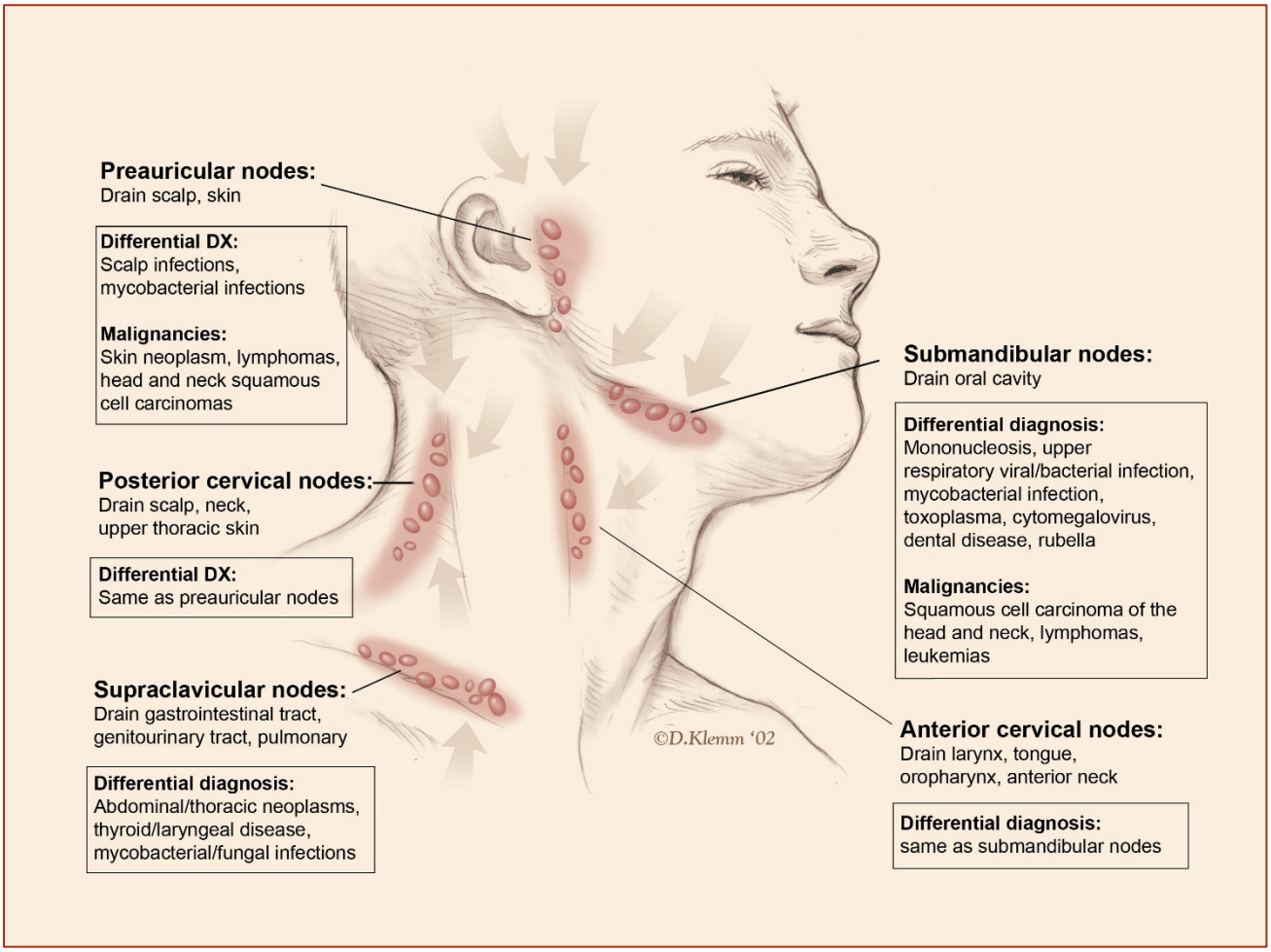


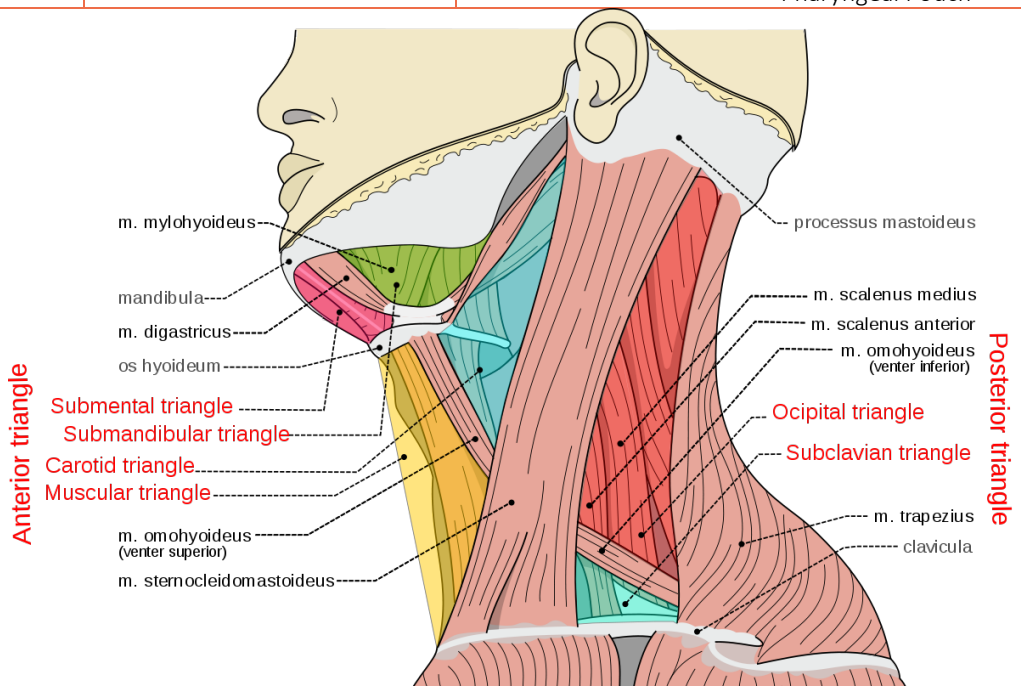
Neck lumps

Reactive lymphadenopathy	By far the most common cause of neck swellings. There may be a history of local infection or a generalised viral illness
Lymphoma	Rubbery, painless lymphadenopathy The phenomenon of pain whilst drinking alcohol is very uncommon There may be associated night sweats and splenomegaly
Thyroid swelling *(midline)*	May be hypo-, eu- or hyperthyroid symptomatically Moves upwards on swallowing
Thyroglossal cyst *(midline)*	More common in patients < 20 years old Usually midline, between the isthmus of the thyroid and the hyoid bone Moves upwards with protrusion of the tongue. May be painful if infected. ℞ Sistrunk procedure (excision of cyst + associated track).
Pharyngeal pouch *(Ant|Post Δ)*	More common in older men Represents a posteromedial herniation between thyropharyngeus and cricopharyngeus muscles Usually not seen, but if large then a midline lump in the neck that gurgles on palpation Typical symptoms are dysphagia, regurgitation, aspiration and chronic cough
Cystic hygroma *(Post Δ)*	A congenital lymphatic lesion (lymphangioma) typically found in the neck, classically on the left side Most are evident at birth, around 90% present **before 2 years of age**
Branchial cyst *(Ant Δ)*	An oval, mobile cystic mass that develops between the sternocleidomastoid muscle and the pharynx Develop due to failure of obliteration of the second branchial cleft in embryonic development Usually present in **early adulthood**, rare above the age of 40 At risk excision: Mandibular branch of facial nerve, greater auricular nerve and accessory nerve.
Cervical rib *(Post Δ)*	More common in adult females Around 10% develop thoracic outlet syndrome
Carotid aneurysm	Pulsatile lateral neck mass which doesn't move on swallowing
Carotid body tumour *(Ant Δ)*	Typically present as painless masses. They may compress the vagus or hypoglossal nerves with symptoms attributable to these structures. Over 90% occur spontaneously and are more common in people living at **high altitude**. In familial cases up to 30% may be bilateral. ℞ is with excision.

Neck Masses in Children

Thyroglossal cyst *(midline)*	• Located in the anterior triangle, usually in the midline and below the hyoid (65% cases) • Derived from remnants of the thyroglossal duct • Thin walled and anechoic on USS (echogenicity suggests infection of cyst)
Branchial cyst *(Ant Δ)*	• Six branchial arches separated by branchial clefts • Incomplete obliteration of the branchial apparatus may result in cysts, sinuses or fistulae • 75% of branchial cysts originate from the second branchial cleft • Usually located anterior to the sternocleidomastoid near the angle of the mandible • Unless infected the fluid of the cyst has a similar consistency to water and is anechoic on USS
Dermoids *(midline)* *(superficial)*	• Derived from pleuripotent stem cells and are located in the midline • Most commonly in a suprahyoid location • They have heterogeneous appearances on imaging and contain variable amounts of calcium and fat
Thyroid gland	• True thyroid lesions are rare in children and usually represent thyroglossal cysts or tumours like lymphoma
Lymphatic malformations	• Usually located posterior to the sternocleidomastoid • Cystic hygroma result from occlusion of lymphatic channels • The painless, fluid filled, lesions usually present prior to the age of 2 • They are often closely linked to surrounding structures and surgical removal is difficult • They are typically hypoechoic on USS
Infantile haemangioma *(Ant|Post Δ)*	• May present in either triangle of the neck • Grow rapidly initially and then will often spontaneously regress • Plain x-rays will show a mass lesion, usually containing calcified phleboliths • As involution occurs the fat content of the lesions increases
Lymphadenopathy *(Ant|Post Δ)*	• Located in either triangle of the neck • May be reactive or neoplastic • Generalised lymphadenopathy usually secondary to infection in children (very common)

Superficial Structures	Midline structures	Lateral Structures	
		Anterior triangle	Posterior triangle
Sebaceous cyst	Thyroglossal cysts	Branchial cyst	Cystic Hygroma
Lipoma	Thyroid swelling	Thyroid lobe swellings	
Abscess	Chondroma of thyroid cartilage	Submandibular lymph gland pathology	Cervical rib
	Submental lymph nodes	Lymphadenopathy	
Dermoid cyst	Dermoid cyst	Parotid gland swelling	
	Laryngeal swelling	Laryngocoele	Torticollis
		Carotid body tumour	
		Carotid artery aneurysm	Subclavian aneurysm
		Infantile Hemangioma	
		Pharyngeal Pouch	



Submandibular glands disease

The submandibular glands secrete approximately **800- 1000ml** saliva per day. They typically produce mixed seromucinous secretions. When parasympathetic activity is dominant; the secretions will be more serous.
The **parasympathetic** fibres are derived from the **chorda tympani** nerves and the submandibular ganglion.
Sensory fibres are conveyed by the **lingual branch** of the mandibular nerve (V_3).

Salivary Glands
- Parotid
- Sublingual
- Submandibular

Sialolithiasis
- 80% of all salivary gland calculi occur in the submandibular gland
- 70% of the calculi are radio-opaque
- Stones are usually composed of calcium phosphate or calcium carbonate
- Patients typically develop colicky pain and post prandial swelling of the gland
- Investigation involves sialography to demonstrate the site of obstruction and associated other stones
- Stones impacted in the distal aspect of **Wharton's** duct may be removed orally, other stones and chronic inflammation will usually require gland excision

Sialadenitis *(inflammation of a salivary gland)*
- Usually occurs as a result of *Staphylococcus aureus* infection
- Pus may be seen leaking from the duct, erythema may also be noted
- Development of a sub mandibular abscess is a serious complication as it may spread through the other deep fascial spaces and occlude the airway

Submandibular tumours
- Only 8% of salivary gland tumours affect the sub mandibular gland
- Of these 50% are malignant (usually adenoid cystic carcinoma)
- Diagnosis usually involves fine needle aspiration cytology
- Imaging is with CT and MRI
- In view of the high prevalence of malignancy, **all masses of the submandibular glands should generally be excised.**

Parotid gland clinical

Benign neoplasms

Up to 80% of all salivary gland tumours occur in the parotid gland and up to 80% of these are benign. There is no consistent correlation between the rate of growth and the malignant potential of the lesion. However, benign tumours should not invade structures such as the facial nerve.

With the exception of Warthins tumours, they are commoner in women than men. The median age of developing a lesion is in the 5th decade of life.

Benign tumour types

Tumour type	Features
Benign pleomorphic adenoma (Benign mixed tumor)	**Most common** parotid neoplasm (80%) Proliferation of epithelial and myoepithelial cells of the ducts and an increase in stromal components (**classic biphasic** histological appearance) **Slow growing**, lobular, and not well encapsulated Recurrence rate of 1-5% with appropriate excision (**parotidectomy**) Recurrence possibly secondary to capsular disruption during surgery Malignant degeneration occurring in 2-10% of adenomas observed for long periods, with carcinoma ex-pleomorphic adenoma occurring most frequently as adenocarcinoma
Warthin tumor (Papillary cystadenoma lymphoma) (Adenolymphoma)	Second most common benign parotid tumor (5%) **Most common bilateral** benign neoplasm of the parotid Marked male as compared to female predominance Occurs **later in life** (sixth and seventh decades), **smokers**. Presents as a lymphocytic infiltrate and cystic epithelial proliferation May represent heterotopic salivary gland epithelial tissue trapped within intraparotid lymph nodes Incidence of bilaterality and multicentricity of 10% Malignant **transformation rare** (almost unheard of)
Monomorphic adenoma	Account for less than 5% of tumours Slow growing Consist of only one morphological cell type (hence term mono) Include; basal cell adenoma, canalicular adenoma, oncocytoma, myoepitheliomas
Haemangioma	Should be considered in the differential of a parotid mass in a child Accounts for 90% of parotid tumours in **children less than 1 year of age** Hypervascular on imaging Spontaneous regression may occur and malignant transformation is almost unheard of

Malignant salivary gland tumours

Types of malignancy

Mucoepidermoid carcinoma	30% of all parotid malignancies Usually low potential for local invasiveness and metastasis (depends mainly on grade)
Adenoid cystic carcinoma	Unpredictable growth pattern Tendency for **perineural spread** Nerve growth may display skip lesions resulting in incomplete excision Distant metastasis more common (visceral rather than nodal spread) 5 year survival 35%
Mixed tumours	Often a malignancy occurring in a previously benign parotid lesion
Acinic cell carcinoma	Intermediate grade malignancy May show perineural invasion Low potential for distant metastasis 5 year survival 80%
Adenocarcinoma	Develops from secretory portion of gland Risk of regional nodal and distant metastasis 5 year survival depends upon stage at presentation, may be up to 75% with small lesions with no nodal involvement
Lymphoma	Large rubbery lesion, may occur in association with Warthins tumours Diagnosis should be based on regional nodal biopsy rather than parotid resection Treatment is with chemotherapy (and radiotherapy)

Diagnostic evaluation

- Plain x-rays may be used to exclude calculi
- Sialography may be used to delineate ductal anatomy
- FNAC is used in most cases
- Superficial parotidectomy may be either diagnostic of therapeutic depending upon the nature of the lesion
- Where malignancy is suspected the primary approach should be definitive resection rather than excisional biopsy
- CT/ MRI may be used in cases of malignancy for staging primary disease

Treatment

For nearly all lesions this consists of surgical resection, for benign disease this will usually consist of a superficial parotidectomy. For malignant disease a radical or extended radical parotidectomy is performed. The facial nerve is included in the resection if involved. The need for neck dissection is determined by the potential for nodal involvement.

Other parotid disorders

HIV infection

- Lymphoepithelial cysts associated with HIV occur almost exclusively in the parotid
- Typically presents as bilateral, multicystic, symmetrical swelling
- Risk of malignant transformation is low and management usually conservative

Sjogren syndrome

- Autoimmune disorder characterised by parotid enlargement, xerostomia and **keratoconjunctivitis sicca**
- 90% of cases occur in females
- Second most common connective tissue disorder
- Bilateral, non-tender enlargement of the gland is usual
- Maybe **secondary** (for e.g. RA)
- Histologically, the usual findings are of a lymphocytic infiltrate in acinar units and epimyoepithelial islands surrounded by lymphoid stroma
- Treatment is supportive
- There is an increased risk of subsequent lymphoma

Sarcoid

- Parotid involvement occurs in 6% of patients with sarcoid
- Bilateral in most cases
- Gland is not tender
- Xerostomia may occur
- **Facial nerve** palsy
- Management of isolated parotid disease is usually conservative, **improvement with steroid.**

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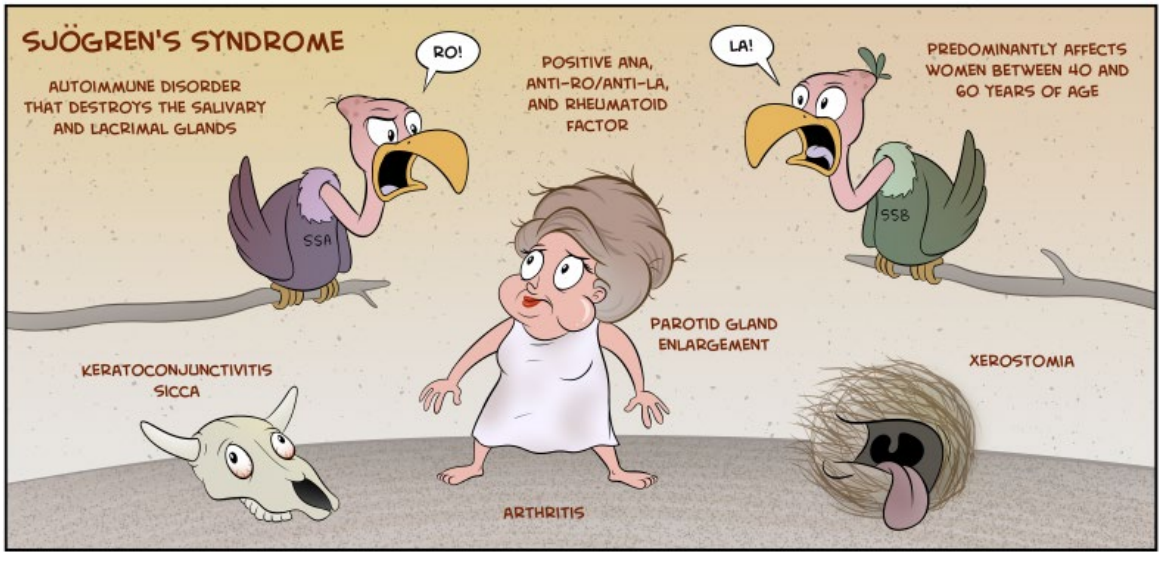


Diseases of nose and sinuses

Benign Tumours

- Simple papillomas may be an incidental finding or present with obstructive symptoms. Excision under general anaesthesia is sufficient management.
- Transitional cell papillomas may be more extensive and produce obstructive symptoms. Erosion of local structures is a recognised complication. These lesions may rarely undergo malignant transformation and therefore careful and complete excision is required, some cases may require partial or total maxillectomy.
- Pleomorphic adenomas of the maxillary sinuses are reported but are extremely rare, their symptoms typically include nasal obstruction and pain if the sinus is obstructed. Treatment is by complete surgical excision, the diagnosis is not infrequently made post operatively.
- Benign osteomas may develop in the paranasal sinuses, the frontal sinus is the most frequent location of such lesions. Symptoms include; pain, rhinorrhoea and anosmia. Most osteomas may be observed if asymptomatic, sphenoid osteomas should be resected soon after diagnosis as enlargement may compromise visual fields. Many sinus osteomas can now be resected endoscopically, complete surgical resection is required.
- Nasal polyps are benign lesions of the ethmoid sinus mucosa. Many patients may also have **asthma**, **cystic fibrosis** and a **sensitivity to aspirin**. Symptoms include **watery rhinorrhoea, infection and anosmia**. The polyps are usually a semitransparent grey mass. They are rare in childhood. Treatment is either with systemic steroids or surgical resection. The latter should be combined with antral washout. Low dose, nasal, steroid drops may reduce the risk of recurrence.

Malignant disease

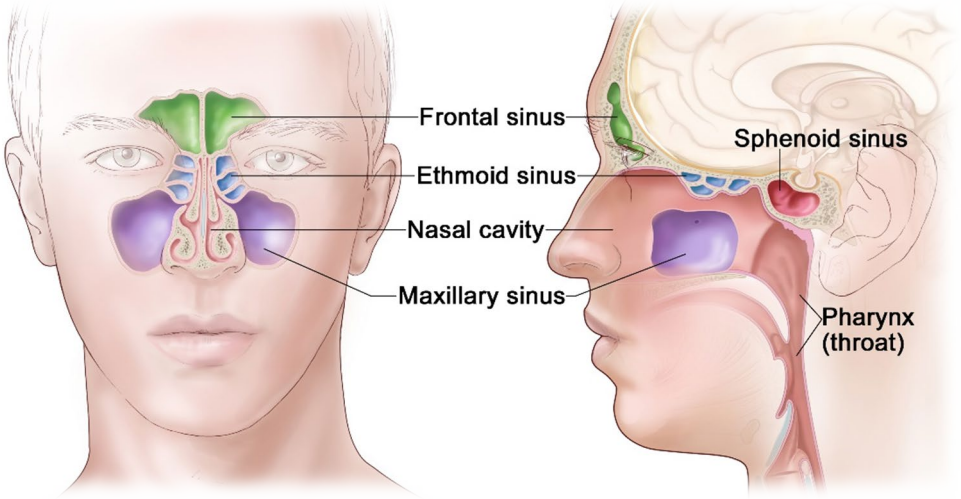
- Malignancies encountered in the nose and paranasal sinuses include; adenoid cystic carcinoma, squamous cell carcinoma and adenocarcinoma.
- Adenocarcinoma of the paranasal sinuses and nasopharynx is strongly linked to **exposure to hard wood dust** (after >10 years exposure).
- Adenoid cystic carcinoma usually originate in the smaller salivary glands.
- The majority of cancers (50%) arise from the lateral nasal wall, a smaller number (33%) arise from the maxillary antrum, ethmoid and sphenoid cancers comprise only 7%.
- Signs of malignancy on clinical examination include loose teeth, cranial nerve palsies and lymphadenopathy.
- Nasopharyngeal cancers are most common in individuals presenting from China and **Asia** and are linked to viral infection with **Epstein Barr Virus**. Radiotherapy and chemotherapy are the most commonly used modalities.

Maxillary sinusitis

- Common symptoms include post nasal discharge, pain, headache and toothache.
- Imaging may show a fluid level in the antrum.
- Common organisms include *Haemophilus influenzae* or *Streptococcus pneumoniae*.
- Treatment with antral lavage may facilitate diagnosis and relieve symptoms. Antimicrobial therapy has to be continued for long periods. Antrostomy may be needed.

Frontoethmoidal sinusitis

- Usually presents with frontal headache, nasal obstruction and altered sense of smell.
- Inflammation may progress to involve periorbital tissues. Ocular symptoms may occur and secondary CNS involvement brought about by infection entering via emissary veins.
- CT scanning is the imaging modality of choice. Early cases may be managed with antibiotics. More severe cases usually require surgical drainage.



Epistaxis

Usually trivial and insignificant but severe haemorrhage may compromise airway and pose a risk to life.

Arterial supply

- From internal and external carotid
- An arterial plexus exists at Little's area and is the source of bleeding in 90% cases
- Major arterial supply is from the sphenopalatine and greater palatine arteries (branches of the maxillary artery)
- The facial artery supplies the more anterior aspect of the nose
- Ethmoidal arteries are branches of the ophthalmic artery. They supply the posterosuperior nasal cavity

Venous drainage follows the arterial pattern

Classification

- Primary idiopathic epistaxis accounts for 75% of all cases
- Secondary cases arise as a result of events such as anticoagulants, trauma and coagulopathy
- Classification into anterior and posterior epistaxis may help to locate the source and becomes more important when invasive treatment is required

Management

- Resuscitate if required
- Subject should sit upright and pinch nose firmly
- Nasal cavity should be examined using a headlight
- Simple anterior epistaxis may be managed using silver nitrate cautery. If difficult to manage then custom manufactured packs may be inserted
- Posterior packing or tamponade may be achieved by passing a balloon tamponade device and inflating it. This is indicated where anterior packing alone has failed to achieve haemostasis.
- Post nasal pack patients should receive antibiotics
- Failure of these methods will require more invasive therapy. Where a vascular radiology suite is available, consideration may be given to angiographic techniques. Direct ligation of the nasal arterial supply may also be undertaken. Of the arterial ligation techniques available, the endo nasal sphenopalatine arterial ligation procedure is most popular.

Voice production

There are 2 main nerves involved:

Superior laryngeal nerve (SLN) (External laryngeal nerve *"motor"* and Internal laryngeal nerve *"sensory"*)

Innervates the cricothyroid muscle

Since the cricothyroid muscle is involved in adjusting the tension of the vocal fold for high notes during singing, SLN paresis and paralysis result in:

- Abnormalities in pitch
- Inability to sing with smooth change to each higher note (glissando or pitch glide)

Recurrent laryngeal nerve (RLN) (Inferior laryngeal nerve)

Innervates intrinsic larynx muscles

- Opening vocal folds (as in breathing, coughing)
- Closing vocal folds for vocal fold vibration during voice use
- Closing vocal folds during swallowing

Injury of RLN

- *Unilateral:* diplophonia, dysphagia
- *Bilateral:*
    - *Partial:* Respiratory compromise
    - *Complete:* Aphonia

Disorders affecting the ear

Variant	Cause	Features	Treatment
Acute otitis externa	Boil in external auditory meatus	Acute pain on moving the pinna Conductive hearing loss if lesion is large When rupture occurs pus will flow from ear	Ear packs may be used Topical antibiotics Operative debridement may be needed in severe cases
Chronic otitis externa	Chronic combined infection in the external auditory meatus usually combined staphylococcal and fungal infection	Chronic discharge from affected ear, hearing loss and severe pain rare	Cleansing of the external ear and treatment with antifungal and antibacterial ear drops

Malignant otitis externa

- Uncommon type of otitis externa that is found in immunocompromised individuals (90% in diabetics)
- Infective organism is usually *Pseudomonas aeruginosa*
- Infection commences in the soft tissues of the external auditory meatus, then progresses to involve the soft tissues and into the bony ear canal
- Progresses to temporal bone osteomyelitis

Treatment

- Anti pseudomonal antimicrobial agents
- Topical agents
- Hyperbaric oxygen is sometimes used in refractory cases

Key features in history

- **DM** (90%) or immunosuppression (illness or treatment related)
- Severe, unrelenting, deep-seated **otalgia**
- Temporal headaches
- Purulent otorrhea

Possibly dysphagia, hoarseness, and/or **facial nerve** dysfunction

Otitis media

Variant	Cause	Features	Treatment
Acute suppurative otitis media	Viral induced middle ear effusions secondary to eustachian tube dysfunction	• Most common in children and rare in adults • May present with symptoms elsewhere (e.g. vomiting) in children • Severe pain and sometimes fever • May present with discharge is tympanic rupture occurs	Antibiotics (usually amoxicillin)
Chronic suppurative otitis media	• May occur with or without cholesteatoma • Those without cholesteatoma have a perforation of the pars tensa • Those with cholesteatoma have a perforation of the pars flaccida	• Those without cholesteatoma may complain of intermittent discharge (non-offensive) • **Those with cholesteatoma have impaired hearing and foul smelling discharge**	• Simple pars tensa perforations may be managed non operatively or a myringoplasty considered if symptoms troublesome. • Pars flaccida perforations will usually require a radical mastoidectomy

Otosclerosis

- Progressive conductive deafness
- Secondary to fixation of the stapes in the oval window
- Treatment is with stapedectomy and insertion of a prosthesis

Acoustic neuroma

- Symptoms of gradually progressive unilateral perceptive deafness and tinnitus
- Involvement of the vestibular nerve may cause vertigo
- Extension to involve the facial nerve may cause weakness and then paralysis.

Pre auricular sinus

- Common congenital condition in which an epithelial defect forms around the external ear
- Small sinuses require no treatment
- Deeper sinuses may become blocked and develop episodes of infection, they may be closely related to the facial nerve and are challenging to excise