

## Chapter 34

### The Pharynx

#### Tonsils and Adenoids

**Surgical Anatomy.-** The lymphadenoid tissue of the nasopharynx is Nature's barrier to bacterial invasion and antigen recognition in early life. The aetiology of certain cervical inflammations can be better understood if Waldeyer's inner and outer rings (Heinrich Wilhelm Gottfried Waldeyer-Hartz, 1836-1921. Professor of Pathological Anatomy, Berlin.) are studied. *The faucial tonsils* are the largest and most important moieties of the inner ring. The tonsils contain tortuous crypts, which extend throughout the tonsillar substance to the external capsule. These crypts can harbour pus and micro-organisms. Clothing the lateral two-thirds of each tonsil is the capsule, a well-defined structure composed of fibrous and elastic tissue, and muscle fibres. The medial third of the tonsil lies between the pillars of the fauces and, being bereft of covering, is accessible to clinical examination. The tonsil has an exceptionally good blood supply. It is well to bear in mind that a tortuous *facial artery* may be closely related to the lower pole. A vein unaccompanied by an artery - the paratonsillar vein - is often a source of serious venous bleeding following tonsillectomy. When divided, the bleeding end retracts into the upper part of the tonsillar fossa, and must be found and ligated before the patient leaves the theatre.

**Examination of the nasopharynx, pharynx and larynx.-** Fibre-optic techniques are now available for examination of nasopharynx, pharynx and larynx. The fibrescopes for this purpose may be rigid or flexible. Surface anaesthesia only is required (as for bronchoscopy). Although in many cases a good fibre-optic examination obviates the necessity of giving a general anaesthetic for direct endoscopy, should there be any doubt or if a specific lesion is apparent, then direct endoscopy must be undertaken. This also permits biopsy material to be taken.

#### Enlargement of the Tonsils and Adenoids

**Enlarged tonsils** are not necessarily infected; a certain amount of hypertrophy is common in early childhood. As adult life approaches, the tonsils, together with other lymphoid tissues, tend to atrophy. Excessive hypertrophy is often bilateral. Occasionally, the tonsils are so large that they almost meet in the mid-line.

**Enlarged Adenoids.-** (To be exact - there is only one adenoid.) The 'nasopharyngeal tonsil' is present at birth but undergoes atrophy at puberty, although remnants of it often persist into adult life. The most common period for hypertrophy is between the ages of four and fourteen, and a damp climate favours the development. Enlarged adenoids consist of masses of lymphoid tissue covered by ciliated epithelium and supported by a delicate framework of fibrous tissue.

Considerable adenoid hypertrophy causes the patient to snore loudly at night and to breathe through the open mouth, giving that well-known vacant expression. Added to this, hearing is impaired by the hypertrophied lymph-adenoid tissue obstructing the orifices of the

Eustachian tubes (Bartolommeo Eustachi (Eustachius), 1520-1574. Professor of Anatomy, Rome.), and infections of the middle ear and upper respiratory tract occur frequently.

**Acute follicular tonsillitis** is a common condition characterised by pyrexia associated with a sore throat. The cervical lymph nodes are enlarged and tender. Pain occasionally radiates up to the ears. The most usual cause is *Streptococcus pyogenes*. On examination the tonsils are swollen, and yellow spots, due to pus exuding from the tonsillar crypts, can often be discerned. The condition can be distinguished from diphtheria by a rapid bacteriological examination of a smear.

**Treatment.-** Aspirin is administered to relieve pain and gargles of glycerol-thymol are soothing. If the symptoms persist after 24 hours, a throat swab should be taken for culture and penicillin is given until antibiotic sensitivities are known.

**Chronic tonsillitis** is sometimes associated with hypertrophy. During early childhood chronically inflamed tonsils are usually soft, but by the time puberty has been reached they have frequently become indurated and adherent, due to recurrent attacks of inflammation and subsequent fibrosis. The tonsillar lymph node of the jugular chain is usually palpable. Sometimes pus and debris can be expressed from infected tonsillar crypts to enable a bacteriological examination to be made.

### **Tonsillectomy**

- Indications.-**
1. A history of recurrent attacks of acute tonsillitis.
  2. One attack of peritonsillar abscess.
  3. Chronic tonsillitis (especially if associated with cardiac, renal or rheumatic problems).
  4. Biopsy for suspected malignancy.

Removal of the tonsils may also be considered in the treatment of tuberculous and non-tuberculous cervical adenitis.

(Should a recently tonsillectomised patient contract poliomyelitis, he is liable to develop the more lethal bulbar type. Tonsillectomy is therefore contraindicated during an epidemic of this disease. The British Association of Otolaryngologists recommend inoculation against poliomyelitis before tonsillectomy is undertaken. The child should have had at least two inoculations before the operation.)

**Operation.-** Tonsils are removed by dissection. If there has been a recent infection or if an associated arthritic, renal or cardiac lesion is suspected, it is wise to cover the procedure with penicillin to prevent bacteraemia and aid local healing.

Either local or general anaesthesia can be employed. (Suggested pre-op drugs for children - Quinalbarbitone 6 mg/kg (max 100 mg). Atropine 20 micrograms/kg (max 600 micrograms).) The mouth is kept open and the tongue depressed with a Davis's gag (The original Davis's gag was invented by Dr Davis, of Boston, Mass. Henry Edmund Gaskin Boyle, 1875-1941, anaesthetist, St Bartholomew's Hospital, London, improved it). The tonsil is seized with vulsellum forceps. An incision is made through the mucous membrane, and the

capsule of the tonsil is exposed. The tonsil is removed by dissection, starting at the upper (palatal) pole. When the pedicle is defined, it is severed by a wire snare. Bleeding can be accurately stopped by ligating any bleeding vessels, arteries or veins, so that the patient does not leave the operating table until all bleeding has ceased. Until the patient has recovered consciousness he should be kept with his head low and well over to one side. *On no account should he be permitted to lie on his back or be left unattended.*

### **Complications after tonsillectomy**

1. *Obstruction of the airway*, eg, blood clot or the tongue falling back.
2. *Inhalation of foreign material*, eg, blood, vomitus, broken teeth.

3. *Haemorrhage*. Reactionary haemorrhage occurs within the first few hours. It may be recognised by blood appearing from the corner of the mouth or nostrils, a rising pulse rate, generalised irritability. Immediate measures to be taken are: (1) Removal of clot from the tonsillar bed. (2) The application of pressure by means of a swab on a holder.

If bleeding persists in spite of these measures, an intravenous infusion must be set up and blood taken for grouping and cross-matching (Chapter 5). The patient should be returned to the operating theatre, and under general anaesthesia the bleeding-point sought and ligated. When the bleeding-point cannot be found, coaptation of the pillars of fauces with sutures will arrest the haemorrhage. (Morphine must not be given to children suffering from post-operative haemorrhage. It is a factor in tonsillectomy deaths.)

### **Adenoidectomy**

**Indications.**- Hypertrophic adenoids associated with: (a) Recurrent otitis media. (b) Post-nasal obstruction. (c) Post-nasal discharge. (d) Recurrent sinusitis. Adenoids can be removed alone or in conjunction with tonsillectomy.

**Removal of Adenoids.**- Adenoids are removed with a guarded curette (Sir St Clair Thomson, 1859-1943. Surgeon, Ear, Nose and Throat Department, King's College Hospital, London.) pressed against the roof of the nasopharynx and then carried backward and downward with a firm sweeping movement. The after-treatment is similar to that described above. Reactionary haemorrhage may be stopped by sitting the patient bolt upright. As a last resort, the nasopharynx may have to be packed (Chapter 33).

### **Malignant Tumours of the Tonsil**

Both carcinoma and lymphoma occur in the tonsil. The diagnosis in many instances is not easy. Any unilateral enlargement of the tonsil occurring in adult life should be regarded with suspicion. A biopsy is often required to confirm the diagnosis.

**Carcinoma of the Tonsil (85%).**- The patient is commonly an elderly man and pain is the leading symptom. The pain is severe and radiates to the ear, and, unlike that of tonsillitis, is unilateral. The breath is foul. Later, bleeding occurs, and as the ulcer deepens the loss of blood may be copious.

**Lymphosarcoma of the tonsil** (15%) has the reputation of being very malignant. While this is true if it is allowed to grow beyond the peritonsillar bed, the condition is by no means hopeless in its early stages. The patient is usually between fifty and sixty years of age, complains of a lump in the throat, which in the early stages is painless. Thick speech is a common symptom, and the tonsil appears large and pale. Later, the growth spreads, and often forms a swelling of the palate, which may be mistaken for a peritonsillar abscess, and incised. Once the barrier formed by the capsule of the tonsil has been breached, the growth extends rapidly into the neck, often forming a swelling behind the angle of the mandible. While the cervical lymph nodes soon become involved, a swelling in this position is likely to be an extension of the primary growth. Eventually bleeding, dysphagia, and dyspnoea foretell that the end is not far distant.

*Treatment* of both these conditions is similar. Following biopsy or excision biopsy the patient is given a course of external irradiation to cover the primary site as far as the clavicle to include the cervical lymph nodes. Should there be any residual tumour or suspicion of recurrence, energetic radical surgery must be undertaken with skin-flap and mandibular repair as required. These measures have vastly improved the 5 year survival rate to about 50%.

### **Quinsy (peritonsillar abscess)**

As a rule the abscess is unilateral, but it is not uncommon for the contralateral side to become involved a few days later. The condition is rare in children, the incidence being highest in adult males. Extreme pain is experienced in the tonsillar region, radiating to the ear and to the side of the neck. Swallowing is so painful that saliva dribbles from the mouth; /// speech is thick and muffled. As the patient can open the mouth only to a slight extent, examination is often difficult. With good illumination, a diffuse swelling of the soft palate, mainly near the superior border of the affected tonsil, will be seen. The swelling displaces the oedematous uvula to the contralateral side.

**Treatment**, in the early stages, is the same as that for acute follicular tonsillitis. If suppuration occurs, evacuation of pus in the following manner should not be delayed.

A small scalpel is modified by winding a strip of strapping around the blade so that only 1 cm of the tip projects. Except in small children, no general anaesthetic is used. (In adult patients surface anaesthesia (5% cocaine on a pledget of wool) is the safest.) The patient sits upright. An incision is made in the position which is usually described as midway between the base of the uvula and the third upper molar tooth. Dressing forceps are now pushed firmly *directly backwards*. As soon as pus is encountered, the forceps are opened widely and withdrawn.

**Parapharyngeal abscess** is similar to the above, but the maximum swelling is behind the posterior faucial pillar, and there is little or no oedema of the palate. The abscess is opened with a really blunt instrument, such as a tongue depressor. Often the gloved finger will suffice.

## **Retropharyngeal Abscesses**

**Acute retropharyngeal abscess** is due to suppuration of the prevertebral lymph nodes. It is seen most commonly in children and 50% of cases occur under one year of age. The portal of entry is the tonsils, the nasopharynx, or the oropharynx. The condition may be accompanied by rigors, convulsions and vomiting. The neck is held rigidly, usually on one side, saliva dribbles from the child's mouth, and feeds are regurgitated. A croupy cough is common. The cry may resemble a 'squawk'. *Difficulty in breathing is the leading symptom* and this should always be the signal to examine a child's throat. The posterior wall of the pharynx is swollen. On digital examination a localised soft cushion-like protrusion can be felt on the posterior pharyngeal wall. The only condition with which acute retropharyngeal abscess may be confused is laryngeal diphtheria. A less acute form is seen in older children as a complication of otitis media.

**Treatment.-** No anaesthetic is used for infants, who must be placed in the prone position, with the head low. A pair of dressing forceps guided by the finger is thrust into the abscess cavity, the contents of which are evacuated. Suction must be available. Suitable antibiotic therapy is prescribed.

**Chronic retropharyngeal abscess** now rare, and sometimes due to an extension of tuberculosis of a cervical vertebra, presents with both a retropharyngeal swelling and a fullness behind the sternomastoid on one side. A chronic retropharyngeal abscess must never be opened into the mouth, for such a procedure will lead to secondary infection. The pus should be evacuated by an incision in front of the sternomastoid, to lead into the plane between the carotid sheath and the thyroid gland. The dissection towards the retropharyngeal space is conducted carefully until the abscess is opened. The cavity is then mopped dry and the wound closed. Suitable treatment of the underlying tuberculous lesion must then be instituted (Chapter 3).

## **Diverticulum of the Pharynx**

### **Pharyngeal Pouch**

**Aetiology.-** The pouch is a protrusion through Killian's dehiscence (Gustav Killian, 1860-1921. Professor of Laryngo-rhinology, Berlin), that weak area of the posterior pharyngeal wall between the oblique fibres (thyropharyngeus) and the sphincter-like transverse fibres (cricopharyngeus) of the inferior constrictor muscle. Continued imperfect relaxation of the cricopharyngeus on swallowing and therefore repeated moments of high pressure as a bolus of food is propelled on its way to the oesophagus initiate the pouch. As it enlarges the resistance of the vertebral column behind causes it to turn outwards, usually to the left.

**Clinical Features.-** Patients suffering from this condition are usually elderly, and it is twice as common in men as in women.

There are three stages in the development of symptoms.

*Stage I.-* There is a small diverticulum directed towards the vertebral column. Usually it is symptomless, and the finding of it is incidental during the course of a barium swallow.

Occasionally it gives rise to symptoms identical with those of a foreign body in the throat. At this stage the diverticulum can be ignored.

*Stage 2.-* The diverticulum is larger and more globular, but its mouth still lies in the vertical plane. Regurgitation of undigested food at an unpredictable time after a meal, during the swallowing of the next meal, or after turning from one side to the other at night, is the chief complaint. Sometimes the patient is awakened from sleep by a feeling of suffocation, followed by a violent fit of coughing. Infrequently an abscess of the lung results from food inspired from the pouch. Removal of the pouch is indicated.

*Stage 3.-* The pouch has become larger, and what is so important is that its mouth looks horizontally upwards. The fundus of the pouch has become dependent, and consequently when the pouch is full it compresses the oesophagus. The symptoms of the second stage persist; in addition, there are gurgling noises in the neck, especially when the patient swallows. In about one-third of cases, the pouch is large enough to form a visible swelling in the neck: sometimes such a pouch can be seen to enlarge when the patient drinks. Nevertheless, when this stage has been reached the symptom that transcends all others is increasing dysphagia, and in a large number of instances it is this symptom alone that compels the patient to seek relief. Eventually there is progressive loss of weight due to semi-starvation, and cachexia is sometimes extreme.

**Radiography.-** If a pharyngeal pouch is suspected, a very thin emulsion of barium should be used for the barium swallow; a thick mixture often requires much washing through a tube to remove the barium from the pouch. Quite often the fundus of the sac will be seen invading the superior mediastinum. Radiologically, the antero-posterior appearance of a barium-filled pouch can be simulated closely by a partial septum obstructing the commencement of the oesophagus. Therefore, if this mistake is to be avoided a semi-lateral view also must be taken. In this view the overflow of barium emulsion into the oesophagus often can be seen to come from the top of the pouch - not from the bottom, as is the case with an oesophageal web. X-ray of the chest may reveal aspiration pneumonitis.

**Oesophagoscopy or bouginage** is unnecessary for diagnosis, and may be dangerous. On many occasions the tip of the instrument has entered the pouch and has perforated its fundus, which is thin and fragile, and mediastinitis has resulted.

**Treatment.-** When the pouch is of a considerable size, operation is strongly advised, because progressive symptoms are inevitable. When emaciation is extreme a preliminary temporary 'feeding' gastrostomy or jejunostomy may be required.

The operation is performed in one stage. To prevent mediastinitis, antibiotics should be given before and after operation.

**Operation.-** Prior to skin preparation, the surgeon should inspect the pouch endoscopically, and gently pack it with ribbon gauze. At the same time a stomach tube is carefully passed into the oesophagus. These will act as helpful guides in determining the position of the sac during the dissection. The pouch is approached through either a transverse incision at the level of the cricoid cartilage, or, as many prefer, an oblique incision following the anterior border of the left sternomastoid. The first step is to mobilise the superior pole of

the lateral lobe of the thyroid gland, therefore it is necessary to ligate and divide the middle thyroid veins, and sometimes the inferior thyroid artery. The lateral lobe and thyroid cartilage are rotated forwards by means of a hook retractor placed under the posterior border of the thyroid lamina; this exposes the sac.

The walls of the sac vary in thickness; in some cases they are so thin that great care must be taken not to tear them. Having freed the pouch completely, a cuff of the outer layer of the pouch is dissected from the mucous membrane. This permits the closure of the neck of the sac, which must be performed very accurately in two layers. It is very important not to narrow the upper end of the oesophagus at the point where the pouch is removed. In all cases a cricopharyngeal myotomy dividing the hypertrophied circular muscle must be performed (cf Heller's operation, Chapter 43). The wound is closed with drainage.

**After-treatment.-** The patient is fed through an in-dwelling transnasal gastric tube for three days. Fluids only are permitted for the next three days. After this, semi-solids are given, and the diet is then increased gradually.

**Complications.-** 1. *Infection.*- Severe infection of the wound and the mediastinum is now infrequent. 2. *Pharyngeal Fistula.*- Usually the fistula closes spontaneously if the upper end of the oesophagus has not been narrowed.

### **Neoplasms of the Pharynx**

**Surgical Anatomy.-** Concerning neoplasms of the pharynx, the clinico-anatomical division into three component parts is of practical importance.

**The nasopharynx** (*syn* post-nasal space, epipharynx) is that portion of the pharynx lying above the level of the soft palate which forms its incomplete floor. With the exception of this floor, the nasopharynx has rigid, immovable walls. Each Eustachian tube opens into the antero-lateral wall of the nasopharynx just behind the posterior end of the inferior turbinate. Above and behind this orifice is a depression termed the supratonsillar fossa of Rosenmüller (Johann Christian Rosenmüller, 1771-1820. Professor of Anatomy and Surgery, Leipzig, Germany).

**The oropharynx** (*syn* the mesopharynx) extends from the inferior border of the soft palate to the lingual surface of the epiglottis. In the sulcus between the back of the tongue and the anterior (lingual) surface of the epiglottis lie a median glosso-epiglottic and a right and left pharyngo-epiglottic fold. The corresponding depression on either side of the glosso-epiglottic fold is known as the vallecula.

**The laryngopharynx** is the longest of the three division of the pharynx and it diminishes in width from above downwards, it extends from the tip of the epiglottis to the inferior border of the cricoid cartilage opposite the body of the sixth cervical vertebra, where it is continuous with the oesophagus. It is convenient to subdivide the laryngopharynx into (i) posterolateral pharyngeal walls, (ii) the pyriform fossae and (iii) the postcricoid region.

## Tumours of the Nasopharynx

### Benign

**Angio-fibroma.-** (Formerly called 'nasopharyngeal tumour', which ambiguous.) Although its local behaviour is the antithesis of benignity, this tumour is not malignant, for it never metastasises, neither does it infiltrate tissues. However, on account of its ability to send tentacles into first one and then the other nasal fossa, and thence into the accessory nasal sinuses, and above all because of its power to cause pressure necrosis of bone, it is a *highly destructive* tumour. As a result of these intrusions the tumour expands the nose, may fill the antra and in turn expand the cheek, and cause the palate to bulge, and at times invades the ethmoid and produces a 'frog face' appearance.

Nasopharyngeal angio-fibroma is a reddish, firm tumour covered with normal mucous membrane. Ulceration seldom occurs unless the tumour is traumatised. Histologically it is composed of immature fibroblasts and blood-vessels; in the early stages cavernous blood-vessels predominate. In long-standing cases fibrous tissue is more plentiful.

**Clinical Features.-** This tumour is almost confined to juvenile male patients.

Appearing at the age of puberty, the tumour usually regresses in the early twenties, provided that no secondary complications occur. Although nasopharyngeal angiofibroma is rare, when a boy present with progressive nasal obstruction, recurrent epistaxis, a purulent nasal discharge and a firm mass in the nasopharynx, this clinical entity should spring to mind.

**Investigation.-** CT scan will demonstrate the extent of the tumour. *Biopsy should be avoided* unless there are compelling reasons for undertaking it, when matched blood must be in readiness and the surgeon must be prepared to deal with haemorrhage.

**Treatment.-** Surgical resection requires an adequate exposure of the entire region, and although small localised tumours can be removed by the transpalatal approach, for more extensive tumours a transfacial or lateral rhinotomy gives a safer exposure allowing lateral ligation of the feeding maxillary artery.

**Operation.-** The transpalatal route is used. The tumour is excised with diathermy and the soft palate is replaced and sutured to the mucoperiosteum of the hard palate. Hypotensive anesthesia and cryosurgical techniques have facilitated the procedure. Alternatively, in order that early recurrence may be seen, and destroyed by diathermy, a permanent palatal fenestra can be made. The fenestra is closed by an obturator attached to a denture. The patient can then talk and eat quite normally.

**A choanal polypus** may give rise to difficulty in differential diagnosis. Aetiologically it belongs to nasal polypi, originating either in the ethmoid region or in the maxillary antrum. If large, it may descend through the posterior nares into the nasopharynx and present behind the soft palate. A choanal polypus may be distinguishing from angiofibroma by its mobility due to the long pedicle by which it is attached, avascularity and an elastic rather than firm consistency. It can be easily removed with a snare, although the corresponding sinus may have to be opened for complete removal.



## Malignant

In China, Japan and Malaysia malignant tumours are more common in the nasopharynx than in any other part of the body save the cervix uteri, a possible cause being the use of smoky kerosene lamps in these countries. The majority are carcinomas (70%), followed by lymphoma (15%), lympho-epithelioma (10%) (A tumour containing many lymphoid elements in addition to carcinomatous elements.), while the remainder include mixed salivary tumour. Fifty per cent of these growths arise in the lateral wall of the nasopharynx, mostly in the supratonsillar fossa of Rosenmüller; the remainder are divided equally between the roof and the posterior wall.

**Clinical Features.-** These depend mainly on whether the growth is obstructive (lymphoma), or infiltrating (carcinoma). Usually the *first* symptoms for which advice is sought fall into four groups:

1. *The Nasal Group.-* Slight, intermittent epistaxis and nasal speech are early nasal symptoms; other nasal symptoms, *viz*, a feeling of obstruction to the airway and a post-nasal discharge, usually are delayed.

2. *Aural Group.-* Unilateral deafness, with pain in the ear, is the usual complaint. Obstruction of the pharyngeal orifice of the Eustachian tube by a growth leads to a collection of sero-sanguineous fluid within the middle ear. The deafness that results is relieved by paracentesis of the tympanic membrane and suction, but a fresh accumulation soon occurs. Bleeding on Eustachian catheterisation is a sign of the utmost importance.

3. *Enlarged Cervical Lymph Nodes.-* By the time the diagnosis is established, 70% of patients with a malignant tumour of the nasopharynx have enlarged cervical lymph nodes, and 40% present on account of the cervical swelling. The swelling is in the upper jugular chain and the nodes are firm, rather than hard, and may be mistaken for tuberculous adenitis.

Unlike carcinoma of the tongue, metastases more distant than the neck occur eventually in about a quarter of cases.

4. *Cranial Nerve Involvement.-* In Far Eastern patients this is the most common presenting symptom; in British patients 30% have some cranial nerve involvement when first seen. All suffer implication by the growth either at their exit through their respective foramina at the base of the skull, or, less frequently, by intracranial extension of the growth. Pain of trigeminal distribution is an important feature in this group. X-ray of the base of the skull may show destruction of bone by the tumour, but it is not unusual for patients to develop root pains without x-ray changes.

*Trotter's Triad (Wilfred Batten Lewis Trotter, 1872-1939. Professor of Surgery, University College Hospital, London).-* The three cardinal symptoms of a locally invasive tumour can be summarised as follows: (i) Conductive deafness, (ii) Elevation and immobility of the homolateral soft palate - due to direct infiltration. (iii) Pain in the side of the head - due to involvement of the fifth cranial nerve from infiltration via the foramen lacerum.

**Biopsy** is necessary to ascertain the histological characteristics of the tumour. Inspection of the nasopharynx is facilitated if a soft rubber catheter is passed through the nose, and withdrawn through the mouth. Gentle traction displaces and immobilises the soft palate, and thereby an uninterrupted view is obtained. If more detailed inspection is desirable. Wilson's approach (Charles Paul Wilson, 1900-1970. Surgeon, Ear, Nose and Throat Department, Middlesex Hospital, London.) through the junction of the hard and soft palate should be used.

**Treatment.-** Present practice favours supervoltage external irradiation, given to the primary tumour and to the lymph node fields on both sides of the neck at least as far down as the clavicles. Lymphoma, undifferentiated carcinoma, and lymph-epithelioma are very radio-sensitive. If the primary responds satisfactorily, it is feasible to perform a cervical block dissection of the enlarged lymph nodes.

**Prognosis.-** Owing to their secluded position and consequent late diagnosis, and the inaccessibility of the nasopharynx, the prognosis is poor. The five-year survival rate is about 40% for the lymphoma group and under 20% in the case of carcinoma.

## Neoplasms of the Oropharynx

### Benign

**Diffuse cavernous angioma** involving the pharynx, fauces, and often extending into the neck (where it forms a swelling) has been treated successfully by injecting into the bluish mass in the pharynx 0.5 mL of 1.4 solution of ferrous chloride in sterile water. The injected area immediately turn bright red, remains swollen for a few days, and then cicatrizes. Further injections may be required. Later, if necessary, abnormal tissue is removed by diathermy, with practically no bleeding. Cryosurgery can be effective in dealing with these lesions.

### Malignant

Usually carcinoma of the oropharynx is of the ulcerative type. The commonest site of origin is the tonsillo-lingual sulcus. There is discomfort at the back of the throat, foetor, and blood-stained sputum. Pain is absent until the growth is far advanced.

**Treatment.-** The management is identical to tumours of the nasopharynx of similar histological picture.

**Operation.-** Although the long-term results are far from good, when possible, extirpation of the growth and the regional lymph nodes holds out a better prospect of success than irradiation.

**Lateral pharyngotomy with partial pharyngectomy** is performed as follows. A tracheostomy is usually performed as the first step. Then a block dissection of the cervical and retropharyngeal lymph nodes is carried out. The lateral lobe of the thyroid is then mobilised and displaced forwards. The inferior constrictor muscle is detached from the thyroid and cricoid cartilages. The great cornu of the hyoid bone and the posterior two-thirds of the ala of the thyroid cartilage are removed without opening the mucous lining.

Should the growth be situated on the lateral wall and have invaded the tonsillar region, the cervical operation is halted at this stage, and through the widely open mouth an incision is made at least 2.5 cm distant from the accessible margins of the neoplasm with a diathermy knife, the internal carotid artery being held aside in the neck (Raven) (Ronald William Raven, Contemporary Consulting Surgeon, The Royal Marsden Hospital, London.). Returning to the neck, the pharynx is opened longitudinally and that portion of the pharyngeal wall containing the growth and a wide margin of healthy tissue is removed in continuity with its lymphatics.

*When the loss of the pharyngeal wall is not great* the pharynx is closed. A portion of the upper part of the posterior skin flap is anchored by stitches to the prevertebral fascia, thus providing free exit to infected matter should leakage occur. The remainder of the cervical wound is closed with drainage at its lower end.

After-treatment includes transnasal intragastric feeding and antibiotic therapy.

*When it is known beforehand that the defect in the pharyngeal wall is likely to be a large one*, the operation is performed through a rectangular skin flap, and after partial pharyngectomy has been performed, the first stage of the plastic procedure is carried out. In the early post-operative period, the patient is fed by a tube passed into the stomach through the fistula.

In both the procedures just described the resulting cervical fistula will require closure; this is undertaken after a short convalescence.

Growths situated in the vallecula, unless very advanced, must be treated by pharyngolaryngectomy with, if necessary, excision of a portion of the back of the tongue.

### **Neoplasms of the Laryngopharynx**

In accordance with their site of origin, it is customary to subdivide malignant tumours of this part of the pharynx into four groups:

**1. Epilaryngeal (20%).**- Nearly always the patient is a man between fifty and sixty years of age. The lesion is situated on an aryepiglottic fold, extending to the epiglottis or the corresponding arytenoid cartilage, and is either of the ulcerative or the papillary type. It may be symptomless in the early stages. The earliest symptom is a slightly sore throat. A muffled voice and increasing dysphagia occur later. Real hoarseness indicates involvement of the interior of the larynx, *ie*, the vocal cord. Later there are attacks of dyspnoea associated with blood-stained sputum. The diagnosis is made by indirect laryngoscopy.

**2. Sinus Piriformis** (Piriformis - Latin, *pirum* = pear.)- Again, this group occurs chiefly in men about fifty years of age, and the lesion is notoriously silent. Often its first intimation is an enlarged lymph node behind the angle of the jaw. Frequently this is not heeded in its early stages. Exceptionally, the patient presents himself at an earlier stage, because of slight difficulty in swallowing saliva, as opposed to food. Pain is absent until the growth has involved the superior laryngeal nerve. The pain is referred to the ear. Carcinoma of the piriform fossa is nearly always of the ulcerative type. The growth may be seen with

a laryngeal mirror, but sometimes its extent cannot be determined without direct laryngoscopy.

**3. Lateral Wall (12%).**- Once again men are attacked much more often than women. Contrary to the sinus piriformis, the growth is often papillary.

A lateral radiograph of the neck, with air inflation of the pharynx, is often more informative than a barium swallow in the demonstration of a neoplasm in this and nearby situations.

**4. Post cricoid (28%)** occurs on the anterior wall of the hypopharynx at the level of the cricoid cartilage. The patient is nearly always a woman of over forty years of age, who gives a history of increasing dysphagia.

The higher incidence in women is possibly due to their ability to swallow hotter fluids and food than men can tolerate. Many of these neoplasms are secondary to the Plummer-Vinson syndrome (Also widely known as the Paterson-Brown-Kelly syndrome.). Indirect laryngoscopy seldom reveals the growth, which lies hidden beneath a pool of mucus. Radiographic examination after a barium swallow is often helpful in determining the site of the lesion. Direct pharyngoscopy is the most informative, and allows a portion of the growth to be removed for biopsy. (Henry Stanley Plummer, 1874-1937. Physician, Mayo Clinic, Rochester, Minnesota, USA. Porter Paisley Vinson, 1890-1959. Physician, Mayo Clinic, Rochester, Minnesota, USA. Donald Rose Paterson, 1862-1939. Surgeon, Ear, Nose and Throat Department, Royal Infirmary, Cardiff, Wales. Adam Brown Kelly, 1865-1941. Surgeon, Ear, Nose and Throat Department, Victoria Infirmary, Glasgow, Scotland.)

**Treatment of Carcinoma of the Laryngopharynx.**- The condition is notoriously difficult to treat successfully. Surgery, often the treatment of choice, involves the major operation of laryngo-pharyngectomy, combined with block dissection of the neck, the establishment of a permanent tracheostomy, and the plastic reconstruction of the pharynx. About 20% of patients survive five years.

External irradiation is the alternative method of treatment and is advised for those patients who are considered unsuitable for such a major procedure, either because of their poor general condition, or because it is thought that they will not be able to adjust themselves to a life without a larynx.

*Types of Operation.*- Operations which combine excision and reconstruction of the gullet in one stage are preferable to staged procedures. The following is an example of a one-stage operation, in which the stomach is used to replace the pharynx:

Two teams are used. The first team performs the pharyngo-laryngectomy, the block dissection of the lymph nodes of the neck on the side of the tumour, and establishes the tracheostomy. The larynx and pharynx are excised from above the level of the hyoid bone down to the level of the third or fourth tracheal ring, and including the whole of the cervical oesophagus. The stump of the oesophagus is closed by inverting sutures and allowed to slide into the thorax. The thyroid gland is included in the excision. A block dissection of lymph

nodes on the less involved side may be undertaken, but the sternomastoid muscle and the internal jugular vein are usually spared.

*Stomach pull-up.*- At the same time as the larynx, pharynx and oesophagus are mobilised in the neck, the stomach is mobilised via a left upper paramedian incision. The left gastric artery is divided, but the blood supply from the marginal branch of the right gastro-epiploic artery is preserved when the omentum is freed from the greater curvature of the stomach. A pyloromyotomy is necessary to allow adequate drainage. The oesophagus is then mobilised in the posterior mediastinum by blunt finger dissection from both the upper and lower ends with especial care to prevent damage to the posterior wall of the trachea. The stomach is then pulled up through the posterior mediastinum by gentle traction on the oesophagus which is then resected and the fundus of the stomach is anastomosed to the pharyngeal stump. A large suction drain is placed in the chest, but the bleeding from the azygos veins is controlled by pressure from the bulk of the stomach.

The patient is allowed to swallow fluids the following day and to eat normal foods within two weeks. Should recurrence of the neoplasm occur, radiotherapy can be given with little risk of damage to the artificial gullet and hence little interference with the patient's swallowing.

### **Chemotherapy**

Cytotoxic drugs have a limited value as an adjunct to surgery and radiotherapy in patients who have not responded, or who have recurrent growths. Before deciding to give chemotherapy, one must balance the prognosis of the disease against the expected relief and possible toxic side-effects and then consider the types of agent required and the most suitable method of administration. The regimen to follow has been discussed in Chapter 32 and Chapter 10.

### **Cryosurgery**

Cryosurgery (The idea of 'freezing surgery' is not new; a Dr James Arnott in 1851 at the Middlesex Hospital described the beneficial effects of a salt-ice mixture at  $-20^{\circ}\text{C}$  in the treatment of various superficial cancers. James Moncrieff Arnott, 1794-1885. Surgeon, Middlesex Hospital, London.) is a technique in which tissues are exposed to extreme cold in order to produce irreversible cell damage. Alternate rapid freezing and thawing to a temperature of at least  $-10^{\circ}\text{C}$  causes multiple intra-cellular ice crystals to form which will be lethal to the cell. Its main use in appropriately trained hands would seem to be, 1. destruction of benign vascular lesions of the head and neck (*eg*, haemangioma, angiofibroma), 2. palliation and relief of pain in uncontrolled or recurrent accessible cancers (*eg*, carcinoma of nasopharynx), 3. a large number of ophthalmological procedures, including fixation of detached retina.

*Technique.*- Modern equipment consists of a hollow probe refrigerated by liquid nitrogen or pressurised nitrous oxide. Incorporated in the probe is a rewarming device, thus tissue can be rapidly frozen and thawed as required. The probe is applied to the tissue and freezing started, and when a 'tissue ice-ball' has formed in the area to be treated, it is then

immediately allowed to thaw. The process must be repeated 2 or 3 times to achieve maximum destruction.