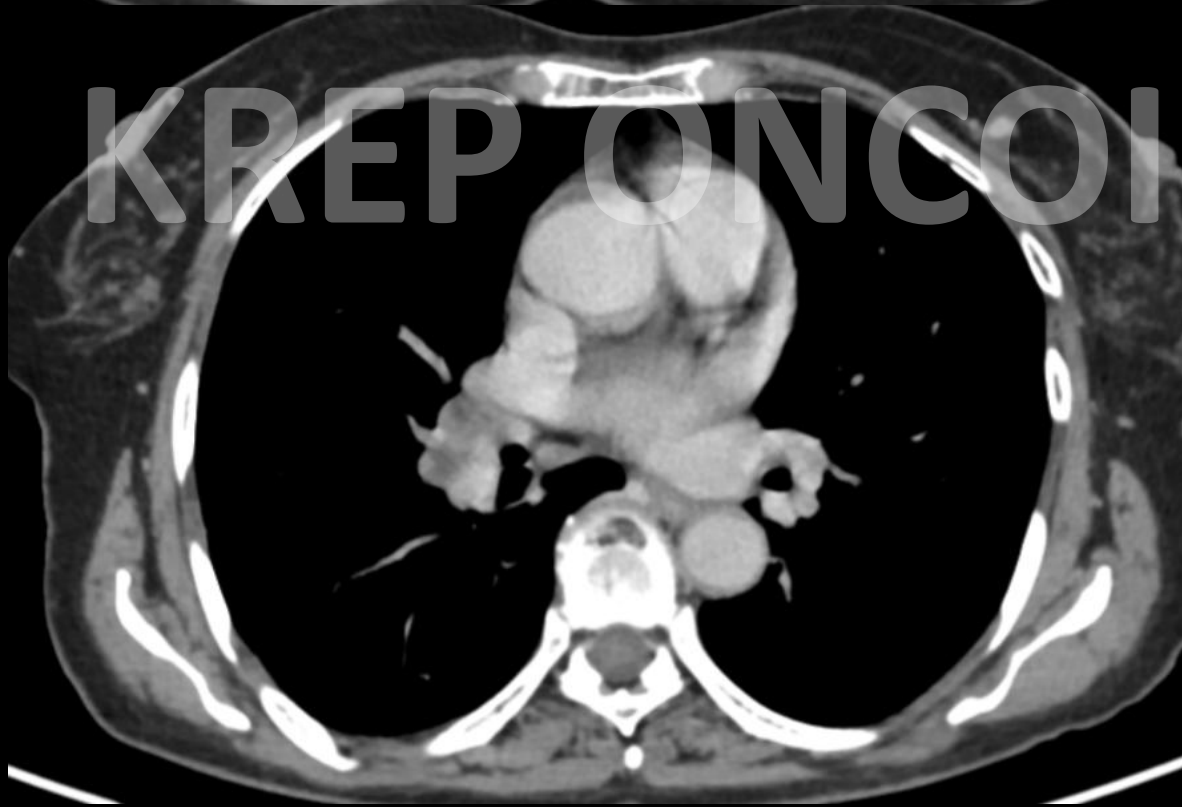
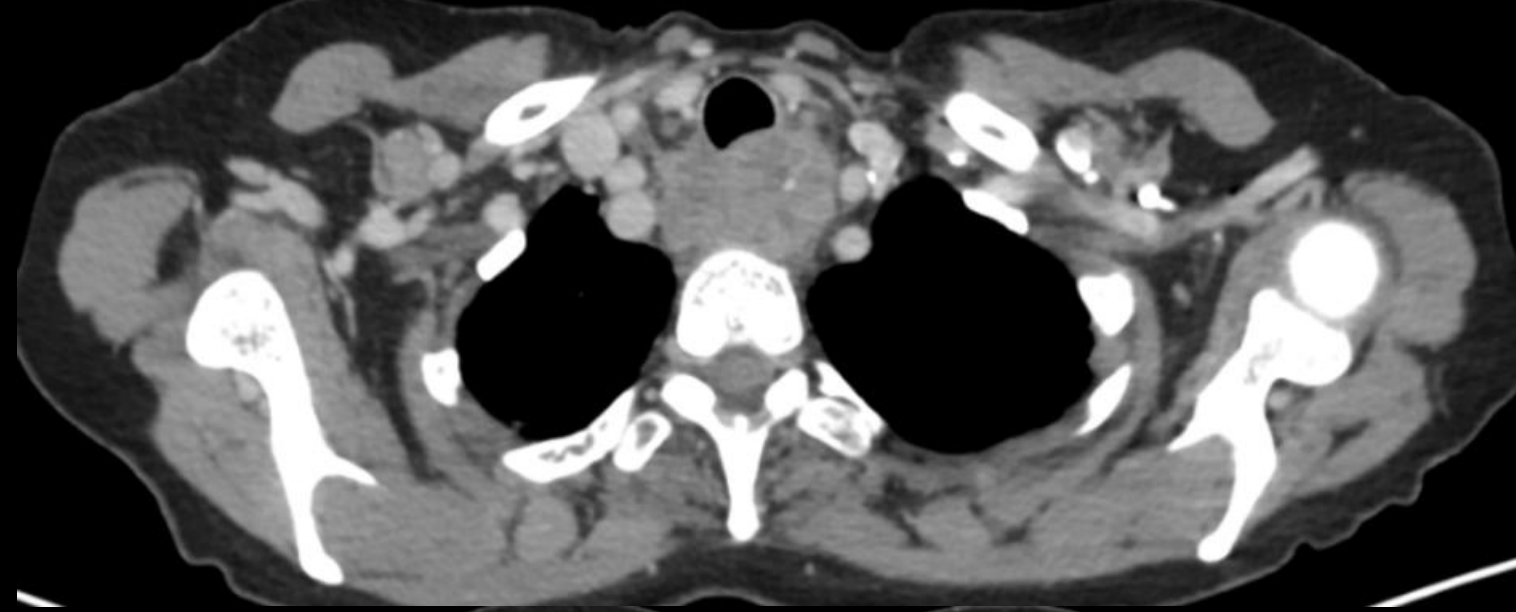


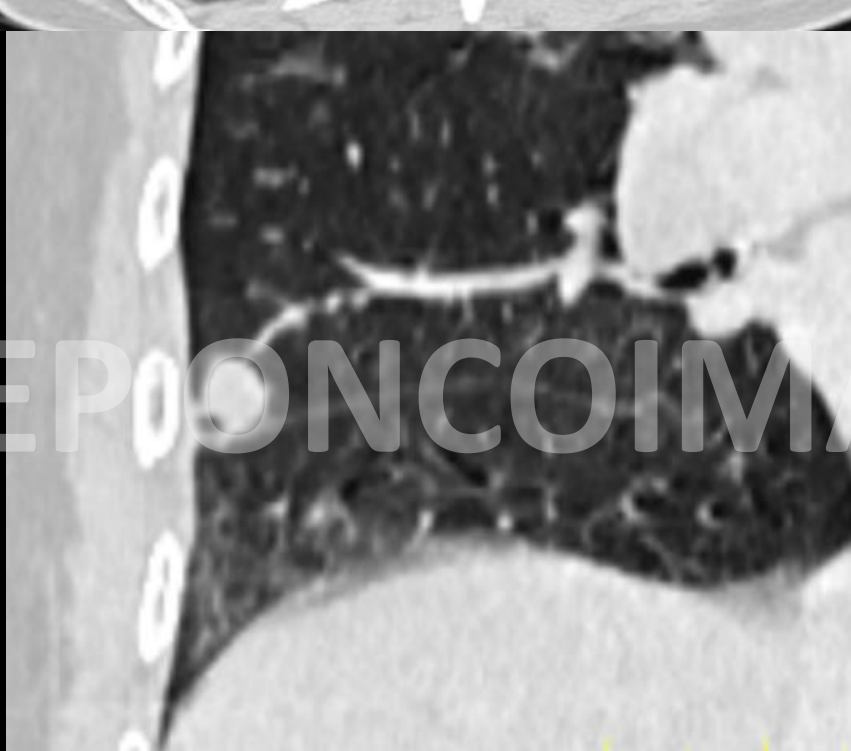
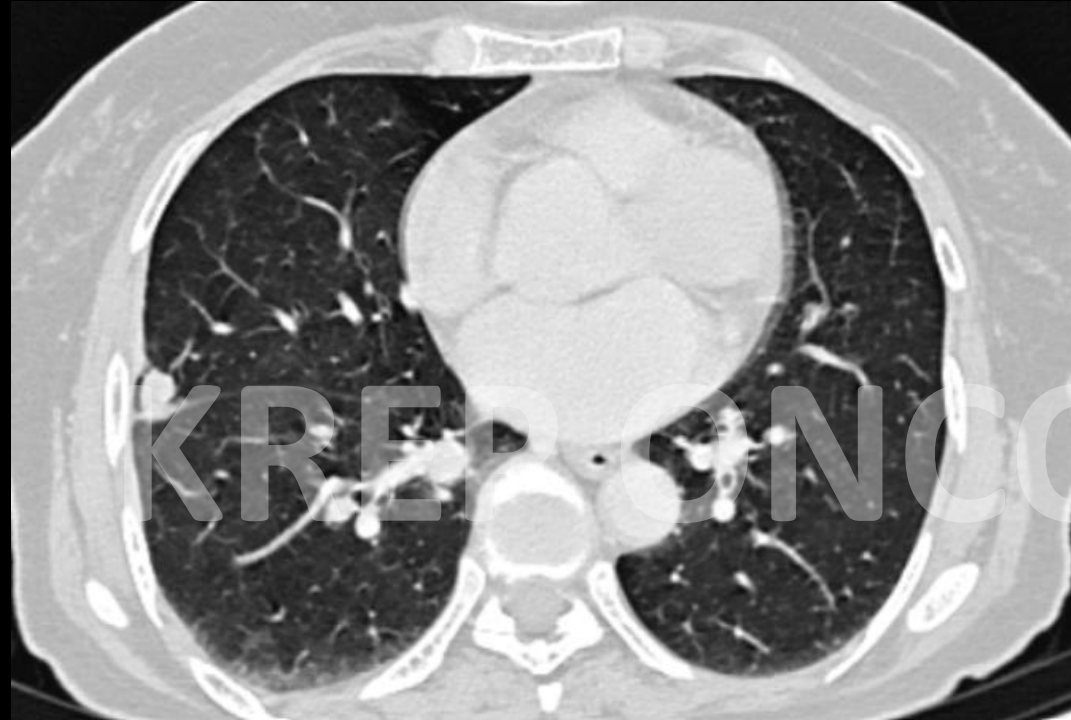


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KARNATAKA RADIOLOGY EDUCATION PROGRAM



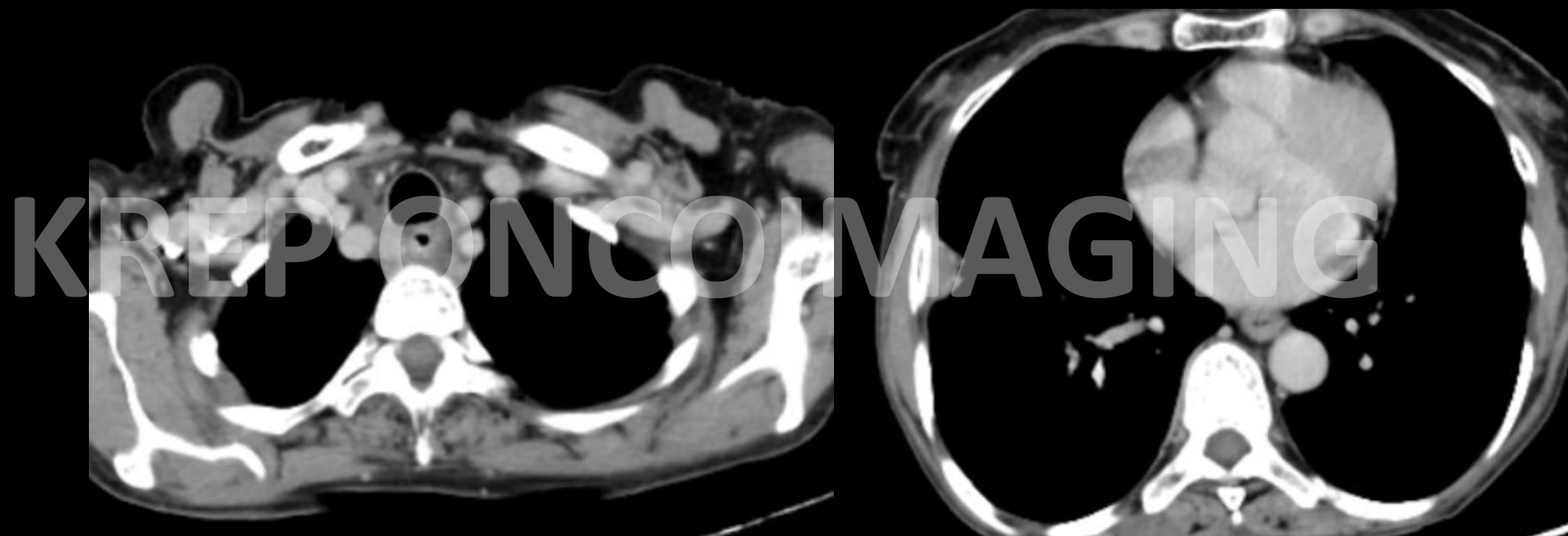
KREP ONCOIMAGING



- Recently diagnosed case of carcinoma esophagus –
- CT images show circumferential heterogeneously enhancing thickening in the cervical and upper thoracic with extension into periesophageal fat; there is long segment loss of fat planes with trachea without obvious bulging wall thickening. There was no further invasion of major vessels of neck/upper mediastinum.
- Few prominent regional lymph nodes were present in anterior superior mediastinal station.
- Few prominent lymph nodes (~0.8 cm SAD) are noted in lower right paratracheal and subcarinal stations.
- There are two enlarged right hilar lymph nodes with necrosis.
- A pleural based nodule with adjacent fissure thickening in right upper lobe posterior segment. On careful observation perilymphatic micronodules are noted along the subsegmental pulmonary vein.



- Patient was advised biopsy from the pleural based nodule. Patient was lost to follow up, returned after 1 month.
- Core needle biopsy of the nodule with broad base towards pleura showed metastatic squamous carcinoma.
- Patient underwent chemoradiation and showed partial response.
 - Primary has significantly reduced in size.
 - Pleural based nodule is stable.
 - Other lymph nodes have significantly reduced in size.



Role of Imaging in Esophageal Cancer Management in 2020: Update for Radiologists

Authors: Vetri Sudar Jayaprakasam, Randy Yeh, Geoffrey Y. Ku, Iva Petkovska, James L. Fuqua III, Marc Gollub, and Viktoriya Paroder | [AUTHOR INFO &](#)

Esophageal cancer can spread by direct extension to adjacent structures and by lymphatic and hematogenous spread. Absence of serosa in the esophageal wall allows easy spread of cancer to adjacent structures, including the larynx, aorta, pericardium, and diaphragm. Endobronchial and tracheal invasion can lead to fistula formation between the esophageal lumen and the airways. Lymphatic spread in esophageal cancer is complex. The esophageal submucosal lymphatic network is extensive and involves both transverse and longitudinal components. Therefore, radiologists need to keep in mind that tumors from different parts of the esophagus can metastasize to another location within the esophageal wall or to lymph nodes seemingly out of range for the primary tumor locations. For example, although intraabdominal nodal metastases are more likely to occur with lower esophageal cancers, upper and mid esophageal cancers can also spread to celiac and other intraabdominal nodes [38]. Even early-stage esophageal cancers have a propensity to metastasize.

1. Pathology & Histologic Types:

- Two dominant subtypes:
 - **Squamous Cell Carcinoma (SCC)**: arises from stratified squamous epithelium, most common in the **upper and mid-thoracic esophagus**.
 - **Adenocarcinoma**: originates from **Barrett's metaplasia**, typically in the **distal esophagus** or **gastroesophageal junction (GEJ)**.
- Rare types: small-cell carcinoma, adenosquamous carcinoma, sarcomatoid carcinoma.

2. Epidemiology & Risk Factors:

- **SCC**: associated with **tobacco, alcohol, achalasia, caustic injury, Plummer–Vinson syndrome**.
- **Adenocarcinoma**: linked to **GERD, Barrett's esophagus, obesity, hiatal hernia**.
- Male predominance; peak in 6th–7th decade; increasing incidence of distal adenocarcinoma in Western populations.

3. CT Imaging Characteristics:

- Appears as **circumferential or eccentric wall thickening (> 5 mm)**, usually **irregular and asymmetrical**.
- **Loss of luminal distensibility** and **shouldering margins** are typical.
- May present as a **fungating intraluminal mass, annular constricting lesion, or infiltrative wall thickening**.
- Evaluate for **adjacent fat stranding, mediastinal invasion, and nodal metastases**.

4. MRI & PET/CT Findings:

- **MRI:** Superior soft-tissue delineation—accurate for assessing **depth of mural invasion (T-stage)** and **aortic/tracheobronchial involvement**.
 - **PET/CT:** Highly sensitive for **metastatic disease** (nodes, liver, bone, adrenal); useful for **treatment response evaluation**.
 - **SUVmax** often correlates with tumor grade and proliferative activity.
-

5. Endoscopic & Functional Correlates:

- **Barium swallow:** irregular, shouldered narrowing or “**apple-core lesion**.”
 - **Endoscopic ultrasound (EUS):** gold standard for **T and N staging**, visualizing wall layers and periesophageal nodes.
 - MRI/CT complement by defining **regional extension and distant metastases**.
-

6. Patterns of Spread:

- **Longitudinal submucosal spread** → skip lesions possible; margins should include ≥ 5 cm.
- **Lymphatic drainage is segmental and bidirectional:**
 - Upper → cervical nodes
 - Mid → paratracheal, subcarinal, hilar
 - Lower → left gastric, celiac nodes
- **Direct invasion** into trachea, aorta, pericardium, diaphragm, or liver defines T4 disease.

7. Typical Sites of Metastasis:

- Regional lymph nodes, liver, lungs, bone, and adrenal glands.
 - Brain metastases are less common than in adenocarcinomas of lung or colon.
-

8. Oncoradiologic Importance:

- CT and MRI define tumor length, wall invasion, and organ involvement (T-stage).
- PET/CT determines metabolic activity, nodal burden, and distant metastasis (M-stage).
- Structured reporting should include:
 - Tumor location (upper/mid/lower/GEJ)
 - Length and wall thickness
 - Fat plane preservation or invasion
 - Regional and distant nodes
 - Organ invasion and distant metastases.
- Imaging is pivotal for TNM staging, surgical planning (esophagectomy vs chemoradiation), and response assessment.

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