the patient being a choir conductor. The under-development of one of the thyroid laminae is also in favour of a congenital development.

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Summary

A few historical data, the embryology and anatomy, relating to Morgagni's ventricle and the sacculus are discussed.

Two cases of bilateral laryngoceles are described in detail. In one of the patients, the laryngocele had assumed unusually wide extension, and no similar case with such extension could be found in the literature.

This enormous sac was repeatedly the seat of mucus retention and infection. The pyoceles responded each time to intensive chemotherapeutic treatment, by discharging their contents through the ventricular ostium into the larynx. Eventually the sac underwent fibrosis and thus effected a spontaneous cure. It is thought that the injection of iodine-containing fluid influenced the progress of the disease beneficially. The second patient only showed some asymmetry of the neck, but had no complaints, and it was assumed that the distension was due to excessive use of his voice as a choir conductor.

It is suggested that in both patients the laryngoceles had developed on a congenital basis.

A classification of laryngoceles is suggested.

X-ray photographs before and after lipiodol injection are shown.

I am indebted to Mr. Stephen Young, for his constructive criticism, to Mr. George Mowat for allowing me to see the case records of the second patient, and to Dr. J. Z. Walker for carrying out the X-ray examination.

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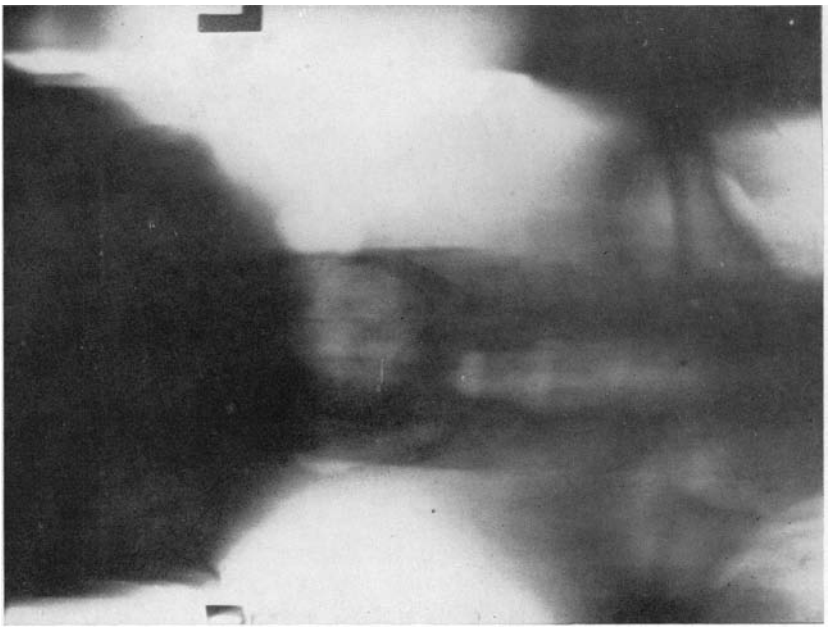


Fig. 2. After excision.

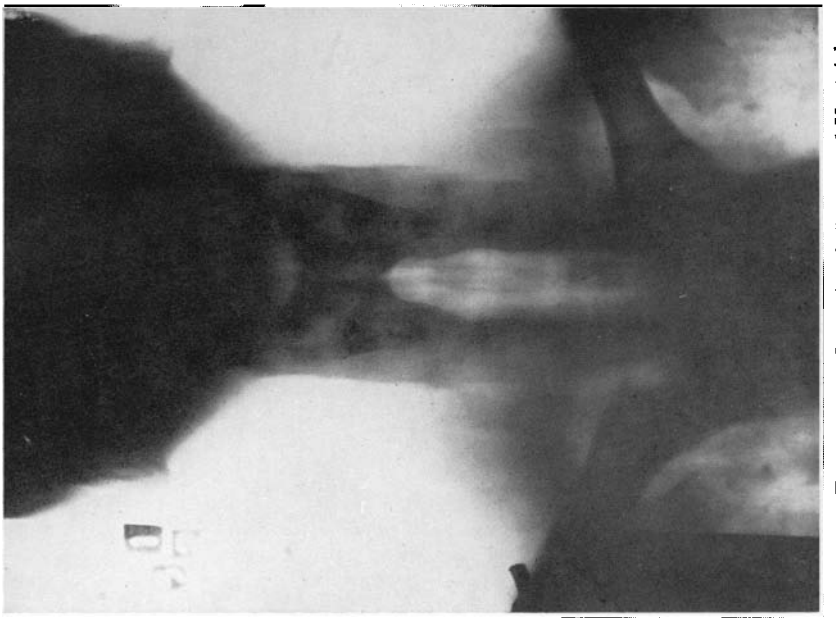


Fig. 1. Tomogram. Cyst of Left Laryngeal Ventricle.

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