PHARYNX

NAME THE DIFFERENT TYPES OF TONSILS. DESCRIBE PALATINE TONSILS UNDER THE FOLLOWING HEADINGS- POSITION, BLOOD SUPPLY, RELATIONS, MICROSCOPIC ANATOMY, DEVELOPMENT, APPLIED ANATOMY(LE)

Tonsils are secondary lymphoid organs.

The different types of tonsils are

- Pharyngeal tonsil
- tubal tonsil
- Palatine tonsil
- Lingual tonsil

These tonsils are aggregations of lymphoid tissue constituting the Waldeyer`s lymphatic ring. They are present in relation to the oropharyngeal isthmus.

Palatine tonsil

Position-

The palatine tonsil occupies the tonsillar fossa of the lateral wall of oropharynx between the palatoglossal and palatopharyngeal arches .

The boundaries of tonsillar fossa are

Anterior

Palatoglossal arch containing palatoglossal muscle

Posterior

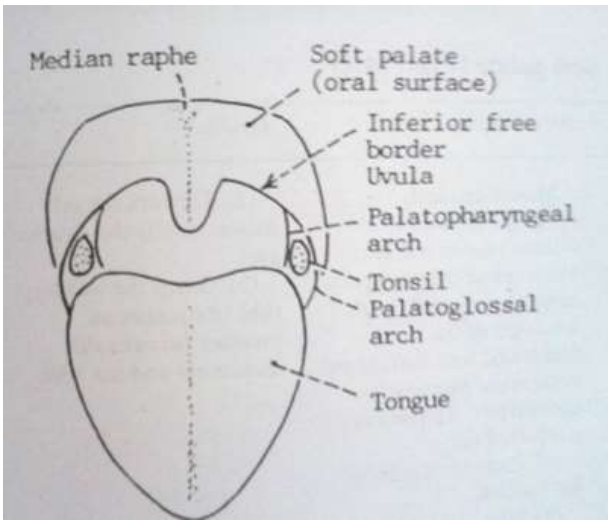
Palatopharyngeal arch containing palatpharyngeus muscle

Apex

Soft palate

Base

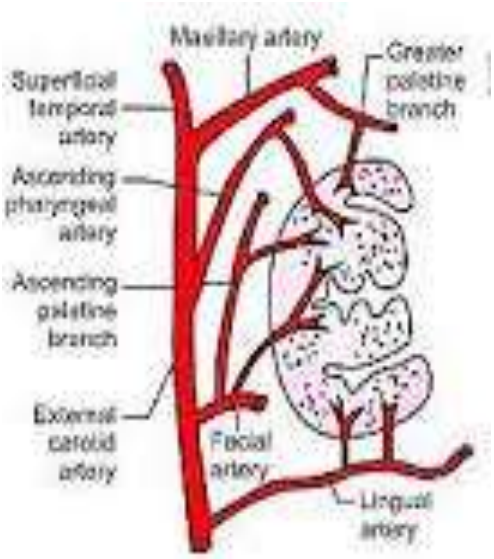
Dorsal surface of posterior 1/3 tongue



Blood supply

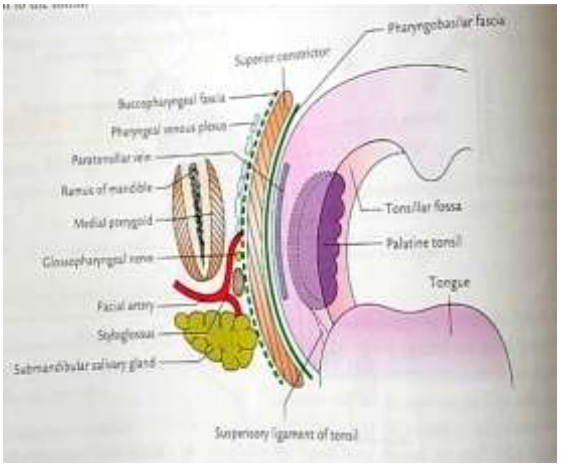
The following arteries supply the tonsil;-

Tonsillar branch of facial artery – main source
Ascending palatine branch of facial artery
Dorsal lingual branches of lingual artery
Ascending pharyngeal branch of external carotid artery
Greater palatine branch of maxillary artery



The veins from the tonsil drain into paratonsillar vein and join palatine, pharyngeal or facial veins

Relations



Tonsil has

Two surfaces - medial and lateral
Two borders – anterior and posterior
Two poles – upper and lower

Medial surface

Is free and bulges into the oropharynx. A number of crypts are present on this surface.

Lateral surface

Is covered by a sheet of fascia which forms the capsule of tonsil
Deep to the capsule is loose areolar tissue with paratonsillar vein.
The **bed of the tonsil (** lateral to capsule) is formed from within outwards by
Pharyngobasilar fascia
Superior constrictor
Buccopharyngeal fascia
Styloglossus
Glossopharyngeal nerve

Anterior border

palatoglossal arch

Posterior border

palatopharyngeal arch

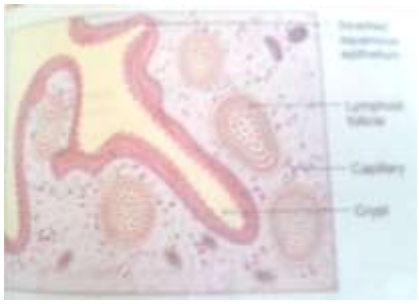
Upper pole

soft palate

Lower pole

posterior 1/3rd of tongue

Microscopic anatomy



The oral aspect of tonsil is lined by stratified squamous nonkeratinised epithelium which dips into the underlying tissue to form crypts. The lymphocytes present in the tonsil form nodules. The structure of tonsil is not differentiated into cortex and medulla.

Development

The epithelium of the tonsil develops from the ventral part of 2 nd pharyngeal pouch
The lymphocytes develop from mesoderm.

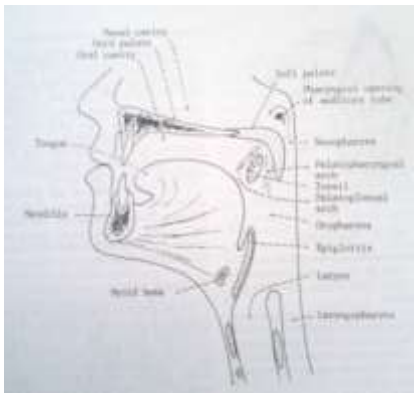
Applied anatomy

Acute tonsillitis- tonsils are frequent sites of infection in children

Peritonsillar abcess- tonsillar infection spreading to the surrounding tissues causes this abcess

Tonsillectomy- surgical removal of tonsils.

NASOPHARYNX (SE)



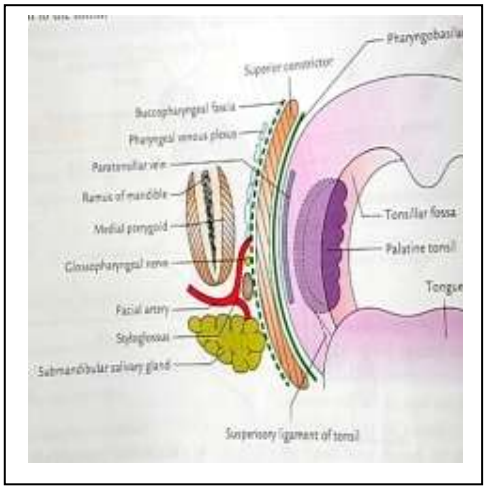
It is situated behind the nose and extends from the base of the skull (body of sphenoid) to soft palate.
It communicates anteriorly with the nasal cavity and inferiorly with oropharynx.
Pharyngeal isthmus is an opening bounded anteriorly by soft palate and posteriorly by posterior wall of pharynx (**Passavant`s ridge**).

The features seen are

Nasopharyngeal tonsil (pharyngeal) tonsil – is a collection of lymphoid tissue at the junction of roof and posterior wall of pharynx
Opening of auditory tube
Tubal tonsil – is a collection of lymphoid tissue in the tubal elevation (the upper and posterior margins of auditory tube are bound by tubal elevation)
Pharyngeal recess/ fossa of rosenmuller - is a depression behind the tubal elevation

Nasopharynx is respiratory in function and lined by pseudostratified ciliated columnar epithelium.

PALATINE TONSIL- RELATIONS, BLOOD SUPPLY AND APPLIED ANATOMY(SE)



Relations

Tonsil has

Two surfaces- medial and lateral
Two borders – anterior and posterior
Two poles – upper and lower

Medial surface

Is free and bulges into the oropharynx.
A number of crypts are present on this surface.

Lateral surface

Is covered by a sheet of fascia which forms the capsule of tonsil

Deep to the capsule is loose areolar tissue with paratonsillar vein.

The **bed of the tonsil** is formed from within outwards by

Pharyngobasilar fascia
Superior constrictor and palatopharyngeus muscle
Buccpharyngeal fascia
Styloglossus in the lower part
Glossopharyngeal nerve

Anterior border- palatoglossal arch

Posterior border- palatopharyngeal arch

Upper pole- soft palate
Lower pole- tongue

Blood supply

The following arteries supply the tonsil

Tonsillar branch of facial artery – main source
palatine branch of facial artery
Dorsal lingual branches of lingual artery
Ascending pharyngeal bransh of external carotid artery
Greater palatine branch of maxillary artery

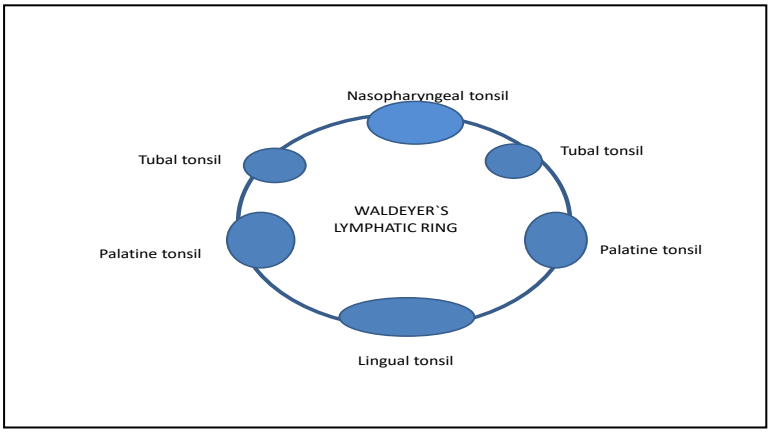
The veins from the tonsil drain into paratonsillar vein and join palatine , pharyngeal or facial veins

Applied anatomy

Acute tonsillitis- Tonsils are frequent sites of infection in children.
Peritonsillar abcess- Tonsillar infection spreading to the surrounding tissues causes this abcess
Tonsillectomy- is surgical removal of tonsils.

STRUCTURES FORMING WALDEYERS LYMPHATIC RING (SA)

The Waldeyer`s ring is formed by lymphoid tissue aggregations around the beginning of pharynx.
There are two paired and two unpaired tonsils which constitute the Waldeyer's ring.
Posterosuperiorly- Pharyngeal tonsil (unpaired)
Posterolaterally- pair of tubal tonsils which are present around the terminal part of auditory tube
Inferiorly- posterior part of tongue- Lingual tonsil (unpaired)
Inferolaterally - pair of palatine tonsils present between the palatoglossal and palatopharyngeal arches



OPENINGS IN NASOPHARYNX (SA)

Medial end of auditory tube opens into the lateral wall of nasopharynx at the level of inferior nasal concha. It is guarded by aggregation of lymphoid tissue called tubal tonsil.

Nasopharynx communicates anteriorly with nasal cavity.

Inferiorly it communicates with oropharynx where there is a constriction called the nasopharyngeal isthmus.

Pharyngeal isthmus is an opening bounded anteriorly by soft palate and posteriorly by posterior wall of pharynx (**Passavant`s ridge**).

BLOOD SUPPLY AND LYMPHATIC DRAINAGE OF TONSIL (SA)

Arterial supply

The palatine tonsils are supplied by external carotid artery and its branches

- Tonsillar branch of facial artery – main source
- Ascending palatine branch of facial artery
- Dorsal lingual branches of lingual artery
- Ascending pharyngeal branch of external carotid artery
- Greater palatine branch of maxillary artery

Venous drainage

The veins from the tonsil drain into paratonsillar vein and join palatine , pharyngeal or facial veins

Lymphatic drainage

Lymphatics from tonsil drain into jugulodigastric lymph nodes.

RETROPHARYNGEAL SPACE (SA)

It is a potential space situated behind the pharynx.

Boundaries

It is bounded anteriorly by the buccopharyngeal fascia which covers the constrictor muscles of pharynx behind it is bounded by the prevertebral fascia

Extent

Extends from base of skull above to bifurcation of trachea below.

Contents

This space consists of loose areolar tissue and lymph nodes.

Applied anatomy

Lymph nodes may get inflamed and form retropharyngeal abcess.

The pus may extend into three areas-

- The mediastinum,
- Go around the carotid sheath and present as a swelling on the posterior border of sternomastoid.
- May project as a paramedian swelling in the pharynx.

INFERIOR CONSTRICTOR. (SE)

It consists of two parts.

- Thyropharyngeus
- cricopharyngeus

Origin:

Thyropharyngeus arises from the obligue line and inferior horn of thyroid cartilage.

Cricopharyngeus arises from anterior arch of cricoid cartilage.

Insertion:

The fibres of thyropharyngeus are inserted into median raphe.

The fibres of cricopharyngeus are horizontal in direction,surround the upper end of oesophagus and are continuous with the similar fibres of opposite muscle without interruption by the median raphe.

The junction between the thyropharyngeus and cricopharyngeus is weakest part of pharynx and is known as the dehiscence of Killian.

Nerve supply:

The thyropharyngeus part is supplied by cranial part of accessory nerve through pharyngeal plexus.

The cricopharyngeal part by recurrent laryngeal nerve.

Action:

The thyroparyngeus is propulsive in function.

The cricopharyngeus acts as a sphincter and is normally kept closed except in deglutition.

Applied aspect:

In neuromuscular in-coordination when both part contract simultaneously the interpharyngeal pressure rises and the mucous membrane of the pharynx bulges through the dehiscence forming pharyngeal diverticulum.

This diverticulum may grow progressively downward dorsal to and usually along the left side of oesophagus,and produce dysphagia.

Structures passing between the middle and inferior constrictor muscle (SA)

Internal laryngeal nerve which is a branch of vagus nerve

Superior laryngeal vessels.

Structures passing below the inferior constrictor (SA)

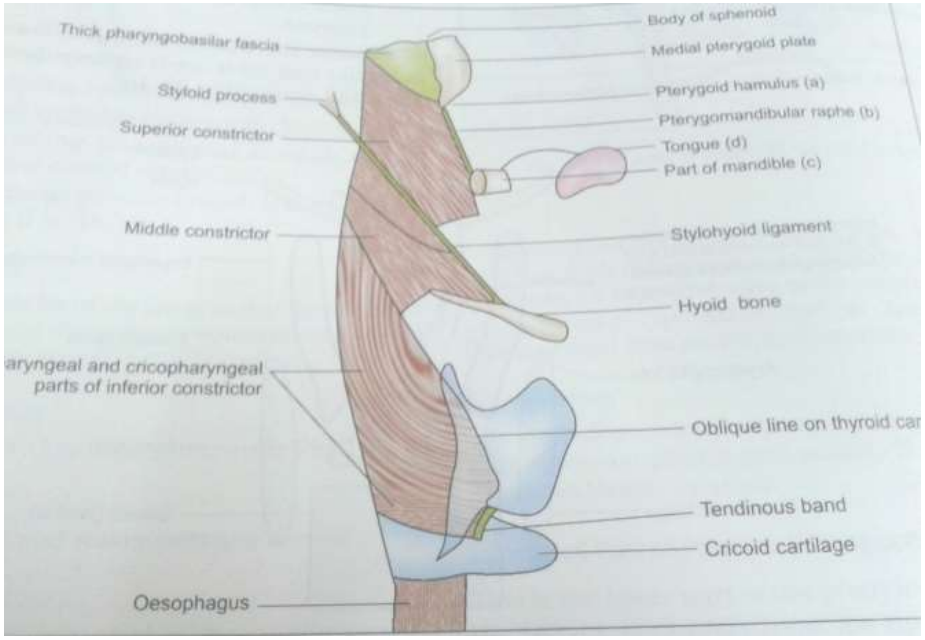
Recurrent laryngeal nerve which is a branch of vagus nerve

Inferior laryngeal vessels.

PHARYNX

NAME THE MUSCLES OF PHARYNX. GIVE (A)ORIGIN, (B)INSERTION,(C)NERVE SUPPLY,(D)ACTIONS,(E)RELATIONS OF SUPERIOR CONSTRICTOR MUSCLE OF PHARYNX. ADD A NOTE ON ITS SURGICAL ANATOMY (LE)

Muscles of Pharynx



Circular muscles:-

Superior constrictors,
Middle constrictors,
Inferior constrictors,

The three constrictors are so arranged that the inferior overlaps the middle, which inturn overlaps the superior.

Longitudinal muscles:-

Stylopharyngeus,
Palatopharyngeus
Salpingopharyngeus

Superior constrictor muscle of pharynx.

Origin

-the lower part of the posterior border of medial pterygoid plate.
-Petrygoid hamulus,
-Petrygomandibular raphe,
-The posterior end of mylohyoid line of mandible,
-Side of the tongue.

Insertion

-pharyngeal tubercle,
-fibrous raphe
-median pharyngeal raphe.

Nerve Supply

pharyngeal plexus formed by vagus, glossopharyngeal and cranial part of accessory nerve and sympathetic fibers.

Actions

contract reflexly during deglutition and induce peristalsis.

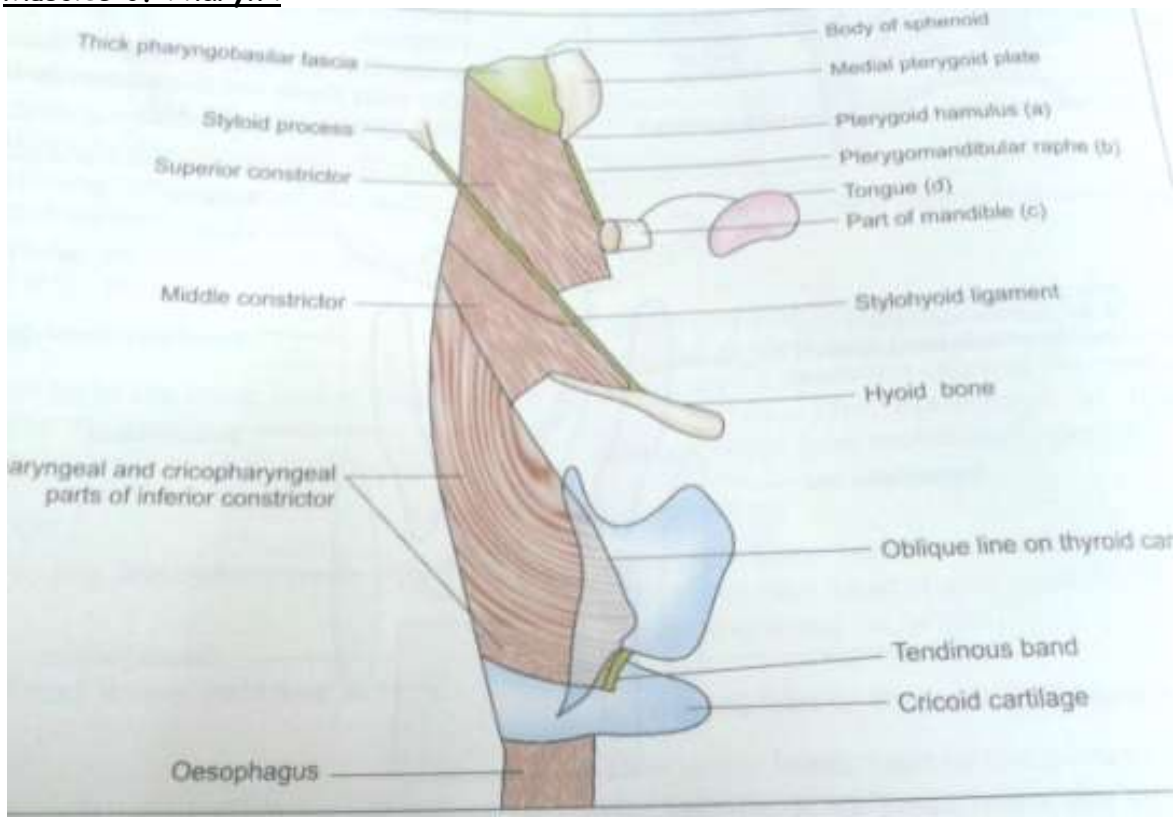
Relations

Surgical anatomy.

pressure of food in the weak area of Killians dehiscence can produce a diverticulum of the pharynx which grows downwards,it can press the oesophagus and can cause dysphagia.

MUSCLES OF PHARYNX. (SE)

Muscles of Pharynx



Circular muscles:-

Superior constrictors
Middle constrictors
Inferior constrictors,

Longitudinal muscles:-

Stylopharyngeus,
Palatopharyngeus
Salpingopharyngeus

Circular muscles

Superior constrictor muscle of pharynx.

Origin

Petrygoid hamulus,
Petrygomandibular raphe,
The posterior end of mylohyoid line of mandible,

Insertion

pharyngeal tubercle,
medianpharyngeal raphe.

Nerve supply

pharyngeal plexus formed by vagus, glossopharyngeal ,cranial part of accessory nerve and sympathetic fibers.

Actions.

contract reflexly during deglutition and induce peristalsis

Middle constrictor muscle

Origin

lesser cornu of hyoid
upper border of greater cornu of hyoid

Insertion

median fibrous raphe

Nerve Supply

pharyngeal plexus

Inferior constrictor muscle - there are two parts of this muscle.

Origin

thyropharyngeus- oblique line and inferior horn ofthyroid cartilage
cricopharyngeus-cricoid cartilage

Insertion

median raphe

Nerve Supply

pharyngeal plexus

Actions.

Thyropharyngeas-contracts reflexly during deglutition and induce peristalsis
Cricopharyngeus- acts as a sphincter

Longitudinal muscles

Stylopharngeus.

Origin:

medial surface of the base of styloid process.

Palatopharyngeus.

Origin:

by two fasiculi from the upper surface of palatine aponeurosis.

Salpingopharyngeus

Origin:

lower part of the cartilage of the auditory tube

Insertion

- All the longitudinal muscles are inserted to posterior border of lamina of thyroid cartilage.

Nerve supply:

cranial root of accessory nerve through pharyngeal nerve plexus.

Action

Elevation of larynx and shortening of pharynx during swallowing

CONSTRICTORS OF PHARYNX (SE)

Circular muscles:-

Superior constrictors,

Middle constrictors,

Inferior constrictors.

Superior constrictor muscle of pharynx.

(a)origin

Petrygoid hamulus,

Petrygomandibular raphe,

The posterior end of mylohyoid line of mandible,

(b)insertion

pharyngeal tubercle,

medianpharyngeal raphe.

(c)nerve supply

pharyngeal plexus formed by vagus,glossopharyngeal & cranial part of accessory nerve and sympathetic fibers.

(d)Actions.

contract reflexly during deglutition and induce peristalsis

Middle constrictor muscle

Origin

a.lower part of stylohyoid ligament

b. lesser cornu of hyoid

c.upper border of greater cornu of hyoid

insertion

-median fibrous raphe

Inferior constrictor muscle

origin

-thyropharyngeus-oblique line on lamina of thyroid cartilage

-tendinous band between thyroid tubercle and cricoid cartilage

-cricopharyngeus-cricoid cartilage

Insertion

median raphe posteriorly.

nerve supply

pharyngeal plexus formed by vagus,glossopharyngeal & cranial part of accessory nerve and sympathetic fibers.

Actions.

- contract reflexly during deglutition and induce peristalsis

INFERIOR CONSTRICTOR OF PHARYNX. (SE)

There are two parts of this muscle – Thyropharyngeus & Cricopharyngeus

Origin

thyropharyngeus- oblique line and inferior horn ofthyroid cartilage

cricopharyngeus-cricoid cartilage

I Insertion

median raphe

Nerve supply

pharyngeal plexus

Actions

Thyropharyngeas- contracts reflexly during deglutition and induce peristalsis

Cricopharyngeus- acts as a sphincter

Applied Anatomy

The junction between thyropharygeus and cricopharyngeus is the weakest part of pharynx, is known as Killan's dehiscence. The pressure of food in this area can produce the diverticulum of the pharynx which grows downwards. it can press the oesophagus and can cause dysphagia

KILLIANS DEHISCENCE. (SA)

The junction between thyropharygeus and cricopharyngeus is the weakest part of pharynx ,is known as killans dehiscence.The area above the dehiscence is reinforced by all the three constrictor muscles but below the dehiscence is formed only by the cricopharyngeus.

Lies below the level of vocal folds or upper border of cricoid lamina.

The pressure of food in this area can produce the diverticulum of the pharynx which grows downwards,it can press the oesophagus and can cause dysphagia.

Pharyngeal diverticula is due to neuro muscular incoordination in this region,because of different nerve supply of thyropharygeus and cricopharyngeus.

INFERIOR CONSTRICTOR MUSCLE OF PHARYNX-NERVE SUPPLY AND ACTION.(SA)

Nerve supply

pharyngeal plexus formed by vagus, glossopharyngeal & cranial part of accessory nerve and sympathetic fibers.

Actions.

Thyropharyngeas- contracts reflexly during deglutition and induce peristalsis
Cricopharyngeus- acts as a sphincter