GROSS ANATOMY OF SPLEEN & TONSILLS

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LYMPHOID TISSUE

1. Primary – Thymus
   - Bone marrow

} Generate lymphocytes from Immature progenitor cells

2. Secondary - lymph nodes,
   lymphoid follicles in tonsils,
   Peyer's patches,
   spleen,
   adenoids,
   skin, etc.

3. Tertiary - Distributed groups
   of lymphocytes

INTRODUCTION

- It is a haemo-lymph organ and belongs to reticulo-endothelial system.
- 2nd lymphoid organ
- Pleural cavity separates spleen and diaphragm from the rib.

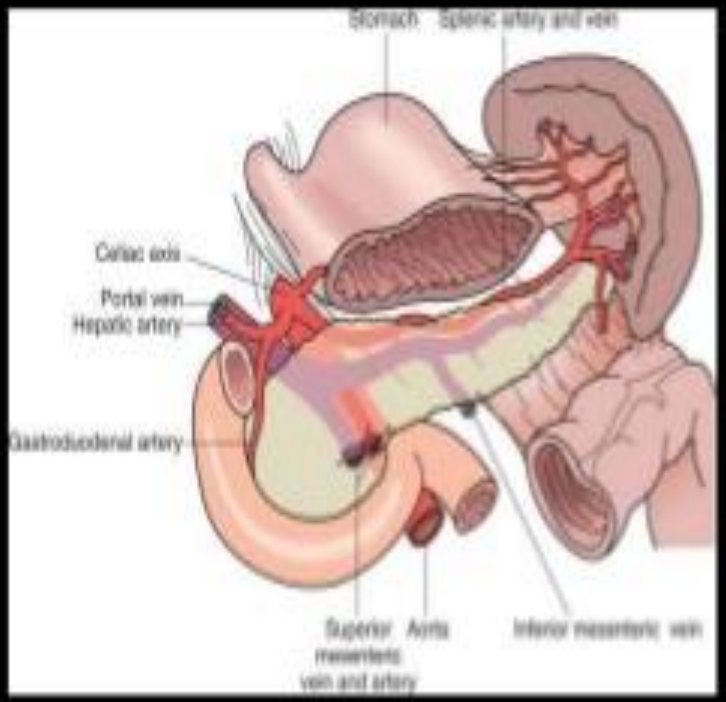
FUNCTIONS

- Spleen forms parts of the reticuloendotelial system.
- Main function is hematopoiesis in fetal life and in adults with reutilization of iron from hemoglobin of destroyed red blood cells.
- Its has red and the white pulp, which are separated by the marginal sinus.

- Red pulp composed sinuses, splenic cord and marginal zone and main function to filter red blood cells and reserve monocytes.

- White pulp is composed of malpighian corpuscles and help in active immune response.

Development



Develops from mesenchymal cells in the dorsal mesogastrium during the fifth week of gestation.

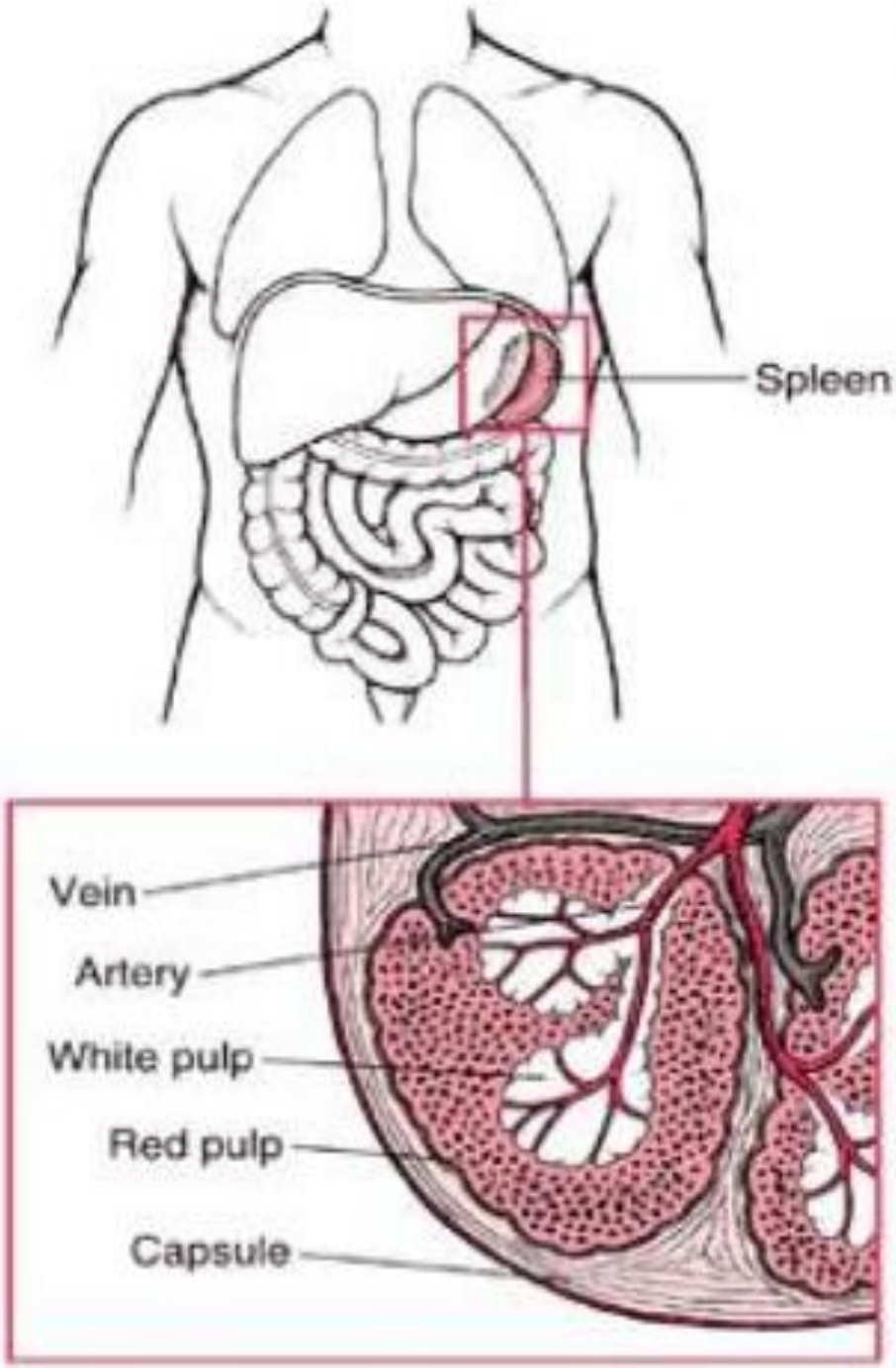
- Number of nodules develop which soon fuse to form a lobulated spleen.
- Notching of superior border of adult spleen is evidence of its multiple origin.
- These nodules which fail to fuse,form **accessory spleens**.

POSITION OF SPLEEN

Lies between fundus of stomach and diaphragm.

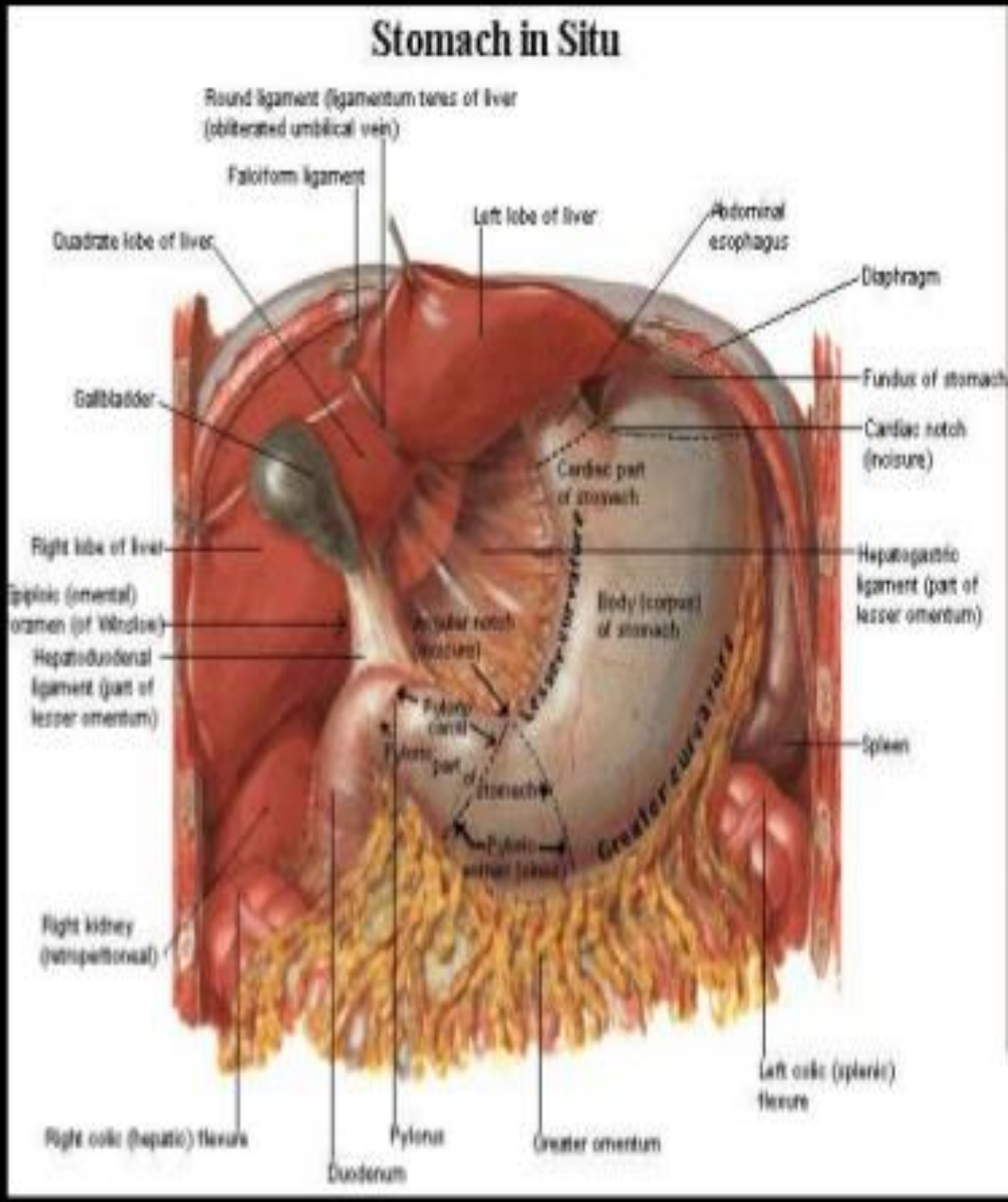
Lies in lt hypochondrium and epigastrium.

Extends in between 9th to 11th ribs.



Axis of spleen is directed downwards, forwards and laterally.

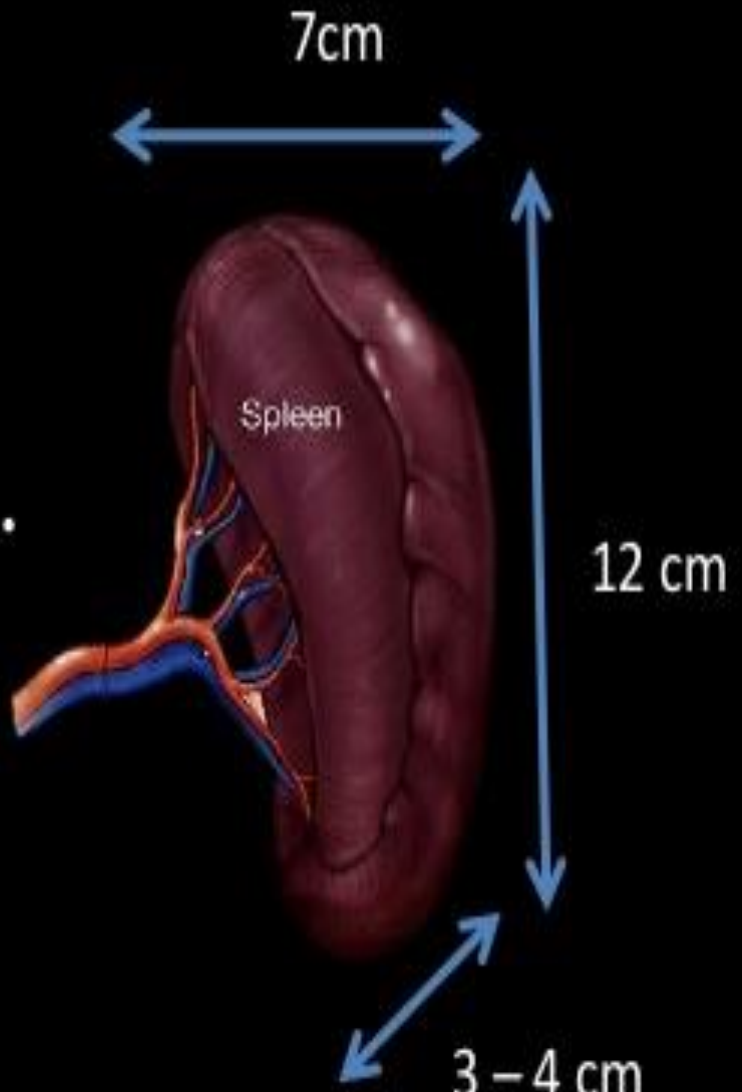
Axis lies along the 10th rib.



MEASURMENTS OF SPLEEN

- Length-12 cm(5 inch)
- Breadth-7cm(3 inch)
- Thickness-3cm (1inch)
- Weight-150gm(7 oz)
- HARRIR'S DICTUM OF ODD NUMBERS ON SPLEEN:1,3,5,7,9,11
- 1inches in thikness,3 inches in breadth,5 inches in length,7oz in weight,9-11 ribs of left side against which spleen rest.

150 gr.
(80 -300 gr).



The
peritoneum
covering the
spleen, except in
the hilum.

EXTERNAL FEATURES

- The spleen has :-
- Two ends
- Three borders
- Two surfaces
- Two angles
- Hilum

TWO ENDS

The anterior or lateral end:-it is expanded or more like a border.it is directed downwards ,forwards and reaches mid axillary line.

- **The posterior or medial end**:- it is rounded and directed upwards backwards, medially,and rest on upper pole of left kidney.

TWO BORDERS

- **Superior border :-** presents one or two notches near anterior end.
- Notches indicate spleen is lobulated in development.

- **Inferior border:-** it is rounded

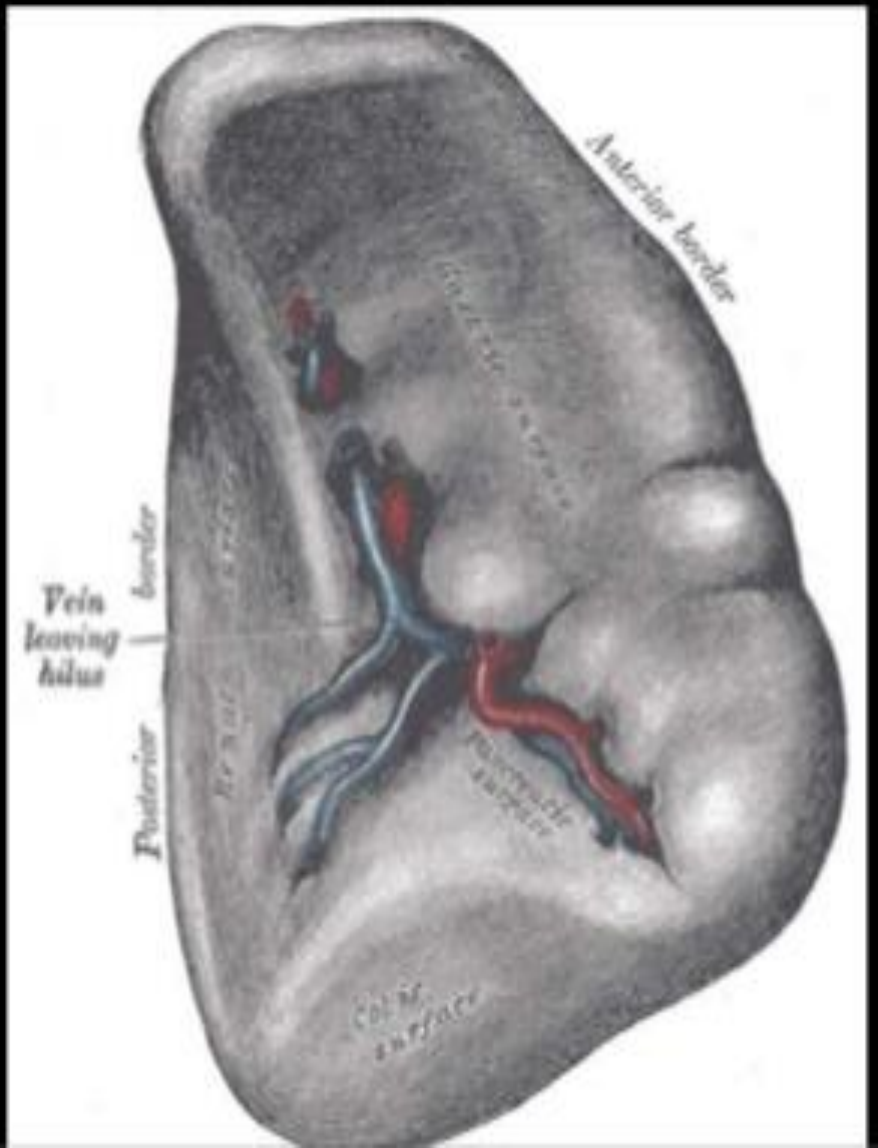
SURFACES

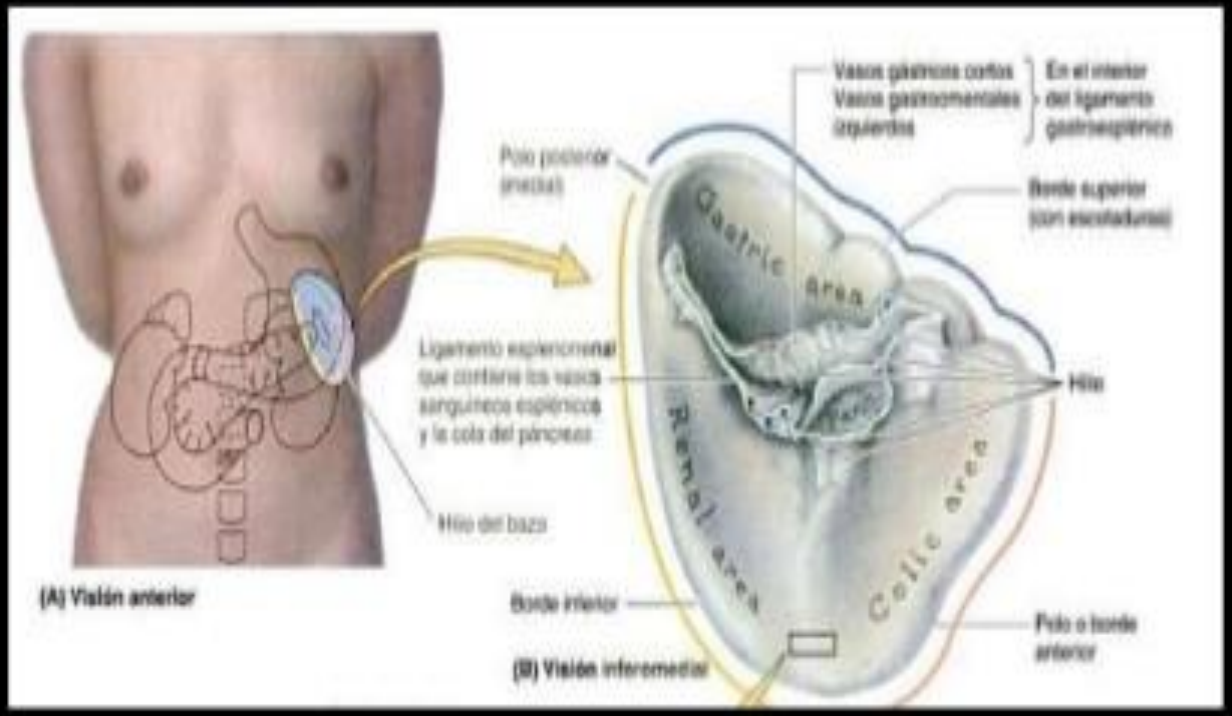
- DIAPHRAGMATIC :- This surface is convex and smooth.
- IT IS RELATED TO:-
- A) Diaphragm
- B) Lt lung & Its pleura
- C) Costodiaphragmatic recess
- d) 9th, 10th & 11th ribs of left side.

- VISCERAL SURFACE:- It is concave and irregular.
- IT IS RELATED TO:-
- FUNDUS OF STOMACH
- ANTERIOR SURFACE OF LEFT KIDNEY
- THE SPLENIC FLEXURE OF COLON
- TAIL OF PANCREAS

IMPRESSIONS ON VISCERAL SURFACE

- Gastric impression
- Renal impression
- Colic impression
- Pancreatic impression (Tail)



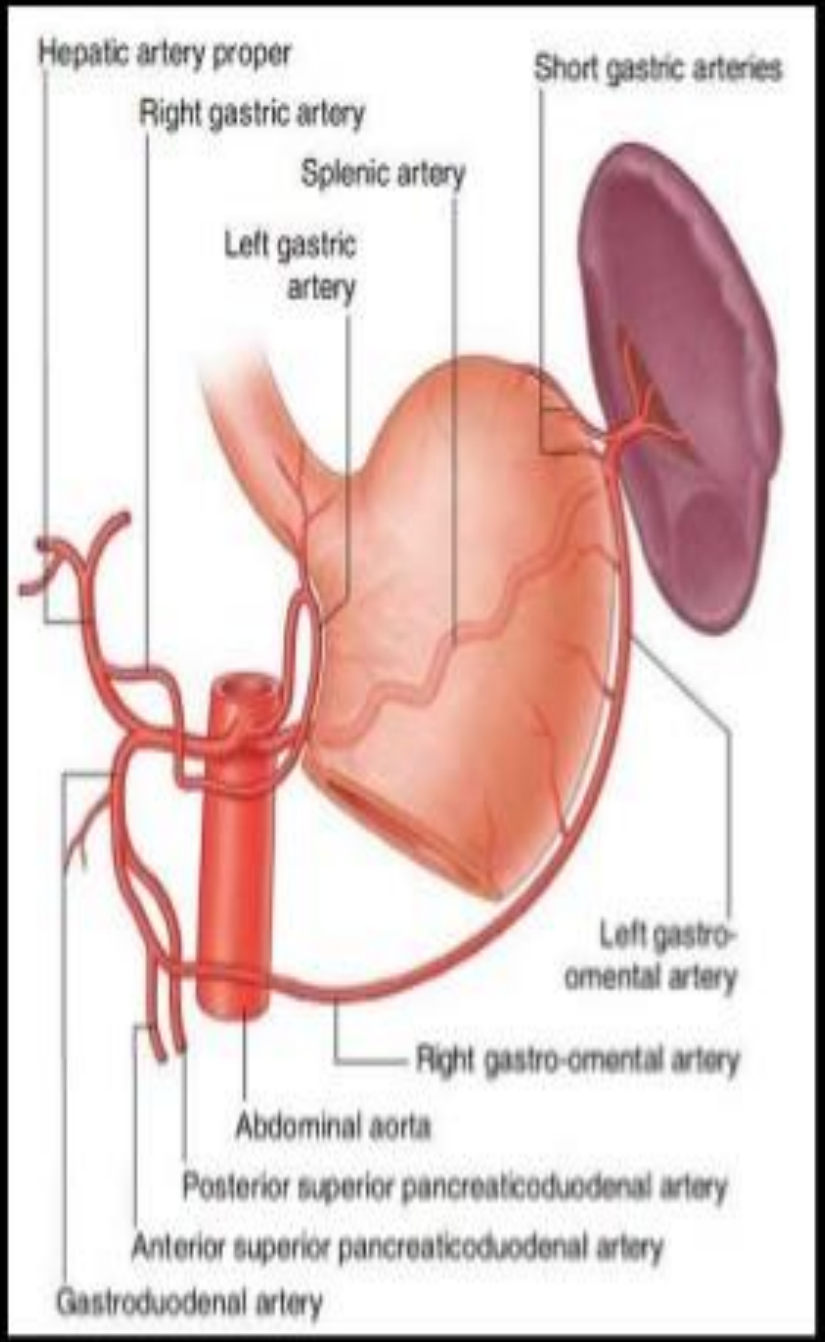


Ligaments

- Gastro-splenic
- Lieno-renal
- Lieno-phrenic
- Phrenico-colic

Blood Supply

- The tortuous splenic artery arises from the coeliac trunk and runs along the upper border of the body and tail of the pancreas, to which it gives small branches.
- The short gastric and left gastroepiploic branches pass between the layers of the gastrosplenic ligament.
- The main splenic artery generally divides into superior and inferior branches, which, in turn, subdivide into several segmental branches.


Hepatic artery proper
Right gastric artery
Splenic artery
Left gastric artery
Short gastric arteries
Left gastro-omental artery
Right gastro-omental artery
Abdominal aorta
Posterior superior pancreaticoduodenal artery
Anterior superior pancreaticoduodenal artery
Gastroduodenal artery

VENOUS DRAINAGE

- Splenic Vein: Drains into portal vein.

NERVE SUPPLY

- It is predominentaly supplied by the sympathetics from coeliac plexus.The fibers supply the blood vessels and smooth muscle of trabeculae

CLINICAL IMPORTANCE

- Spleen is undercover of thoracic cage and is not palpable

- **Splenomegaly** : enlarged spleen due to cancer, specifically blood-based leukemia.

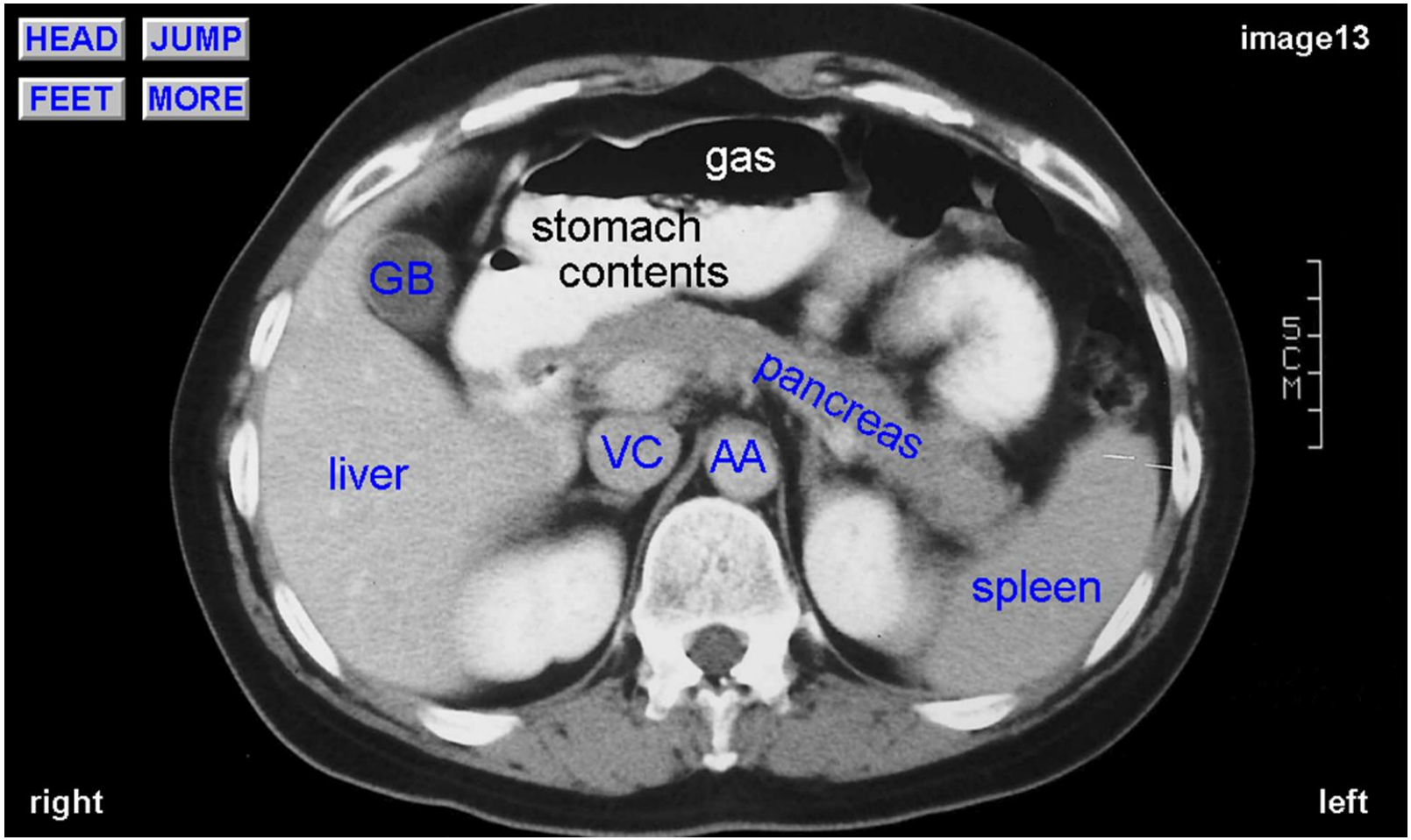
- **Asplenia** : where the spleen is not present.

- **Hyposplenia**: reduce splenic functions..

EPIDIMIOLOGY

- Spleen is the most commonly injured organ in blunt abdominal trauma..
- Accounting for approx 40 % of all solid organ injuries.
- Occurs in 25 % in left renal trauma.
- 45 % wid hepatic trauma.

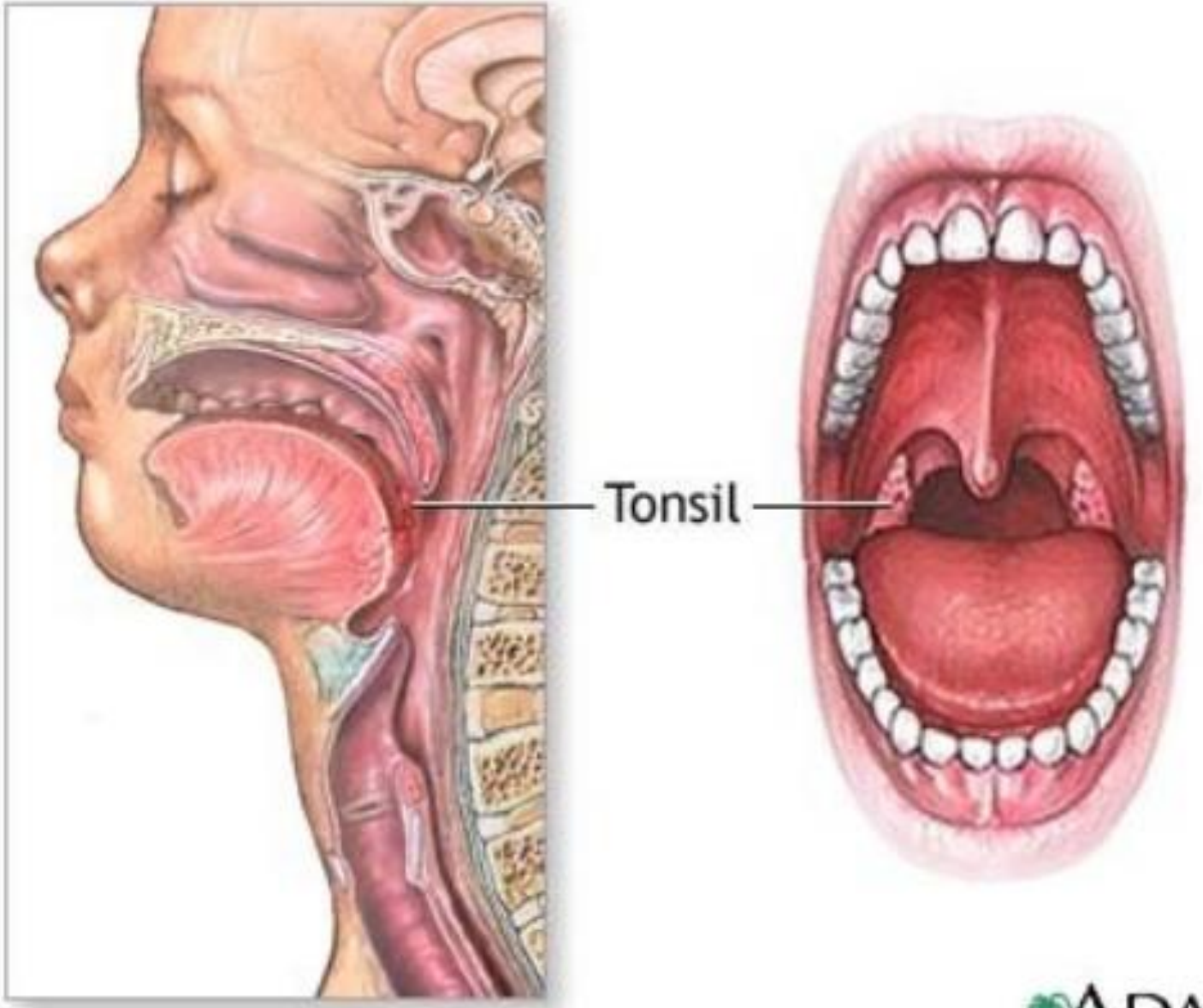
Splenic CT Injury Grading Scale	
Grade I	Laceration(s) < 1 cm deep Subcapsular hematoma < 1cm diameter
Grade II	Laceration(s) 1-3 cm deep Subcapsular or central hematoma l-3cm diameter
Grade III	Laceration(s) 3-10 cm deep Subcapsular or central hematoma 3-10 cm diameter
Grade IV	Laceration(s) > 10 cm deep Subcapsular or central hematoma > 10cm diameter
Grade V	Splenic tissue maceration or devascularization


HEAD
JUMP
FEET
MORE
image13
gas
stomach
contents
GB
pancreas
VC
AA
liver
spleen
5cm
right
left

SPLENECTOMY

- Spleen is particularly liable to rupture in falls and automobile accidents and bleeding from it is difficult to control and **Splenectomy** should be done.

- A **splenectomy** is a surgical procedure that partially or completely removes the spleen.

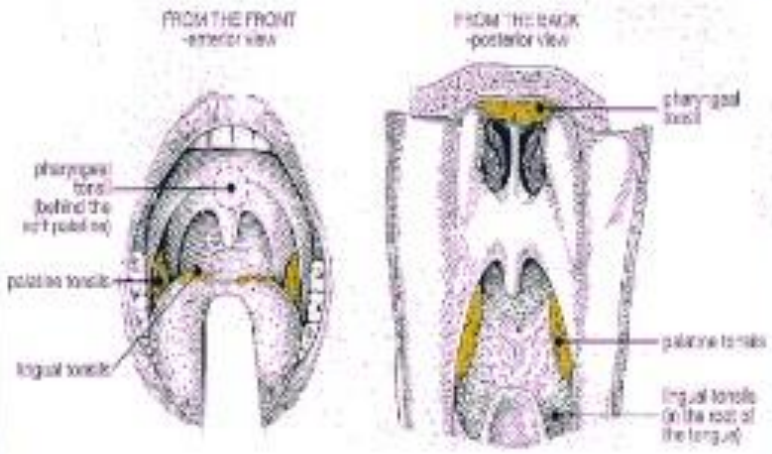

Tonsil
A.D.A.M.

OVERVIEW

- The palatine tonsils are dense compact bodies of lymphoid tissue that are located in the lateral wall of the oropharynx.
- The palatine tonsil represent the largest accumulation of lymphoid tissue in Waldeyer's ring.
- The Waldeyer ring is involved in the production of immunoglobulins and the development of both B-cell and T-cell lymphocytes.

WALDEYER'S RING

- Waldeyer's-Pirogov tonsillar ring (or pharyngeal lymphoid ring)



The ring consists of (from superior to inferior):

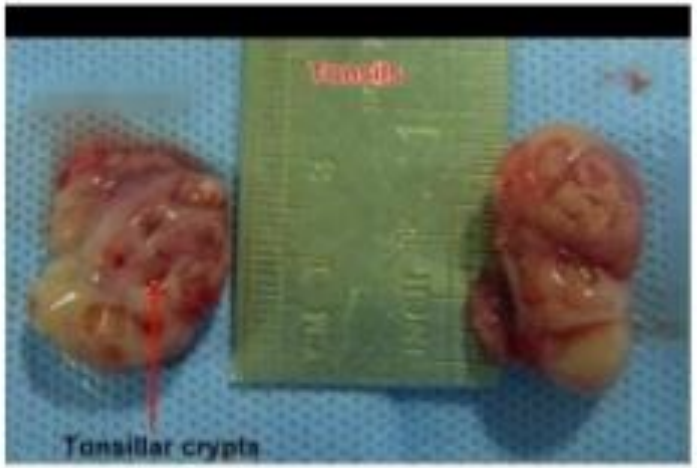
- Adenoids (superiorly in the nasopharynx).
- Palatine tonsils (laterally in the oropharynx).
- Lingual tonsils (inferiorly in the hypopharynx and posterior one-third of tongue).
- In addition, it includes lateral pharyngeral bands and scattered lymphoid follicles throughout the pharynx, particularly adjacent to the Eustachian tubes called Tubal tonsil.
- All structures in the Waldeyer's ring have similar histology and similar functions (production of immunoglobulins and the development of both B and T cell lymphocytes).

- SITUATION: The palatine tonsils occupy the tonsillar sinus or fossa between the diverging palatoglossal and palatopharyngeal arches.
- SURFACE MARKING
- SIZE:
  - Variable, 10-15 mm in transverse diameter and 20-25 mm in vertical dimension.
  - Bigger that which appears from the surface.
- FEATURES
  - Two surfaces
  - Two poles
  - Two borders

Medial Surface

- Covered by non-keratinizing stratified squamous epithelium.
- Tonsillar Crypts
- Crypta Magna or

intra tonsillar cleft



Lateral Surface

- Well-defined fibrous tonsillar hemicapsule.
- Formed by the condensation of pharyngo basillar fascia.
- Loose areloar tissue between capsule and bed of tonsil.
- Palatine vein/external palatine/paratonsillar vein descends from the palate in the loose areloar tissue.
- Capsule is firmly attached anteroinferioly to the side of the tongue, just in front of the insertion of palatoglossus and palatopharyngeus muscles.
- Tonsillar artey enters near this firm attachment.
- The fascia extends into the tonsil forming septa for passage of vessels and nerves.

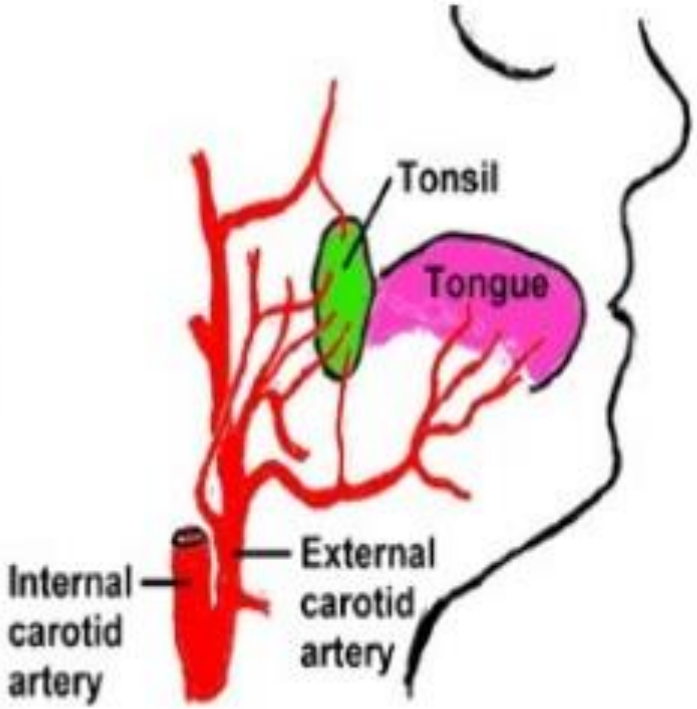
- UPPER POLE
  - Extends into soft palate
  - Semilunar fold/plica semilunaris (40%)
  - Supratonsillar fossa
- LOWER POLE
  - Attached to the tongue
  - Triangular fold/plica trangularis
  - Anterior tonsillar space
  - Tonsillolingual sulcus

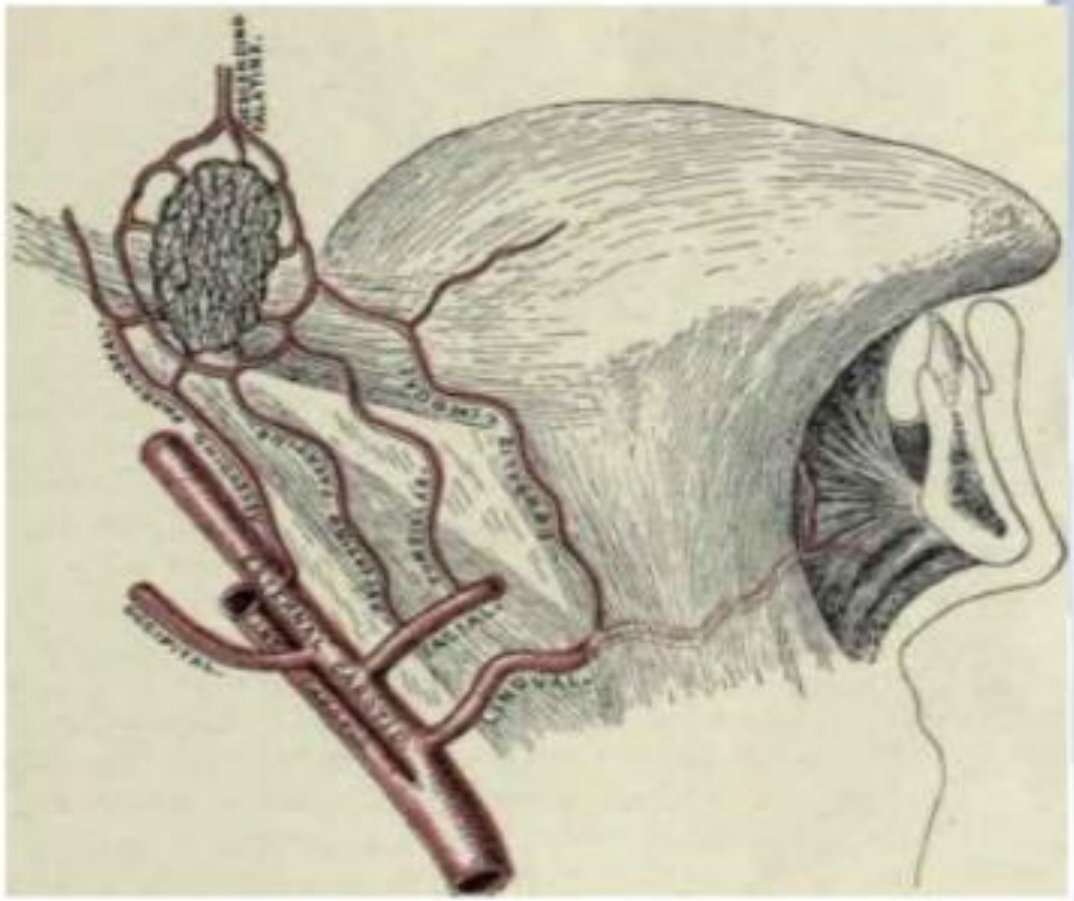
Bed of tonsil

- Superior Constrictor (above) and Styloglossus (below).
- Glossopharyngeal Nerve and Stylohyoid ligament.
- Structures outside Superior Constrictor.
- Internal Carotid artery.

BLOOD SUPPLY

- Upper Pole
  - Descending Palatine br. Of Maxillay artery (Ant.)
  - Ascending pharyngeal artery br. Of Ext. Carotid artey (Post.)
- Lower Pole
  - Dorsal Lingual br. Lingual Artery (Ant.)
  - Tonsillar br. Of Facial Artery (Main)
  - Ascending palatine br. Of Facial Artery (Post.)


Tonsil
Tongue
Internal carotid artery
External carotid artery



- VENOUS DRAINAGE
  - Paratonsillar vein – common facial vein – pharyngeal venous plexus – int. Jugular vein
- LYMPHATIC DRAINAGE
  - Upper deep cervical nodes particularly jugulodigastric (tonsillar) node.
- NERVE SUPPLY
  - Tonsillar br. Of Maxillary Nerve through Lesser palatine br. Of Sphenopalatine Ganglion
  - Glossopharyngeal N.

IMMUNOLOGY

- Act as sentinels at the portal of aero-digestive system
- Secondary lymphoid organ
- Predominantly B-cell type
- Antigen uptake
- Weak antigenic stimulus: differentiation of lymphocytes to plasma cells.
- Strong antigenic stimulus: proliferation of B-cells in germinal centres.
- Most active: 4-10 years of age

Introduction

- Sore throat is one of the most common symptoms encountered
- Patients use the term to describe almost any feeling in the throat, ranging from dryness to actual pain – important to ascertain the precise nature of sore throat & severity early in clinical history
- Severity – dysphagia for solid?, liquids?, saliva?

Differential Diagnosis of Sore Throat

1. **Tonsillitis**
2. **Pharyngitis**
3. **Adenoiditis**
4. **Peritonsillar abscess**
5. Infectious mononucleosis
6. Diphtheria
7. Lymphoma
8. Squamous cell carcinoma of tonsil
9. Trauma/Foreign body

Tonsilitis

- Inflammation of the tonsils especially the palatine tonsils

- Tonsillitis :
  - Acute tonsillitis
  - Chronic tonsillitis

Acute Tonsillitis

Classification – based on structure that involve

A. Superficial Tonsillitis

- part of generalized pharyngitis
- mostly seen in viral infection

B. Follicular Tonsillitis

- infection spread into crypts and it contain pus
- characteristic as yellowish spot

C. Parenchymatous Tonsillitis

- whole tonsil is involve
- generalized swollen and hypereamia

D. Membranous Tonsillitis

- sequale of a follicular tonsilitis
- exudation from crypts coelesce and form membrane on tonsil surface

Etiology

- It often affects school age and adult group
- Rare in infant and adult > 50 yo
- Most common organism
  - ***Haemolytic Streptococcus***
  - others: *Staphylococci , Pneumococci, H. Influenzae*

Clinical Features

- Symptoms
  - Sorethroat
  - Dysphagia & odynophagia
  - Fever (vary from 38-40°C)
  - Earache (either referred pain from tonsils/due to otitis media which may occur as a complication)

- Signs
  - Fetid breath
  - Coated tongue
  - Hyperemia of pillars, soft palate & uvula
  - Tonsils are red & swollen
  - Cervical (jugulodigastric) lymph nodes are swollen & tender

Management

- Bed rest with soft diet and plenty of fluids intake
- Analgesic and antipyeretic
- Antimicrobial therapy (presence of tonsillar exudates, presence of a fever, leukocytosis, contact with a person who has a documented GABHS infection): Penicillin/Erythromycin for 7-10 days
- Airway obstruction may require management by placing a nasal airway device, using intravenous corticosteroids, and administering humidified oxygen

Chronic Tonsilitis

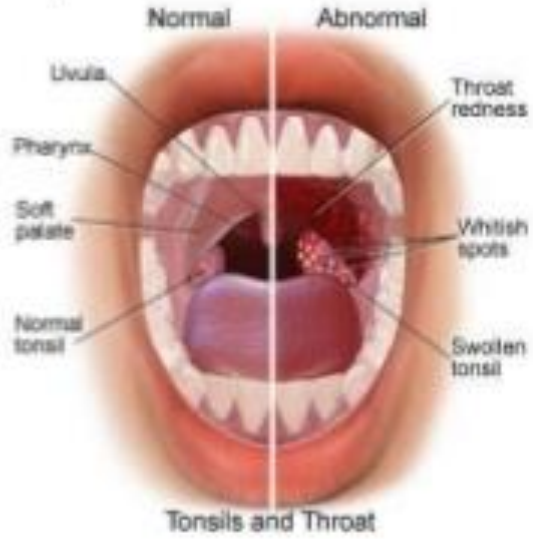
- Usually following acute or subacute tonsillitis
- Mostly affect children and young adult. Rare after 50 yo
- Chronic infection of sinus or teeth as predisposing factor
- Types :

1. **Chr. Follicular tonsillitis**
   - yellowish beads of pus on the medial surface tonsil
2. **Chr. Parenchymatous tonsillitis**
   - hyperplasia of lymphoid tissue
   - tonsil very enlarge and can interfere
   - speech deglutition and respiration
3. **Chr. Fibroid tonsillitis**
   - infected tonsils are small
   - small tonsil but pressure on the anterior pillar expresses frank pus or cheesy material
   - with hx of repeated sore throat

Clinical Features

- Symptoms :
  - Recurrent attack of sore throat or acute tonsillitis
  - Chronic irritation in throat with cough
  - Bad taste in mouth and halitosis (pus in crypts)
  - Thick speech
  - Difficulty in swallowing
  - Choking spells in night (tonsils large and obstructive)

- Signs :
  - Varying degree of tonsillar enlargement
  - Yellowish beads of pus
  - Small tonsil but may express frank pus or cheesy material with pressure on anterior pillar
  - Flushed anterior pillar
  - Enlargement of jugulodigastric lymph nodes



Tonsils and Throat

- **Treatment:**
  - **Conservative tx** consists of attention to general health, diet, tx of co-existent infection of teeth, nose and sinuses
  - **Tonsillectomy**
    is indicated tonsils interfere with speech, deglutition and respiration or cause recurrent attacks.

- **Complications:**
  - Peritonsillar abscess
  - Parapharyngeal abscess
  - Intratonsillar abscess
  - Tonsilloliths (calculus of tonsils)
  - Tonsillar cyst
  - Focus of infection in rheumatic fever, acute glomerulonephritis, eye and skin disorders


Thank you!