

ENDOSCOPY AND EUS IN ESOPHAGEAL TUBERCULOSIS

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INTRODUCTION

- Tuberculosis - “Captain among these men of death”¹
- Incidence - decreased -still remains a **major public health problem**.
- Esophageal TB is a **rare entity**, first diagnosed post-mortem in 1890 and ante-mortem in 1907².
- Incidence is around **0.14 % -0.15 %**. In GI Tuberculosis ETB **0.07%-3%**³.
- Clinical features are often **non-specific and variable**.

1. Rubin SA, Radiol. Clin. North Am. 1995; 33: 619–39.
2. Fahmy AR, Tuberculosis of the oesophagus. Thorax. 1969; 24: 254–6
3. Lockard LB. Esophageal tuberculosis. A critical review. Laryngoscope. 1913; 23: 561–84.

CHALLENGING DIAGNOSIS

- Diagnosis of ETB remains **challenging**.
- **Optimistic prognosis** with anti-tuberculosis therapy - still can be **life threatening**.
- **Prompt and explicit diagnosis** is essential.
- Esophagogastroduodenoscopy (**EGD**) and Endoscopic Ultrasound (**EUS**) both have an important role in diagnosis of ETB

ESOPHAGEAL TB CLASSIFICATION

- **Modes** of tubercular involvement of Esophagus may include
 - Swallowed **sputum**
 - **Direct** spread from Potts spine/ mediastinal lymph node/ tubercular lung cavity
 - Retrograde from **lymphatic** drainage
 - **Blood** borne
- There are **two types** of Esophageal Tuberculosis
 - Primary
 - Secondary

Role of endoscopy

- **Endoscopy:** Helps to observe the **morphology** of the lesion directly
- **EUS:** Detects the **echogenic** characteristics of lesion, **layers** of Esophageal wall, para-esophageal organs and tissues with ability to take **fine-needle aspiration** to obtain tissue samples.

Classification	Primary Esophageal TB	Secondary Esophageal TB
Frequency	Rare	Common
Extra-Esophageal TB lesions	Absence	Present
Etiology	Swallowed sputum or food contaminated with tubercle bacilli	Invasion of adjacent extra-Esophageal tubercular lesions

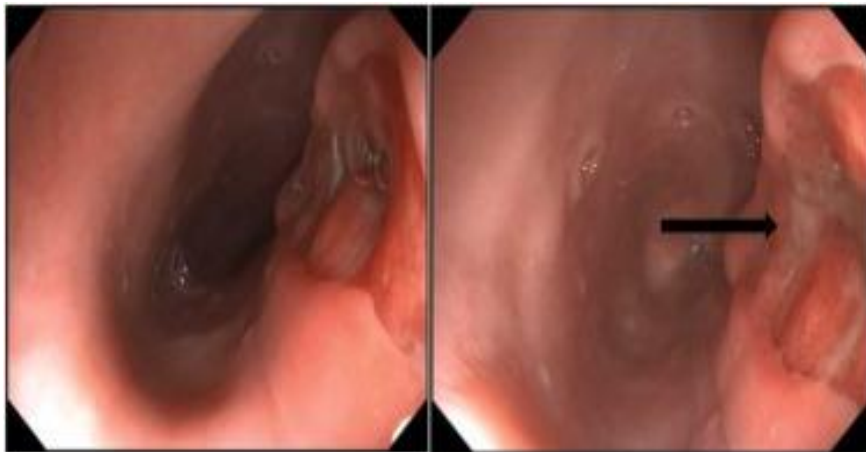
- Majority of ETB is **secondary**.
- **Primary ETB is rare** due to multiple **protective mechanisms** such as saliva, stratified epithelium, mucus and peristalsis.

CLINICAL MANIFESTATIONS

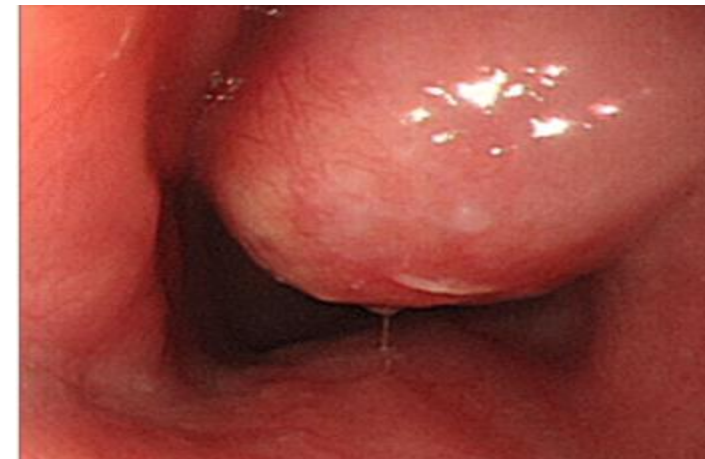
- Clinical features - **Variable**.
- **Dysphagia/odynophagia** – Most common due to fibrosis/obstruction/extrinsic compression of infected mediastinal lymph node.
- **Hematemesis** : Damage of blood vessel at **ulcer** base or Aorto-esophageal fistula.
- **Respiratory** complaints : Cough/ wheeze due to tracheo-Esophageal fistula.
- Other symptoms: Anorexia, night sweats, low grade fever and weight loss

UPPER GI ENDOSCOPY FINDINGS

- Multiple **morphological types** according to EGD
 - **Ulcerations** : mid-esophageal linear ulcerations with irregular infiltrated margins and greyish membranous necrotic base
(Reason: infected lymph nodes at subcarinal level)
 - **Eminence lesions**: intrinsic protruding lesions and extrinsic bulge compressions. Surface smooth/ulcerations/with fistula/ diverticula.



Mid-esophageal ulcerations due to TB



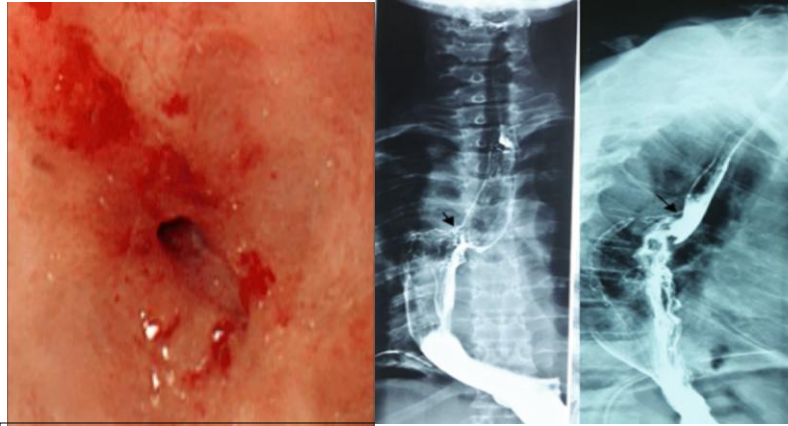
Eminence lesions

UPPER GI ENDOSCOPY FINDINGS

- **Granular lesions:** Scattered verrucous grayish nodules with ulcer/erosions.
- **Hypertrophic lesions :** Fibrotic lesions forming a pseudotumor.
- **Fistula :** Mediastinal and carinal lymph nodes. Tracheo-esophageal fistula
- Mediastinal **fibrosis**, **stricture** of Esophagus
- **Diverticula** formation



Mid-esophageal fistula formation



Esophageal stricture



Esophageal diverticula

ENDOSCOPIC ULTRASOUND FINDINGS

- Findings of ETB on EUS
 - Esophageal wall thickens when there is rupture of infected mediastinal lymph nodes.
- Tuberculous lymph node⁷
 - First phase : lymphoid hyperplasia – homogenous and hypoechoic
 - Second phase : caseous necrosis increases- hyperechoic foci/strands on heterogenous hypoechoic background representing calcification/fibrosis
 - Third phase: Adventitia destroyed, fused matted lymph nodes

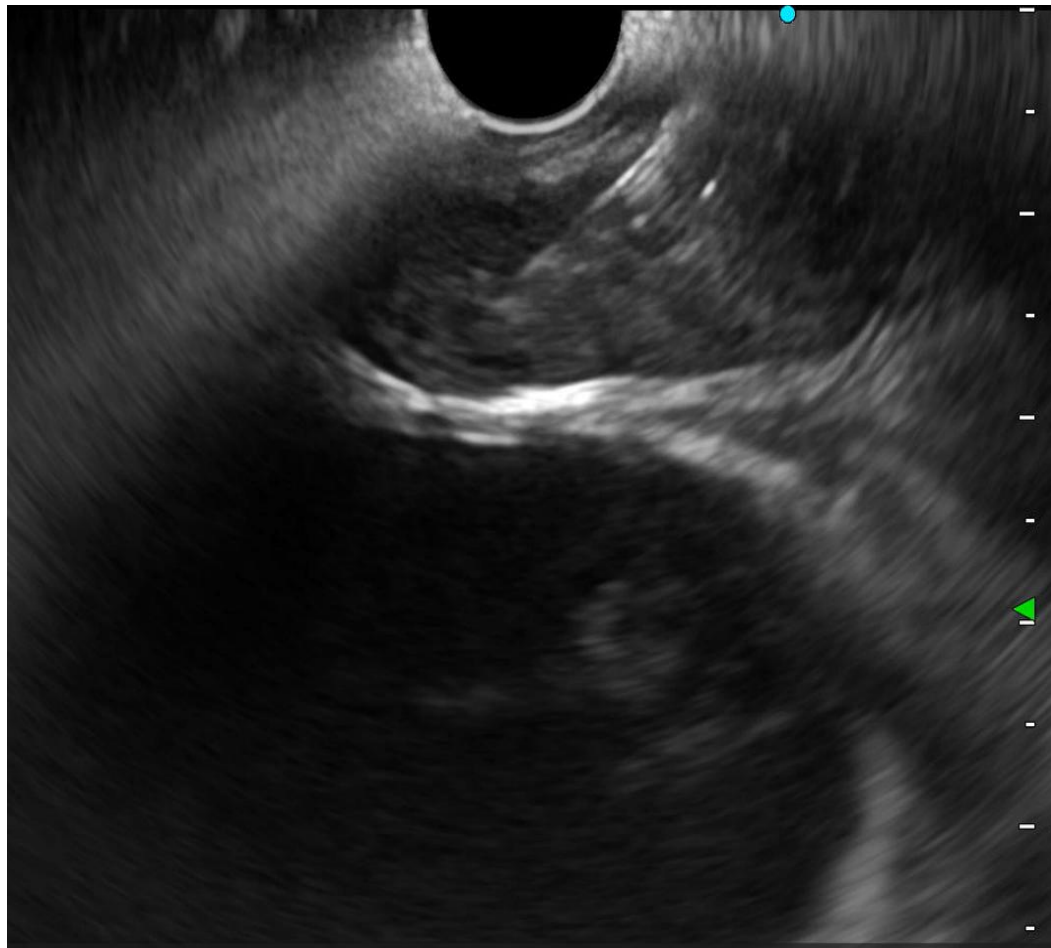


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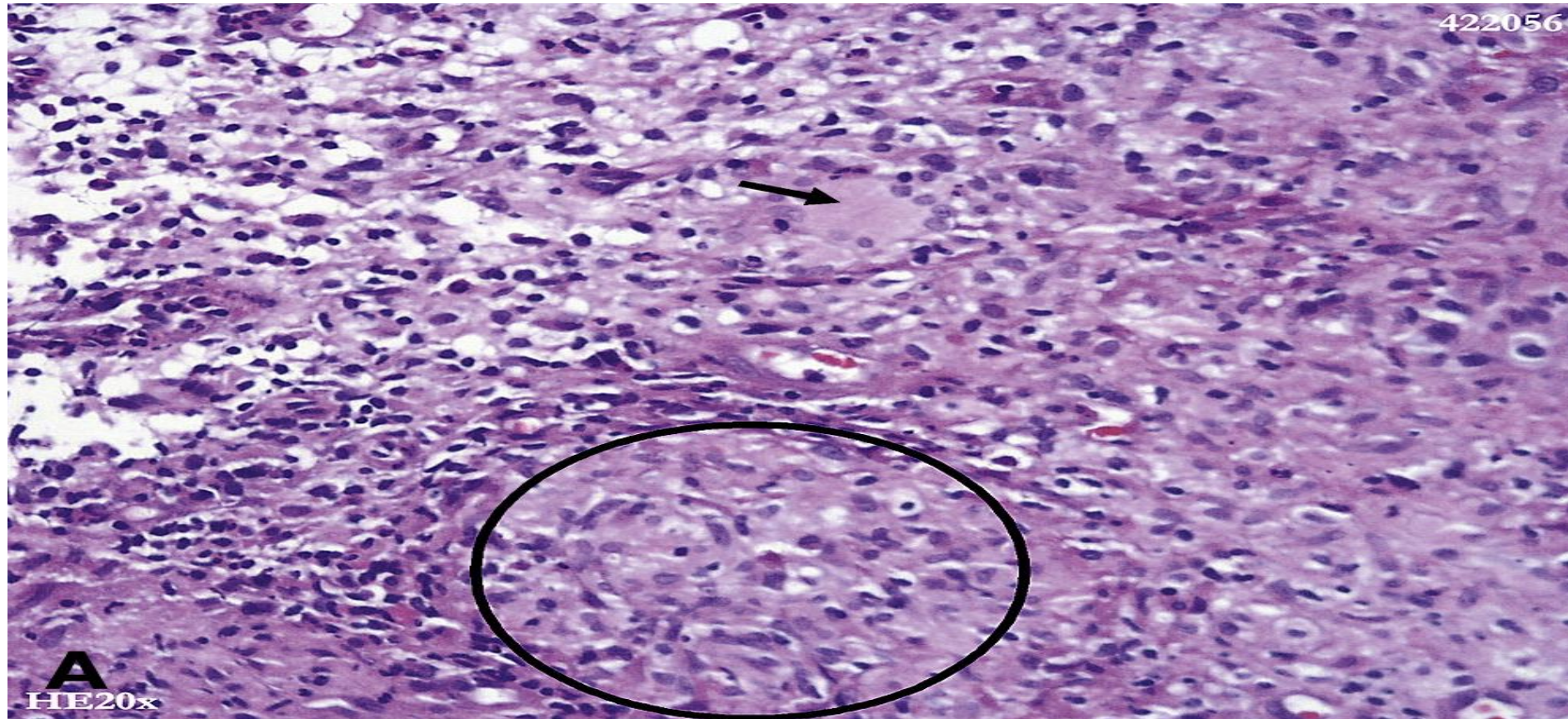
EUS AND FNA



Mediastinal lymph node



HISTOPATHOLOGY



Epithelioid cell
granuloma,
caseous necrosis,
and Langhans-
type
multinucleated
giant cells

- **Contrast enhanced harmonic endoscopic ultrasound (CH-EUS)**
 - Delineates vascular distribution and blood perfusion of target organs via agent injected into superficial medial cubital veins.
 - Findings in ETB: **Hypo enhancement** compared with surrounding tissues due to caseous necrosis and deficiency of blood supply
- **Elastography:** Soft- **Green** lesions.
- Characteristics of Esophageal tuberculosis with CH-EUS and Elastography needs **further studies and research.**

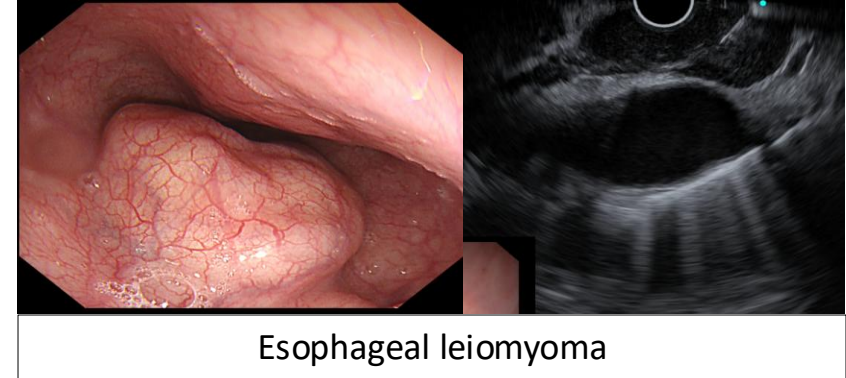
DIFFERENTIAL DIAGNOSIS

❖ Esophageal carcinoma

- **Primary** : Hypoechoic mass derived from epithelial layers infiltrating inside to outside
- **Secondary** : Metastatic lymph node invading externally

❖ Smooth muscle tumours

- **Benign** : Esophageal leiomyoma – Homogenous hypoechoic lesion ,regular margins, normal mediastinal lymph nodes
- **Malignant** : Leiomyosarcoma – Heterogenous hypoechoic lesion, irregular margins, malignant mediastinal lymph node (spherical, hypoechoic, sharp demarcation).



DIFFERENTIAL DIAGNOSIS

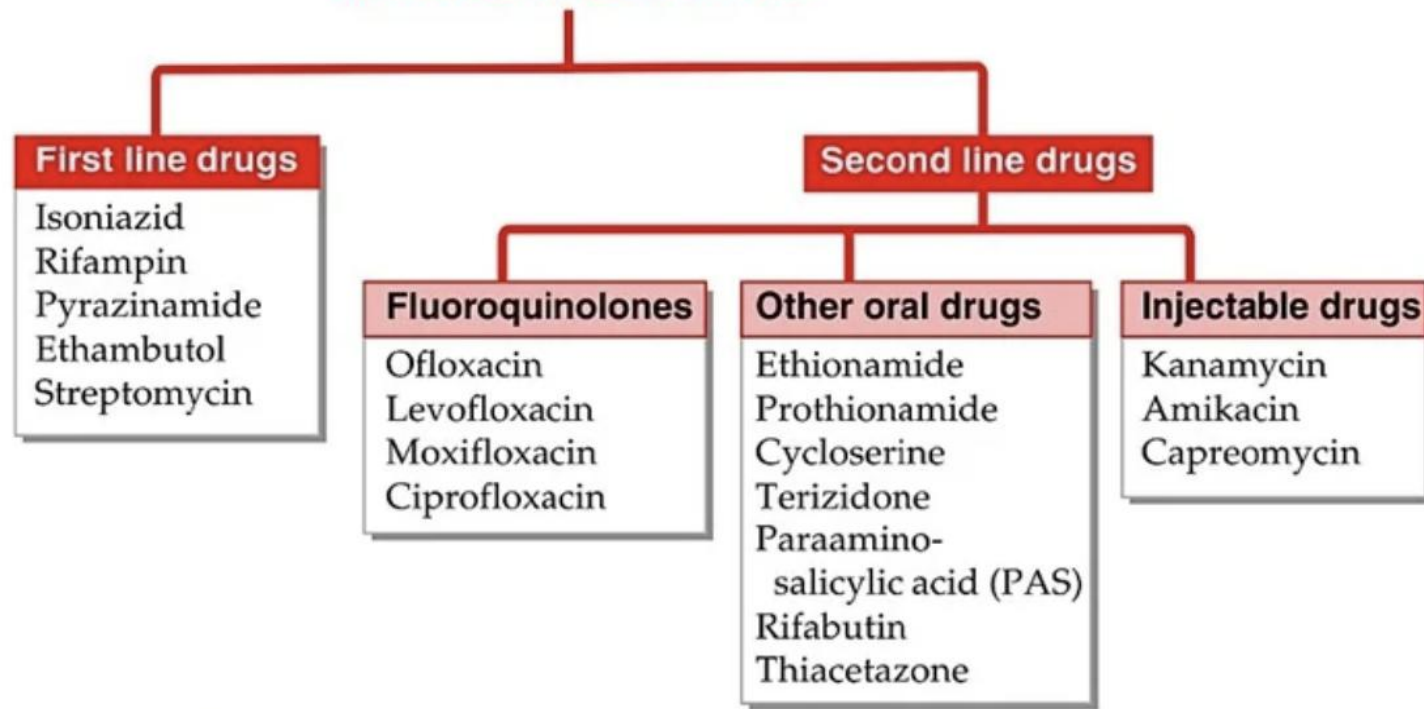
- **Sarcoidosis**
 - Non caseous necrotic granuloma involving multiple organs (nonspecific EUS findings)
- **Crohn's disease**
 - Layers of Esophageal wall destroyed. Thickening of Esophageal wall. Heterogenous echo with strands like hyperechoic areas.

ROLE OF ENDOSCOPY IN ACQUIRING ESOPHAGEAL SPECIMENS

Classification	Function	Testing Methods
Biopsy forceps	Removing regional esophageal mucosa	Histopathology : Tuberculous granuloma
EUS-FNA	Obtaining strip of tissue from deep tissues	Etiology: Zeihl-Neelson staining, Cultures, PCR

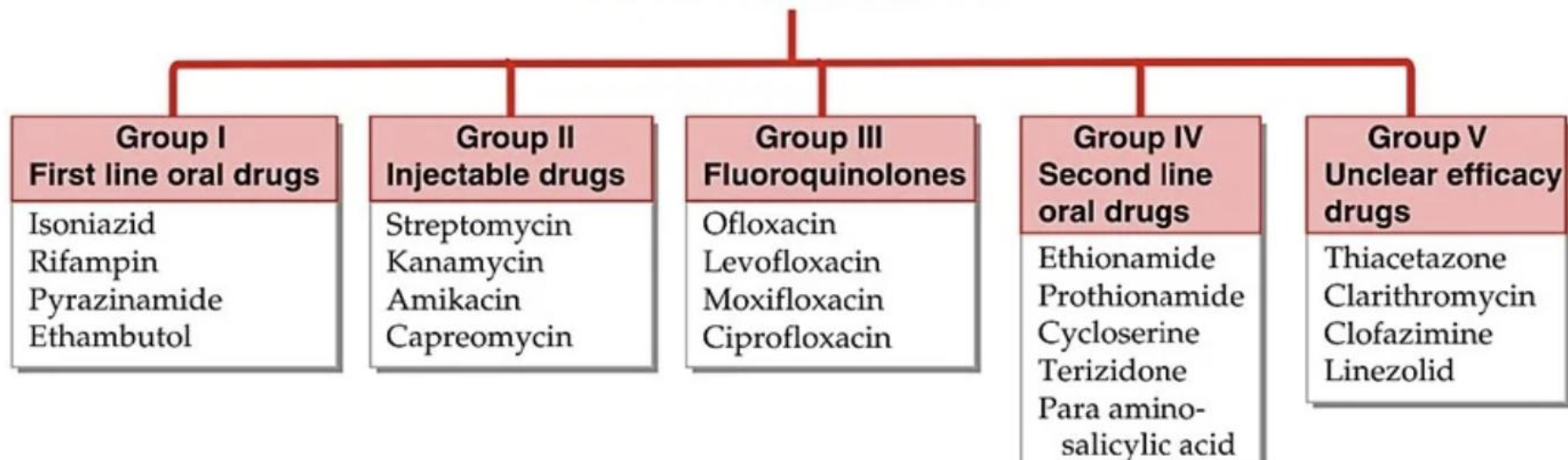
- Ziehl Neelson staining sensitivity: 40-60 % positive in only 25% cases
- Cultures : 80%-90 % but delayed results upto 6-8 weeks
- PCR: faster than culture. Similar sensitivity 80% -98 %

ANTITUBERCULAR DRUGS



ALTERNATIVE CLASSIFICATION

ANTITUBERCULAR DRUGS



ENDOSCOPIC TREATMENT FOR TB

- Over the scope clip application for closure of fistula
- Argon plasma coagulation : De-epithelization prior to closure of fistula

FISTULA CLOSURE WITH OTSC



TAKE HOME MESSAGE

- Esophageal tuberculosis -**Rare** but important **differential diagnosis** especially in **endemic** settings or **immunocompromised** hosts.
- A **high index of suspicion** is essential.
- **Endoscopy** plays a pivotal role in **diagnosis** but also in **therapeutic** management of complications
- Early recognition and timely initiation of **anti-tuberculosis treatment** can lead to excellent outcomes
- A **multi-disciplinary approach** integrating endoscopy, pathology and medical therapy is the key in **optimizing outcomes**.

THANK YOU