Benign Tumours of the Larynx

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SUMMARY

Over the 8-year period 1971 - 1978, 743 benign lesions of the larynx, of which 551 were pseudotumours and 192 were benign neoplasms, were surgically treated at Groote Schuur Hospital. In comparison, during the same period 402 malignant tumours of the larynx were also seen. The commonest benign lesions were vocal cord nodules, almost exclusively found in women, and the vocal cord polyp, predominantly found in men. The various specific pathological entities encountered are discussed.


Benign swellings of the laryngeal mucosa, connective tissue or cartilaginous skeleton are common in laryngological practice. A variety of histologically definable lesions occur, and in this presentation both pseudotumorous alterations and true neoplastic tumours are included.

Unless otherwise contraindicated, it is usual practice to biopsy or biopsy-excite tumours of the larynx unless the clinical or laboratory diagnosis, as in cases of tuberculosis, is obvious. Even so, management of a chronic laryngeal lesion without histological confirmation of the diagnosis must be guardedy followed; with failure of response to treatment, biopsy becomes mandatory. This cautious approach, especially with hyperplastic inflammatory lesions, exists because laryngeal malignancy may macroscopically simulate or accompany chronic laryngitis.

The facility with which laryngeal tumours are diagnosed and treated is due to the ease of clinical examination by indirect (mirror) laryngoscopy and the safety of surgery by direct laryngoscopy. However, it must be added that in some circumstances the one procedure may be too difficult and the other may be too hazardous to perform.

Routine visual inspection of the larynx became possible over 100 years ago with the discovery of the simple method of mirror laryngoscopy that is still practised today. Credit for this major contribution to laryngology is given to Manuel Garcia, a Parisian voice teacher. He publicised his discovery (for which he received due recognition from the medical profession) in London in 1855, and later that year, Czermak successfully demonstrated throughout Europe an equivalent method for examination of the larynx.¹

Before the effective use of a head mirror, dental mirror and artificial light, more complicated methods had been attempted using candle light, sunlight and complex mirror systems. Digital palpation up to that time had been the only reliable clinical method of examination of the endolarynx.

Direct examination of the larynx with the rigid laryngoscope, first performed by Kirsten in 1895, and standardized by Killian early this century,² is today routinely used for diagnostic and surgical procedures of the larynx. As the safety of anaesthesia has progressed, so too have these procedures, and with the use of the operating microscope, increasingly skilful surgery has become possible. This has also permitted a vastly improved visual appraisal of lesions of the larynx.

In more recent years, illumination by the flexible fibreoptic magnifying endoscope, combined with minor procedures such as tissue biopsy, has helped to resolve the problem of difficult or hazardous direct laryngoscopy.³ In contrast, the patient who is co-operative and easy to examine is suited to minor surgical methods, such as laryngeal biopsy and polyp removal, performed under indirect vision.

CLINICAL PRESENTATION

During the 8-year period 1971 - 1978 inclusive, over 1 500 direct laryngoscopies were performed at Groote Schuur Hospital, Cape Town. These were done for diagnostic or therapeutic purposes, and were mostly carried out with the aid of the Zeiss operating microscope. This was the surgical management of choice for benign tumours of the larynx seen during this period and reported here. These years were chosen for review because of accurate clinical records of patients' lesions, the author's personal involvement in the majority of these problems, and an earlier change to a standardized surgical management of these lesions.

Unless contraindicated, general anaesthesia was used and in the majority of patients was induced and maintained without endotracheal intubation. This particular method of laryngoscopy anaesthesia, which for some years has been the established practice at Groote Schuur Hospital, was developed in order to improve laryngeal exposure and to facilitate endolaryngeal microsurgery.⁴ During this time, the death of a young woman occurred during anaesthetic induction using a different technique.

A total of 743 intrinsic non-malignant laryngeal lesions are reviewed (Table I). These are categorized into pseudo-tumours and benign neoplasms, and each specific pathological entity is presented separately. The relative proportion of pseudotumours, benign tumours and malignant tumours of the larynx seen during the same period is comparable to that of other large series.⁵

| TABLE I. TUMOURS OF THE LARYNX SEEN AT GROOTE SCHUUR HOSPITAL 1971 - 1978 |
|---------------------------------|--------|--------|--------|
|                                  | Male   | Female | Total  |
| Pseudotumours                    | 315    | 236    | 551    |
| Benign neoplasms                 | 140    | 52     | 192    |
| Malignant neoplasms              | 364    | 38     | 402    |
| **Total**                        | 819    | 326    | 1 145  |

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PSEUDOTUMOURS

A total of 551 non-neoplastic tumours of the larynx were seen and of these 58% were in males (Table II). Included in this group are laryngeal cysts and infiltrations. The laryngocele, which is an aercele, is not listed, but is included under ‘Discussion’.

<table>
<thead>
<tr>
<th>TABLE II. PSEUDOTUMOURS OF THE LARYNX</th>
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<tr>
<td></td>
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<tr>
<td>Male</td>
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<tr>
<td>------------</td>
</tr>
<tr>
<td>Cordal polyp and nodule</td>
</tr>
<tr>
<td>Chronic diffuse</td>
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<tr>
<td>inflammation</td>
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<tr>
<td>Cordal granuloma</td>
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<tr>
<td>Cordal ulcer</td>
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<tr>
<td>Tuberculosis</td>
</tr>
<tr>
<td>Histoplasmosis</td>
</tr>
<tr>
<td>Cysts</td>
</tr>
<tr>
<td>Lipoid proteinosis</td>
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<tr>
<td>Total</td>
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Cordal Polyp and Nodule

Cordal polyps and nodules form the largest group of non-neoplastic laryngeal disorders and were diagnosed in 292 patients of whom 136 were male. A number of synonyms (singer’s, preacher’s and screamer’s nodule, laryngeal polyp, vocal cord varix and chonditis tuberosa) exists for this condition. Clinically, both the polyp, of which there are a variety histologically, and the nodule can be distinctly and differentially defined, but because of their pathogenesis, pathological definition and potential clinical behaviour, both are considered as variables of essentially the same disorder in which the cordal nodule is the earliest and smallest clinical manifestation. The exact pathogenesis of these lesions, the most common of laryngeal abnormalities, remains uncertain. The relationship with vocal abuse and a preceding upper respiratory tract infection is well known, but this is not always present. However, vibration, trauma, toxins and infection, despite the frequent absence of identifiable inflammation, are strongly and reasonably suspected to be causes.

The macroscopically identifiable vocal nodule, which is usually bilateral, and always on the free margin of the vocal cord at the junction of the anterior and middle thirds, is a discrete, subepithelial fibrous and occasionally hyalinized tumour in women. The more florid polypoid lesion is more common in men, usually occurs singly, and arises on the superior or undersurface of the vocal cord, or at the anterior commissure. A variety of fibrous, vascular, myxoid or fibrinoid histological changes, probably representing different phases of the same disease, is seen, but local inflammatory changes are absent.

Cordal Polyposis (Reinke’s Oedema)

This diffuse polypoid mucosal condition is a distinct entity in which fluid collects in the subepithelial space of the anterior two-thirds of both vocal cords. At first fusiform, the swelling may become gross and patulous, appearing as two cordal fronds on mirror examination. Unlike the cordal polyp, fibrosis and vascularization do not occur. Microsurgical stripping, preferably of one side at a time, is the treatment of choice.

Cordal Granuloma

Cordal granulomas were found in 18 patients, 17 of whom were males. When the condition is unilateral, it most commonly occurs after laryngeal surgical procedures and when bilateral after endotracheal intubation. Single granulomas respond well to endoscopic excision, but bilateral granulomas, which are situated at the tip of the arytenoid vocal process, notoriously recur despite careful resection of the underlying cartilage. Mucoperichondrial ulceration and perichondritis cause granulation tissue formation, and the constant trauma of phonation perpetuates the condition. However, with time, a natural healing process occurs with basal fibrosis and pedunculation, and may itself lead to spontaneous resolution. This was seen in 1 adult male who underwent surgery for removal of a granuloma, followed by excision of the arytenoid vocal process at a later stage, and two further removals before the spontaneous disappearance of the recurring single granuloma. The short-term use of steroid and zinc sulphate medication is of uncertain merit.

Cordal Ulcer (Contact Ulcer, Contact Pachydermia)

Surprisingly a diagnosis of cordal ulcer was made in only 15 patients, of whom 11 were male. A patch of pachydermia, occasionally centrally pitted and localized posteriorly to the free margin of the vocal cord, develops as a result of constant vibration trauma to the mucosa covering the tips of the arytenoid vocal processes. When excising this thickened epithelium, care must be taken not to injure the underlying cartilage. If possible, an initial trial of voice rest is preferable for the smaller lesion. The few lesions which were surgically excised in this series did not present further problems.

Chronic Nonspecific Inflammation (Hyperplastic Laryngitis)

Chronic nonspecific inflammations include the diffuse and chronic inflammatory hyperplastic states of the larynx, and exclude the localized conditions hitherto discussed.

Characteristically, an intractable glottic and supraglottic epithelial metaplasia and hyperplasia of variable extent and severity are present. Initiated and influenced by toxic irritants or chronic sepsis, it is usual for the disorder to persist. Treatment is directed at the eradication of causal factors, of which smoking is the most potent, and when possible, the surgical stripping of affected laryngeal epithelium.

Chronic Specific Inflammation

Tuberculosis of the larynx, with and without retrospective radiological evidence of pulmonary tuberculosis, but confirmed on laryngeal biopsy, was found in 8 patients, all of whom were male, aged between 13 and 65 years. Patients with pulmonary tuberculosis have also presented with laryngeal symptoms, but have been diagnosed without laryngeal biopsy.
Mucosal inflammation, oedema, granular thickening, ulcerations and tubercles occur to a variable extent. These changes may simulate chronic hyperplastic laryngitis or even carcinoma. Primary tuberculosis of the larynx is now uncommon enough to pass unrecognized; however, prompt diagnosis remains essential.

Laryngeal histoplasmosis was diagnosed in 1 patient, a 38-year-old man, in whom there was no evidence of pulmonary or mucocutaneous disease. The causative fungus, *Histoplasma capsulatum*, is found in many parts of the world, and although the disease occurs in the Transvaal and Zimbabwe-Rhodesia, it is rare in the Cape Province."

**Retention Cysts**

Laryngeal cysts occurred in 31 patients, of whom 14 were male. They arose around the epiglottis or on a false cord, and in the majority of patients were symptomless. In most of these patients the finding was made accidentally during anaesthetic induction. Pseudocysts which occurred on the vocal cords due to cystic degeneration of existing polyps were also seen, but they are not included in this category. Treatment was by excision or by wide uncapping and marsupialization of the cyst.

Mention is briefly made of the laryngocele, which occurred in 7 patients seen during the same period, but it is not included in this series. The abnormal air-containing dilatation of the laryngeal sacule distorts the lateral endolaryngeal wall simulating a submucosal tumour or cyst of the false cord. Further extension through or around the thyrohyoid membrane produces a clinically definable aerocele that lies lateral to the hyoid bone. These lesions should be surgically excised with removal of a segment of overlying thyroid cartilage to permit access to the lesion’s internal component.

**Lipoid Proteinosis**

This unusual autosomal recessive inherited disorder, which is of special interest in the Cape Province, was seen in 3 women aged 24, 29 and 38 years. Deposition of complex glycolipoprotein occurs around small blood vessels, and from birth these may be evident as multiple cutaneous tumours. Hoarseness is an early feature, and laryngeal involvement may precipitate fatal airway obstruction. The diagnosis, however, can be made without recourse to laryngoscopy, the anaesthetic risks of which are increased by the involvement of cerebral vessels.

**BENIGN NEOPLASMS**

A total of 192 laryngeal lesions are included in this category (Table III). On the premise that hyperplasia is synonymous with neoplasia, and that these epithelial alterations may progress to frank epithelioma formation, the dysplastic lesions and carcinoma *in situ* are also considered in this group. The remaining true neoplasms are small in number and variety. Compared with other studies, these established and clearly definable benign neoplasms have been less common than the laryngeal carcinoma seen during the same period.

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
<th>Total</th>
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<tbody>
<tr>
<td>Solitary papilloma</td>
<td>26</td>
<td>15</td>
</tr>
<tr>
<td>Juvenile papillomatosis</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Granular cell myoblastoma</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Haemangioma</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Chondroma</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Juvenile fibromatosis</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Dysplasia</td>
<td>87</td>
<td>28</td>
</tr>
<tr>
<td>Carcinoma <em>in situ</em></td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>140</strong></td>
<td><strong>52</strong></td>
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**Solitary Papilloma**

Solitary squamous papillomas are the commonest benign neoplasm of the larynx, and in this series occurred in 41 patients, of whom 26 were male. Most presented in the fourth and fifth decades.

The lesions were seen as small, discrete pedunculated or sessile cauliflower-like warty growths on the vocal cords, and rarely present on the false cords or epiglottis.

Although the surrounding laryngeal epithelium is invariably normal, these lesions can be considered exaggerations of localized areas of epithelial hyperplasia, in which a distinct margin exists between it and normal tissue. Surface keratinization may occur to a varying extent and should be regarded with suspicion. In any event, these circumscribed areas of hyperplasia are considered to be pre-malignant and require careful and complete excision.

**Juvenile Papillomatosis**

Juvenile papillomatosis was present in 11 children of whom 7 were male. This dangerous condition of a florid papilliferous growth across the laryngeal mucosa is readily identifiable on laryngoscopy. The condition is thought to be of viral origin; its effective treatment is difficult, and recurrence after partial eradication is common. Local destruction of these growths by repeated diathermy was the treatment used, but methods such as cryosurgery, endolaryngeal ultrasound, laser surgery, and autogenous vaccine have been used elsewhere with some success. Most patients with this disease require tracheostomy until spontaneous resolution, which is probably auto-immunological, occurs, usually at the onset of puberty.

**Granular Cell Myoblastoma**

Histological diagnosis of granular cell myoblastoma presents little difficulty, yet its true nature is uncertain. It has been classed as a neoplasm of skeletal muscle, a fibroblast, histiocyte, mesenchymal cell and Schwann cell, and alternatively, a degenerative lesion. Seven of these tumours were seen and treated successfully by endolaryngeal excision. Three of these, as well as one earlier example, have previously been reported.

**Haemangioma**

Haemangioma was present in 3 patients. Histologically, vascular cordal polyps can be mistaken for this rare...
tumour, which occurs either as a congenital capillary haemangioma or as a cavernous haemangioma. The congenital lesion undergoes spontaneous involution during infancy, but in the adult the lesion may enlarge and require resection.

**Chondroma**

A 68-year-old man presented with a laterally situated subglottic chondroma, which was completely excised from the cricoid cartilage via a laryngofissure. These laryngeal tumours are extremely rare, are usually subglottic, and patients present with airway obstruction if the lesion is internal, or with a hard palpable tumour of the laryngeal skeleton if it is external. Calcification, myxomatous degeneration or sarcomatous changes can occur.

**Juvenile Fibromatosis**

A 5-year-old boy presented with stridor requiring urgent tracheostomy. Histological examination of a firm, smooth, unilateral subglottic tumour showed abundant mature fibroblasts in a uniform arrangement. The tumour was excised endoscopically in 1974 without further recurrence. The use of the term 'fibroma' is not universally accepted, since histological appearances often do not differentiate between true tumours and fibromatous masses; prediction of their biological behaviour is therefore dependent upon patient age and tumour sites.

**Chronic Dysplasia**

Chronic hyperplasia can be classified on macroscopic appearances, but this gives no indication of prognosis. A distinction between benign, premalignant and invasively malignant behaviour patterns can only be made with confidence on histological assessment, yet even so, that of 'premalignancy', except in carcinoma in situ, remains unpredictable.

Kleinsasser grades laryngeal mucosal hyperplasia into three forms, i.e. from the uniform and thickened epithelium, the circumscribed or diffuse epithelium with variable keratinization and absent cellular atypia to the dysplastic epithelium with irregular, immature and atypical cells and a distorted but intact basement membrane. The early recognition of this last form is of considerable importance, since eventual malignant transformation is to be expected; unlike the cervix uteri, the larynx cannot be prophylactically amputated with impunity. Carcinoma in situ is an extension of this cellular gradation, but it remains distinct from frank carcinoma by the absence of basement membrane invasion. It is, however, looked upon with similar gravity, but because of its limited epithelial extension, local endolaryngeal resection without the use of cobalt therapy has been the treatment of choice.

**DISCUSSION**

A number of benign laryngeal lesions such as adenoma, leiomyoma, rhabdomyoma, neurofibroma, paraganglioma, salivary gland tumours, Wegener's granulomatosis, syphilis, sarcoid, amyloid and interarytenoid pachydermia were not encountered, and are therefore not considered in this presentation.

The commonest lesion in men was the vocal cord polyp and in women the vocal cord nodules. The chronic inflammatory hyperplasias and dysplasias together accounted for an equivalent number of lesions, but of these, 71% were in male patients. All 13 patients with carcinoma in situ were males. A significant male preponderance also existed for laryngeal tuberculosis, cordal granuloma and cordal ulcer.

Age factors, where unusual, have already been mentioned. However, there is a tendency by laryngologists not to admit children with vocal cord alterations for endoscopy in the belief that vocal cord nodules in childhood readily recur. Because of modern methods of microsurgery for cordal tumours, this attitude is now unfounded, since these lesions in the older child can be completely removed without expectation of recurrence.

There was a tendency during this time to submit adult patients to laryngoscopy for the removal of small vocal cord pseudotumorous lesions. This early procedure is considered justified since the abnormality is dealt with immediately, recovery of vocal cord function and normal voice prompt, and the true nature of the lesion is clarified if doubt exists. In contrast, direct laryngoscopy for the chronic, diffuse pseudotumorous lesion is of limited diagnostic and therapeutic value. However, malignant change can masquerade within chronic hyperplastic laryngeal mucosa; recognition of this requires clinical experience. Biopsy is necessary when keratinizing epithelium is evident.

The role of the speech therapist is important in voice rehabilitation and in prevention of recurrence after surgery for those conditions in which vocal abuse has been an aetiological factor. The small circumscribed pseudotumour is a self-resolving condition and, provided the cause of 'premalignancy' is eradicated, resolution can be expected with time. The modern laryngologist, however, must decide whether this time factor and the possibility of failed spontaneous cure is preferable to endolaryngeal surgery and its accompanying risks.

**REFERENCES**