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The laryngeal subglottis*

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IT is an honour and a privilege to be invited to give the Sir William Wilde Discourse to the Irish Otolaryngological Society.

It is my impression that Ireland is the birthplace of an extraordinary number of great men, past and present. To be your guest and to present the Sir William Wilde Discourse was not a task to be taken lightly. My excuse for acceptance lies in the words of one of your great minds:

'Tis an old maxim in the schools
That flattery is the food of fools,
Yet now and then your man of wit,
Will condescend to take a bit.'

I must admit I was indeed flattered and so am here to talk to you about a laryngeal problem of great interest to me

In preparation, I turned to the work of another of your great men, with which I am sure you are all familiar, 'The Victorian Doctor', which reveals the life of Sir William Wilde against the background of the Ireland of his day. It is a remarkably capable description of a remarkable man. My courage failed me rapidly in consideration of the abilities and breadth of interest of the man to whom this Discourse is dedicated. If Sir William were here he could speak to you not only of medicine but also, as a famous traveller and author of books of the near and far east, he could fascinate you with stories of Egypt and the Holy Land; he could instruct you as a geologist in the heritage of this beautiful island, and as a doctor, he could speak with authority of the general field of surgery and even of those special fields of ophthalmology and obstetrics. He was fortunate

* Sir William Wilde Discourse.

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also in his associates. He would have stories to tell of some of the great men in medicine with whom he rubbed shoulders daily. The names of Graves, Stokes, and Colles are familiar to medical students the world over. How remarkable that such a collection of talent should inhabit a single city at one time.

My only defence for my very narrow subject and my limited abilities lies in the general one, that the field of knowledge in medicine has exploded so rapidly since Wilde's days in Dublin, that we are all perforce victims of super-specialization. The specialty of laryngology had not even had its beginnings when Sir William devised new methods of directing light into the external ear canal. Later in his career when the larynx indeed became visible to the viewer, the first great impetus for knowledge had passed him by or perhaps it is more accurate to say that not even he could properly digest more than had already been consumed. Had the birth of laryngology been a few years earlier, I am sure Wilde would have seized upon it with his usual great energy as he constantly undertook the study of medical areas where new knowledge and extra application of energy were needed.

Perhaps the only association of Sir William Wilde and the laryngeal subglottis was the justifiably famous case of his emergency tracheotomy performed in a small child with a laryngeal foreign body. We are not told, but I believe the possibilities are good that the trachea was entered through the crico-thyroid membrane. Survivors from tracheotomies were not sufficient in numbers those days to bring attention to the late complications of such a high entrance to the trachea.

Lacking the genius of Wilde I may, however, benefit from my refresher course into the life of a great man and attempt to emulate his motives which he outlines in the preface of his book on Aural Surgery as follows:

> 'I have laboured and I trust, not in vain, to expose error and establish truth; to lay down the just principles for an accurate diagnosis of the diseases (of the ear); to rescue their treatment from empiricism, and found it upon the well-established laws of modern pathology, practical surgery, and reasonable therapeutics.'

The laryngeal subglottis is a region which, until recent years has not attracted the attention of surgeons. It was rarely the site of malignancy, and although congenital cysts and stenoses were well recognized, effective treatment was another matter. The age of violence in which we all live has brought this area more frequently to our attention. The automobile and particularly, recently, the snowmobile and other similar devices are responsible for damage to the larynx and the laryngotracheal complex with increasing frequency. Similarly, the advances in techniques to assist the respiration of very seriously ill patients have taken their toll of damage to the larynx and trachea. The subglottis is injured very frequently under these circumstances and much more commonly than the larynx.

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The laryngeal subglottis

Long-term tracheotomy in children, which has traditionally been considered to be the appropriate management for subglottic stenosis, has been shown recently to carry a significant mortality. New surgical techniques are being devised to deal with this problem and avoid the risk of sending the small child home with his tracheotomy.

Carcinoma and other malignant diseases of the subglottis are rare, but we have become aware of the lethal nature of malignancy of this site. Moreover, carcinoma of the subglottis behaves differently and requires different management from that of the larynx.

I propose, therefore, to spend some time in the description of the anatomy of the subglottic region and the classification of malignant disease in this site. We will discuss later the nature and management of the common affliction in the area in the hope that you will recognize and appreciate these conditions in your own patients.

The laryngeal subglottis is contained by the cricoid cartilage and the conus elasticus. It is bounded below by the inferior margin of the cricoid cartilage and above by the insertion of the fibres of the elastic lamina into the vocal cord (Fig. 1). Anteriorly, the elastic lamina is well defined and visible, posteriorly, it is small and scanty as it inserts into the vocal

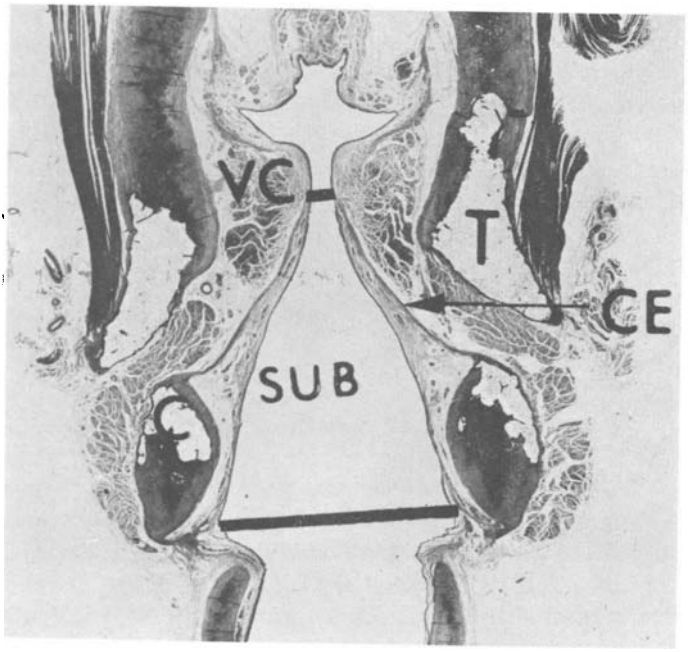


FIG. 1.

Anatomical demonstration of the subglottis.
VC = vocal cord; T = thyroid; CE = conus elasticus; SUB = subglottis.

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process of the arytenoid cartilages (Fig. 2). The vocal cords have a depth of 5 mm. This is demonstrable by radiography as well as clinically. At the anterior extremity of the cords their depth diminishes to 1 mm. or less and their common tendon inserts into the thyroid cartilage to form the anterior commissure. Thus, the area of transition from glottis to subglottis is very short indeed anteriorly and a tumour of the vocal cord which crosses the anterior commissure must inevitably involve the subglottis. The posterior commissure is the space between the two vocal processes of the arytenoids and is presumably also 5 mm. in depth. The

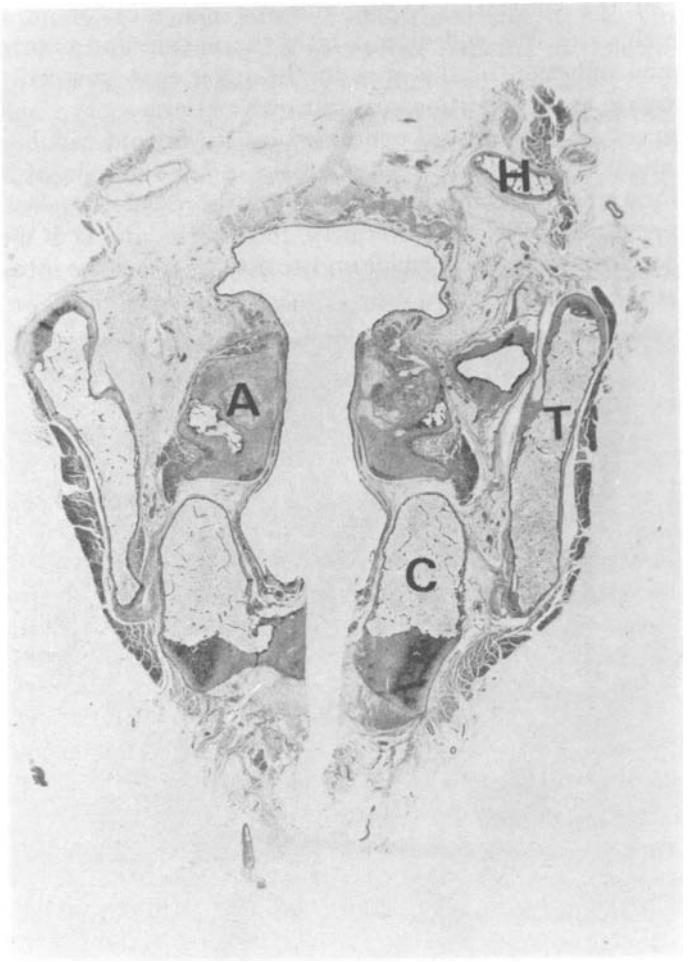


FIG. 2.

Posterior coronal section demonstrating the anatomical variations in the posterior position of the larynx.

H = hypopharynx; A = arytenoid; C = cricoid cartilage; T = thyroid.

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inferior margins of the vocal processes and the posterior commissure are the superior boundaries of the subglottis posteriorly and these are difficult to define by any method of examination.

There is a fixed and a mobile portion of the subglottis where the mucosa overlies the conus elasticus and the cricoid cartilage respectively. The elastic laminae fuse anteriorly to form the cricothyroid membrane which is also an immobile area. Posteriorly, the conus elasticus disappears as the vocal processes of the arytenoids are reached. The vascular pattern of the vocal cords is linear in an anterior posterior direction. In the subglottis anteriorly, this pattern rapidly changes and becomes circumferential. The cricothyroid membrane is pierced by branches of the superior thyroid artery and is rich with mucous glands. Here is a hiatus in the barrier to tumour spread from the larynx.

The anatomy of the subglottis is such that spread of malignant tumours beyond its boundaries is easily accomplished through the cricothyroid membrane anteriorly and laterally, and into the hypopharynx posteriorly. Perhaps, the only significant classification of these tumours would be to define whether they are confined to the subglottis or whether they have already escaped. This determination is not easy and requires all the diagnostic aids we possess.

In the management of traumatic injury when resection of the subglottis is the treatment of choice, the relation of the cricothyroid articulation becomes of great importance. It is intimately related to the recurrent laryngeal nerve and its integrity is necessary to maintain the stability of the larynx and the anterior projection of the vocal cord. The extent of the subglottic resection possible, is therefore limited by this landmark posteriorly and by the anterior commissure of the glottis anteriorly. (Fig. 3.)

It is well understood also that the cartilaginous circle of the cricoid ring increases the possibility of damage to mucous lining when exposed to the pressure of a cuffed endotracheal tube, used to assist in respiration.

Thus in many ways, the knowledge of the peculiar and somewhat complicated anatomy of the subglottis is of great importance if we are rationally to classify and treat diseases in this area.

Subglottic stenosis

The commonest challenge to the surgeon today in the area of the subglottis is the correction of chronic subglottic stenosis. Not only is this the commonest problem with which we have to deal, but it is also an area in which the successful surgical management is fantastically difficult requiring ingenuity, patience and great co-operation between the surgeon and the patient.

Direct trauma to the larynx, in automobile and snowmobile accidents, rarely fractures the cricoid cartilage unless the laryngeal framework is

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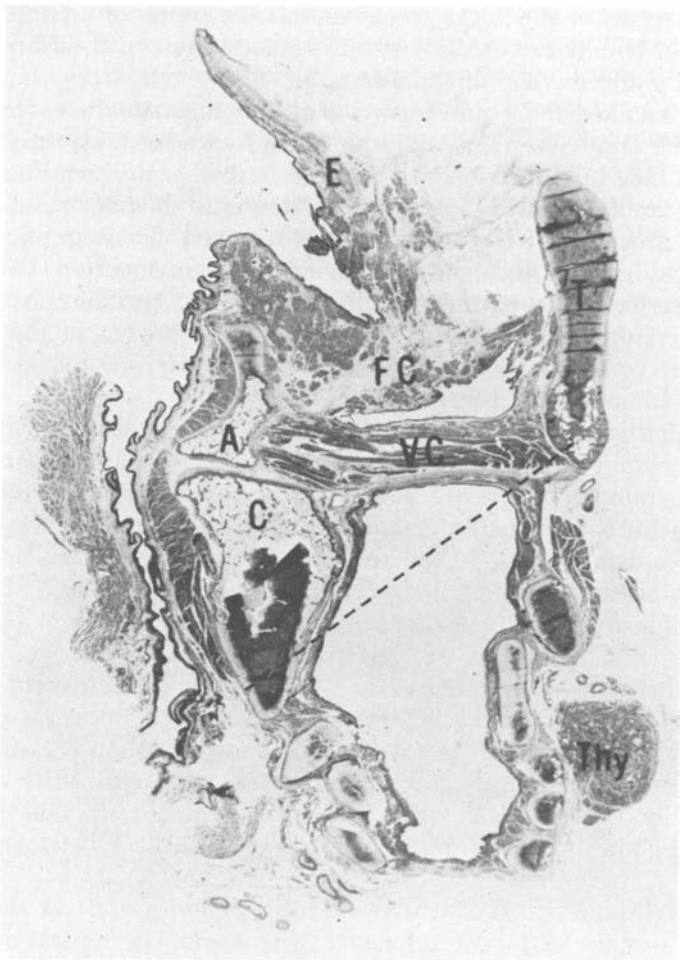


FIG. 3.

Sagittal laryngeal section to demonstrate the superior limit of excision for subglottic stenosis.

E = epiglottis; T = thyroid; A = arytenoid; C = cricoid cartilage; FC = false cord; VC = vocal cord.

also fractured. The commonest injury affecting the trachea and the laryngeal subglottis is separation of the trachea from the cricoid ring due to extreme force acting in an upwards and backwards manner. In the simple injuries of this type, separation alone occurs but in the more complicated and extreme injuries, the cricoid cartilage may be fractured or there may be associated fractures of the laryngeal framework. In addition, there are usually general injuries and multiple fractures to the patient which will inevitably delay appropriate primary treatment of the laryngotracheal injury.

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It has always been of great interest to me that a patient can have a separation of the cricoid and trachea and still survive the injury. We have seen patients who have had this complete separation and have not developed severe stridor for almost 24 hours. If such an injury is suspected and the patient's condition warrants it, the management of the acute injury is of course exploration of the area with re-anastomosis of the trachea to the cricoid and the re-establishment of the normal cricoid structure if it is fractured. Except in the cases of the very complicated laryngo-tracheal fractures, this early management will usually solve the problem. Unfortunately, such early correction is not usually possible, because of the other injuries from which the patient suffers. It is realized later that a significant stenosis exists in the subglottic area, when attempts to extubate the patient are unsatisfactory.

Injury to the laryngotracheal complex and the subglottis occurs also from the use of endotracheal tubes with a cuff for the assistance of respiration by positive pressure methods. The larynx is usually spared in these cases but the laryngeal subglottis is involved equally with the area of the tracheotomy stoma and the tracheal wall at the level of the cuff of the tracheotomy tube. In these cases, the management of acute conditions does not apply as once necrosis of cartilage due to the pressure of the cuff has occurred, the result is gradual but inevitable stenosis, regardless of efforts to prevent it. In fact, the use of steroids in this field seems merely to accentuate the eventual degree of stenosis. Our present efforts in the prevention of this injury relate to the use of specially-designed tracheotomy tubes, cuffs and connections with the respiratory machine. Great efforts have also been expended on the control of nursing care and the regular release of the pressure cuff. Despite all these things, however, although we have a reduction in the number of injuries to the laryngeal subglottis from cuffed tubes, we still see many serious cases every year.

The problem of diagnosis, assessment and management of chronic subglottic stenosis, whether the result of direct trauma or from indwelling tubes and cuffs, is the same. Aside from the usual clinical methods of examination, the most useful diagnostic procedure is radiological, and I think the use of contrast media laryngography is perhaps the most important of these. Tomography also has its uses and both these methods of radiologic examination should be carried out in each case. Endoscopy may not be as useful, as it may be difficult or impossible to pass the bronchoscope through the larynx into the trachea to assess the length of the stricture.

It is one of the challenging problems of this type of injury that the accurate assessment of the site and extent of the stenosis is most difficult. This is surprising as you would think that with laryngograpy and tracheography, we would have no problem. It has been our experience, however,

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that almost inevitably we are surprised by the size or extent of the tumour when we eventually open the larynx and trachea, and usually we find the stenosis at a much higher level than we anticipated.

There are, of course, variations in the extent of the injury to the laryngotracheal complex, and in the minor cases excision of the scar with stenting and grafting may be adequate. Such a case may be illustrated by a school teacher, who had previously been exposed to a cervical injury. Following this injury, he noted gradual stridor on effort, although his voice remained good. As a he was a young man, it was felt that his degree of disability related to his stridor was sufficient to warrant definitive treatment. His laryngogram showed a lesion which appeared to be well below the vocal cords (Fig. 4), and it was felt that this might be readily excised. On exposure, however, he was found to have a stenotic lesion involving the lower portion of the posterior plate of the cricoid and the lateral wall. It was decided, that because of the limited extent of the stenosis, the scar could be excised and a stent placed into the larynx for three weeks.

I mention, however, one danger in this regard. I have noted that following such stenting a degree of scarring persists which may in fact limit the motion of the vocal cords. We were concerned in his case as his voice was most important because of his responsibilities as a school teacher. The stent was removed at the end of three weeks and the result was an improvement in his airway which, although not perfect, was very much appreciated by the patient and enabled him to carry out his normal activities. His vocal cords are somewhat sluggish in motion, but fortunately his voice and airway have remained adequate.

Much more commonly, the extent of the damage in the subglottic area makes management by stenting and grafting impossible. The appropriate treatment for these significant strictures, which usually involve the cricoid cartilage and first tracheal ring is by excision of the stenosed area and direct anastomosis of the trachea to the posterior cricoid plate and the thyroid cartilage. It is in these cases particularly, that the definition of the extent of the stenosed area is most important. However, laryngography is very often confusing and the exact area of the stenosis can only be determined by direct examination. The laryngotracheal complex should be exposed and, by filleting the trachea and subglottis, the exact level and extent of the lesion can be determined (Fig. 5). It is probably wise to make the first incision into the trachea or subglottis at a point at which there is apparent stricture. Ths subsequent incisions proximal and distal to this point, will delineate the extent of the stenosis without sacrificing the normal tissue and will reduce the extent of the excision to a minimum. The stenosed area can then be opened by a vertical incision and directly inspected (Fig. 6).

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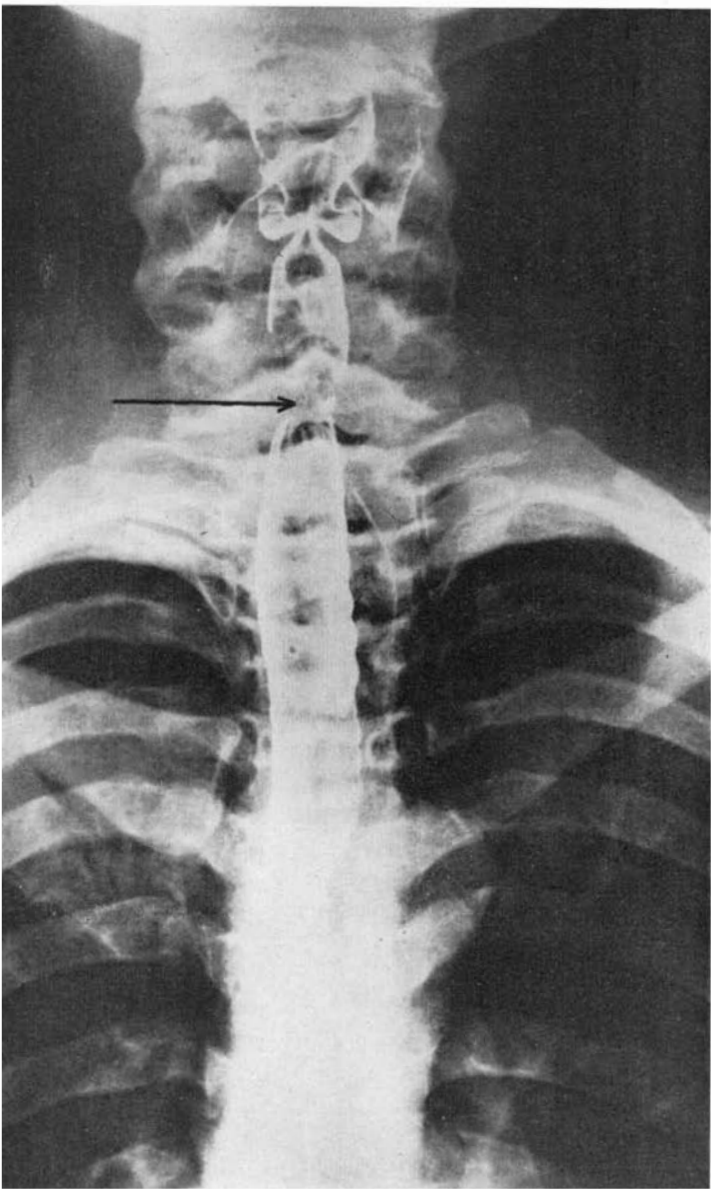


FIG. 4.
A contrast laryngogram demonstrating subglottic stenosis at the line of the arrow.

The problem of this scar excision is tremendously complicated if the vocal cords are mobile prior to the surgical procedure. Although subsequent vocal paralysis can be corrected by arytenoidectomy, this adds

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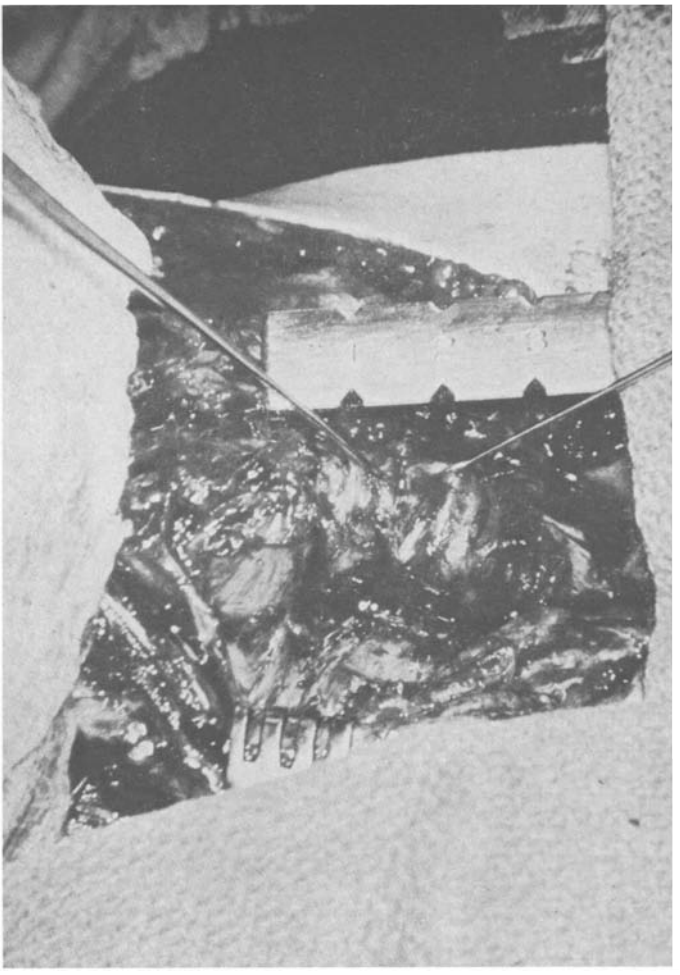


FIG. 5.

An operative picture to demonstrate the first incision into the trachea at the site of stenosis which is being demonstrated by the skin hook retractors.

a further complication to this difficult surgical procedure and should be avoided if possible.

The surgeon must make every effort to protect the recurrent laryngeal nerves. The nerve must be picked up distally, identified and traced to its entry into the larynx behind the crico-thyroid joint. This is best done by identifying the nerve in relation to the inferior thyroid artery where it passes behind, between or in front of the branches. It is then not difficult to trace the nerve as far proximally as possible and to leave it fully exposed so that it can be protected in the subsequent surgery (Fig. 7). The extent of the excision of the subglottic stenosis is limited

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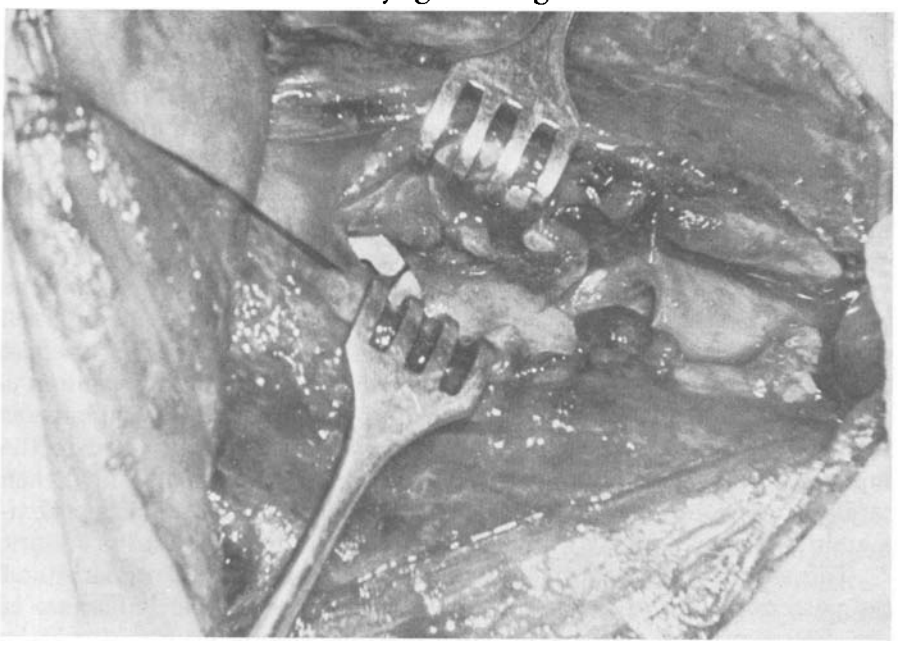


FIG. 6.
The stenosed area in the subglottis has been opened by a vertical incision and is demonstrated by the retractors. This allows direct inspection of the stenosed area.

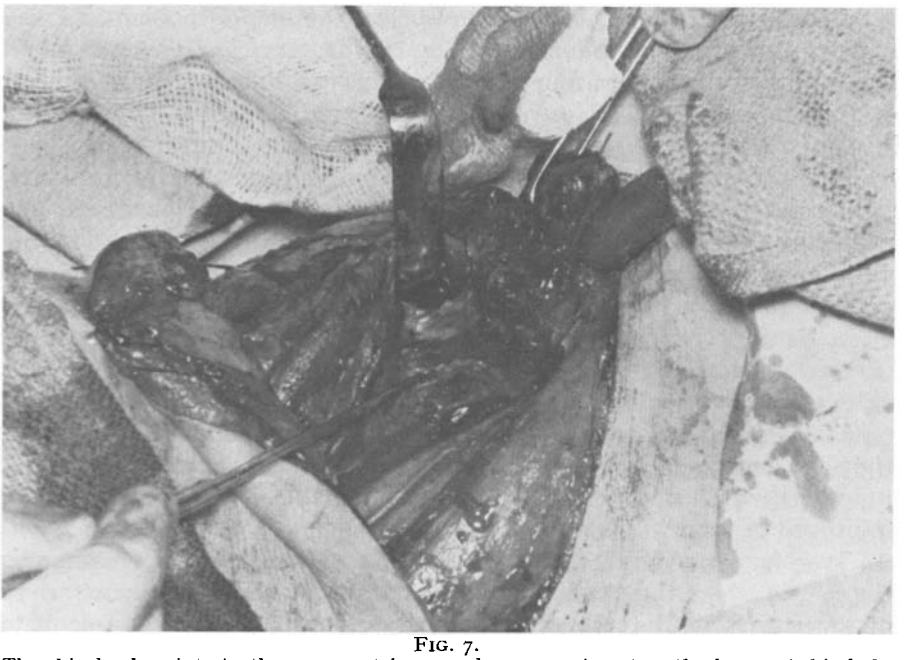


FIG. 7.
The skin hook points to the recurrent laryngeal nerve as it enters the larynx behind the crico-thyroid joint; thus the nerve is protected and the superior limit of the excision defined.

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by the crico-thyroid joint posteriorly and superiorly, and by the anterior commissure of the larynx anteriorly. Even in those cases in which the recurrent nerve need not be protected, and this is usually the case in traumatic injuries, it is not wise to excise the crico-thyroid joint as this will reduce the stability of the larynx.

With the joint and nerve exposed, the stenosis in the cricoid ring and the affected areas of the trachea can be completely excised leaving a gap which may be up to 4 or 5 cm. in length for primary anastomosis.

The closure of the gap can be accomplished in three ways: First, the patient's head should be flexed and secondly, the trachea should be freed up anteriorly and posteriorly, thereby avoiding injury to the tracheal blood supply. Finally, a most effective manner of decreasing the gap is by laryngeal drop. This may be carried out by incising the thyroid muscles and some bundles of the inferior constrictor which are attached to the superior horn of the thyroid cartilage. The thyro-hyoid membrane is then carefully and completely incised. This drop will reduce the gap by approximately 2 cm.

The suturing of the trachea to the thyroid cartilage anteriorly and the posterior plate of the cricoid plate posteriorly is difficult because of the discrepancy in the sizes at this level. Posterior sutures should be placed first and then it is usually wise to place a stent in the lumen and suture the walls of the trachea and thyroid cartilages over this support. Sutures through the stent above and below the line of incision will also support this union by reducing tension on the sutures. The stent should be left in place for about four weeks and this can then be removed by an external approach which severs the wires and if necessary opens the larynx to remove the stent and to examine the line of sutures.

There is no doubt that this is the only effective manner of correcting significant subglottic stenosis. The surgery is extremely difficult and the procedure is time-consuming and demanding on the surgeon and the patient. Moreover, the end results are not always satisfactory. There appears to be an inevitable amount of scarring in the area which may affect the function of the vocal cords and inevitably some stenosis at the site of the anastomosis will occur. However, in most cases, we have been able to improve the airway of the patients so that they are able to carry on a normal existence. Post-operative tracheograms should be made, but they are sometimes disappointing for reasons which are obscure. The best judge is the patient who will tell you whether the airway is good or bad, improved or otherwise.

Two further complications should be mentioned; one, of course, is the case in which there is bilateral abductor paralysis and where a variety of procedures need to be carried out in order to provide an adequate airway. It is perhaps not so important in these particular cases to be concerned about the quality of the voice. However, in my experience only

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the Woodman external approach to the arytenoid and its lateralization by this method can assure just the correct amount of airway consistent with a good voice.

The second complication frequently seen is an esophageal fistula at the site of the separation of the trachea from the lower border of the cricoid plate or at the site of the eroding cuff. This complication is extremely difficult to manage and requires the repair of the esophageal fistula at the time of the tracheal repair, preferably with the supporting interposition of the muscle grafts anterior to the esophagus to support the suture line. Such a complication should always be kept in mind because otherwise the tracheal repair will not be successful and further surgical procedures in the area will be complicated by excessive scarring and infection.

Carcinoma of the subglottic region

Laryngeal malignancies are fortunately rare and in most series the primary subglottic tumours occur in only 3 or 4 per cent of the laryngeal lesions. In our particular experience in more than 1,100 laryngeal cases, we can only definitely confirm the diagnosis of primary subglottic tumours in approximately fifteen cases. However, the nature of malignancies occurring in the subglottis is sufficiently different from that in the two other laryngeal regions to merit discussion and comment.

The common presenting symptom of glottic carcinoma is hoarseness. In lesions involving the subglottis, the patient complains not of hoarseness but of stridor. Hoarseness may occur but it would be at a much later time after the tumour has extended to the glottic region. Moreover, it is often very difficult to see tumours in the subglottis with normal mobile vocal cords. In my experience, diagnosis has been greatly delayed in these cases to the point that tracheotomies have very commonly had to be carried out on the initial visit. It may be only at this point that laryngeal tomography and endoscopy identifies a malignant swelling in the subglottic region and the diagnosis is established.

There is a great difference of opinion as to the appropriate management of malignant lesions in the subglottic region. This is probably the result of the infrequent occurrence of these tumours as well as to confusion as to the site of origin. Generally speaking, subglottic malignancies tend to spread circumferentially and almost always invade the conus elasticus and affect the vocal cord at a late state in their development. They commonly extend outside the subglottis through the cricotracheal membrane (Fig. 8) anteriorly and laterally and through the mucosa of the hypopharynx by invading the oesophagus and extending proximally in its anterior wall. The lymphatic spread of these tumours is to the paratracheal, paraoesophageal, and Delphian nodes and to the thyroid glands directly. In our experience, involvement of the mediastinal nodes

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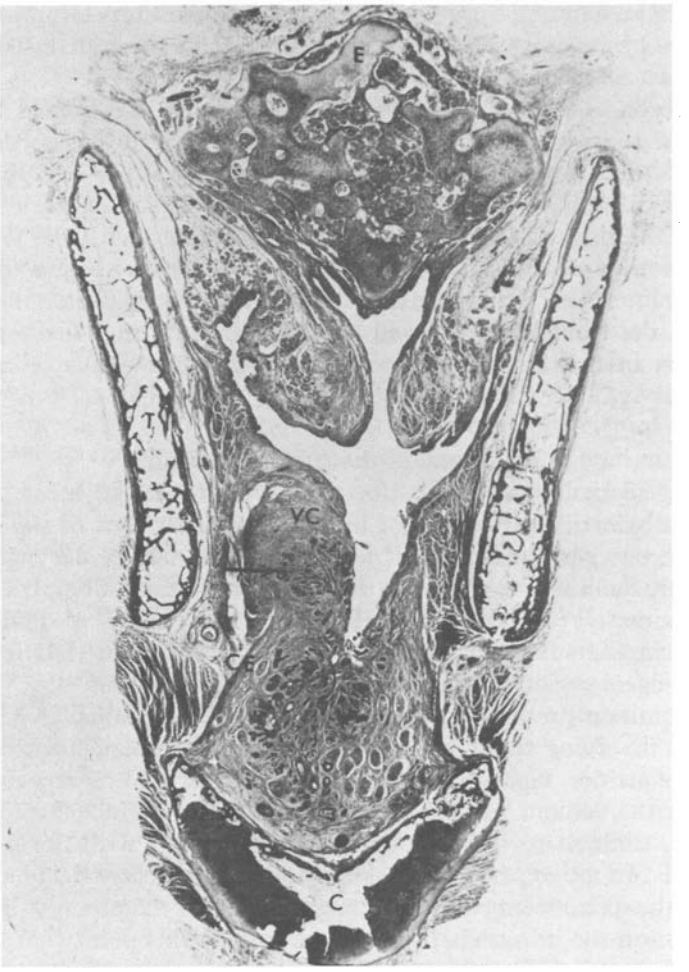


FIG. 8.

A coronal section of a subglottic carcinoma extending circumferentially and destroying the conus elasticus at the arrow to involve the vocal cord.

E = epiglottis; VC = vocal cord; CE = conus elasticus; C = cricoid cartilage.

and the deep cervical chain is not as common except in the terminal stage of the disease.

Regardless of the method of treatment of such malignancies, the prognosis of the patient is less than satisfactory. Most series report a survival figure of 30–50 per cent of their cases. Our experience has been equally depressing and a high percentage of the patients we have had have died of distant metastases when the primary disease has been controlled.

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I believe, therefore, that these tumours should be regarded in the same light as carcinomas involving the hypopharynx. They are extremely malignant lesions and require vigorous treatment regardless of the method used. The extent of the tumour should be very carefully assessed using all the methods available to us as this assessment will have a direct bearing upon the extent of the surgical excision.

Improvement in our results of treatment of laryngeal cancer must await improvement of our methods of the assessment of the extent of the primary lesion. Direct and indirect laryngoscopy, tomography and contrast laryngography are just not adequate for our present needs. Our histological study of laryngeal cancer has emphasized this point again and again. A most expert examiner of the larynx will fall far short in his estimate of the extent of the primary lesion. We must make a concentrated effort to improve our methods of diagnosis which will be by improvement in radiological techniques.

The definition of the extent of subglottic carcinomas is particularly difficult. In the more advanced cases, we can obtain some idea when we note that the tumour has fixed the vocal cord. This means that the malignancy has passed through the elastic lamina and has involved the musculature of the cord itself. Almost inevitably such tumours also will escape from the larynx through the crico-thyroid membrane, either laterally or anteriorly. Because of the tendency for subglottic tumours to spread circumferentially, there is certainly no assurance that it will also not have involved the mucosa of the hypopharynx and the thyroid glands. Such extension is adequately proven by experiences of mine and many others in the frequency of local recurrence following surgery.

Once the assessment of the primary lesions has been attempted, I believe the patient should be treated with primary radiotherapy carefully planned to include the lymph nodes of the tracheal and oesophageal areas as well as the superior mediastinum. If the primary tumour disappears with radiotherapy and there is no evidence of cervical secondaries, I believe it is quite justifiable to continue to observe and examine the patient and do nothing further.

If, following radiotherapy, the primary lesions do not disappear, or if there is tumour recurrence, surgery should be undertaken within about two months of the termination of the radiotherapy. In our experience, eight out of twelve patients failed curative radiation therapy.

The surgical technique will have to be most extensive including laryngectomy, thyroidectomy, extensive tracheal removal and considerable removal of the mucous membrane and the anterior walls of the oesophagus and pharynx. Such a surgical procedure will inevitably result in a prolonged post-operative period and the complications of fistula formation will be high. Block dissection should not be carried out prophylactically, but at operation the cervical chains on both sides should

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be examined and if there are any positive nodes, block dissection on the involved side should be carried out.

Even with such a rigorous regime, I am afraid that our results may not rapidly improve. In the first place, these tumours are rare and their diagnosis, unless we are alerted to their presence will inevitably be delayed. Secondly, such tumours have shown a high incidence of distant metastases and of course surgical procedures locally cannot control this type of disease.

I wish to mention only briefly the most interesting malignant condition which occurs only in the laryngeal subglottis and that is chondrosarcoma. Chondrosarcoma occurs almost exclusively in the cricoid cartilage and in my experience often involves the entire ring, inevitably leading to stridor and tracheotomy (Fig. 9). Chondromas of the larynx have been reported, but the pathological distinction between malignant and benign cartilaginous tissues of the larynx is most difficult and controversial. It is probably safer to assume that all chondromas in the laryngeal region are chondrosarcomas. Fortunately, this tumour although malignant is relatively benign and very slow-growing indeed. If the tumour is sufficiently widespread to require total laryngectomy for its removal, I believe that treatment should be primarily by radiotherapy. If, however, the

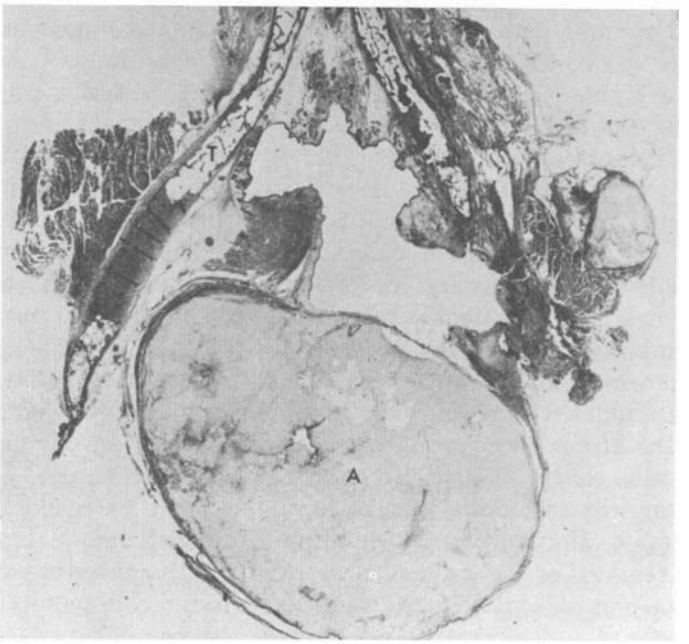


FIG. 9.

Horizontal section of the larynx demonstrating a chondrosarcoma at A involving the cricoid cartilage.

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tumour is of such a size that excision can be undertaken without total laryngectomy, perhaps by subglottic excision and anastomosis, then surgical procedure should be the treatment of choice. Recurrence following such excisions is common, but the growth rate of this tumour is slow and the extension of the tumour distally to the lymph nodes or to the lung is almost unknown.

Subglottic stenosis in infants and children

Surgical resection of the laryngeal subglottis in the adult is sufficiently challenging to excite our interest. Results of our therapy are relatively good although the period of morbidity is considerable.

In the case of the child and infant, the problem of subglottic stenosis is much more severe. There are a few cases of congenital laryngeal stenosis occurring primarily or as complications of congenital cysts (Fig. 10), but in the main, laryngeal subglottic stenosis in the infant and child is the result of intubation or tracheotomy for various conditions producing respiratory obstruction.

Traditionally, the method of treatment for these conditions has been tracheotomy and observation, until such time as the cartilaginous structure of the larynx allows for more definitive treatment or solves the problem by the increase in the lumen in the subglottis by normal growth.

We have been concerned recently about this type of treatment because of the high incidence of mortality in children with long-term tracheotomy. A review at the Sick Children's Hospital in Toronto showed there was a 30 per cent mortality amongst our long-term tracheotomies, usually in those children who have been discharged home with such a tube in place.

The appropriate management of subglottic stenosis in infants and children is not yet clear. It is assumed that excision and anastomosis of the cricoid at such a young age would interfere with the subsequent growth of this structure. In actuality, we have no proof of the fact. In the meantime, several other methods are being attempted, but are still in the experimental stage.

One method which is currently being revised with some interest has been the interposition of the thyroid cartilage as a rotation graft to lie between the cut edges of the anterior ring of the cricoid cartilage.

Another is the splitting of the anterior and posterior rings of the cricoid in a sagittal plane which opens the diameter of the subglottic circle without disturbing the oesophageal mucosa. A large stent maintains the increased lumen until healing and fixation has taken place. I believe both these methods are still in the experimental stage, but may prove of great value in the future.

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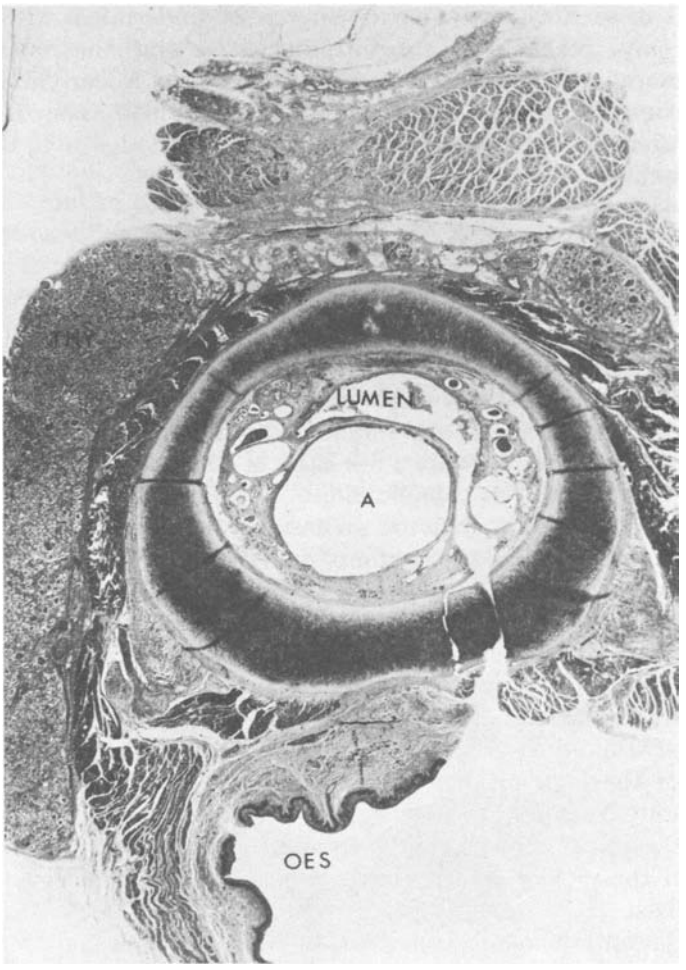


FIG. 10.
A horizontal section of an infant's larynx to demonstrate multiple cystic degeneration of the subglottic mucous membrane. The largest cyst can be seen at A.

Summation

We have been discussing the affliction of a small part of the human anatomy which, when diseased, can bring great hardship and suffering to our patients. The young woman or man who develops subglottic stenosis is facing a lifetime of tracheotomy respiration, often also the loss of speech. Malignancy in this area is unusual in its signs and symptoms, difficult to diagnose and highly fatal.

We cannot as yet claim success in the management of such lesions. There is no area of surgical endeavour which requires greater skill and patience on the part of the surgeon and more co-operation and teamwork

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from the supporting medical services. The patient must have a great desire to survive and great faith in those who would help him.

It was Hippocrates who said: 'Life is short the art is long, experience treacherous, and judgment difficult'. This summates our position as we approach the management of the diverse and fascinating affliction of the human subglottis.

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