2025

KARNATAKA RADIOLOGY EDUCATION PROGRAM

CASE 2

A 61-year male patient comes with c/o right axillary swelling since 6 months with restriction of movement in shoulder since 1-2 months

The swelling was insidious in onset gradually progressive and was initially noted in the inner shoulder / upper arm , now has gradually progressed to involve the right axilla with restriction of shoulder movement.

O/ E :- 20 x 25 cm , hard, non-mobile mass in left axilla with dilated veins over surface

CASE –2

Differentials based on history :-

- Osseous lesion – Osteosarcoma (why – long bone involvement ; age ; hard , non-mobile lesion ; aggressive lesion) (why not
- Cartilaginous origin lesion – chondroblastoma, chondrosarcoma (why – age ; long bone involvement; hard , non-mobile lesion ; aggressive lesion)
- Soft tissue lesion like rhabdomyosarcoma.

SEQUENCE OF EVENTS – what actually happened ?

- MRI (28-06-22)
- Biopsy (29-06-2022) - dedifferentiated chondrosarcoma
- CT THORAX (04-07-2022) to look for extent and metastasis
- MRI (04-07-2022) -
- CT THORAX (17-08-2022) to look for extent and metastasis

HISTOPATHOLOGY REGULAR HP SMALL BIOPSY Lab No H-4816/22.: 28/06/2022

Gross Examination : Received 4 linear cores of tissue ranging in size from 0.9 to 1.9 cm along with fragmented cores of 0.2 cm. Entire tissue processed in 1 capsule.

Microscopy and Impression These cores show a cartilagenous neoplasm. It shows cartilage with necrosis. These are surrounded by sheets of epithleoid looking atypical cells. They are large with pleomorphic nucleus and abundant cytoplasm. Mitotic figures are noted in these cells. - Overall, features are suggestive of Dedifferentiated Chondrosarcoma - Right arm.

Feb 07,2023

Notes

Physician Note

Case metastatic Dediffrentiated chondrosarcoma right proximal humerus

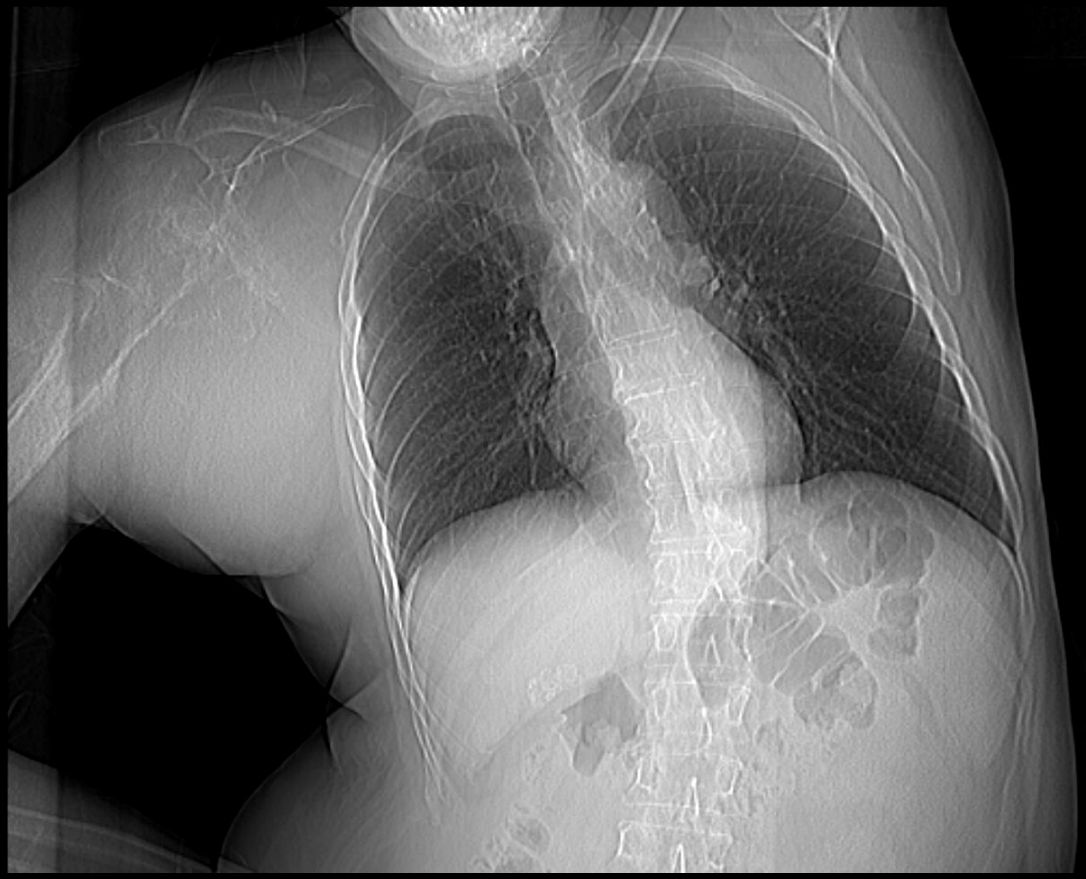
Underwent palliative Forequarter amputation in Aug 2022

come now with weakness

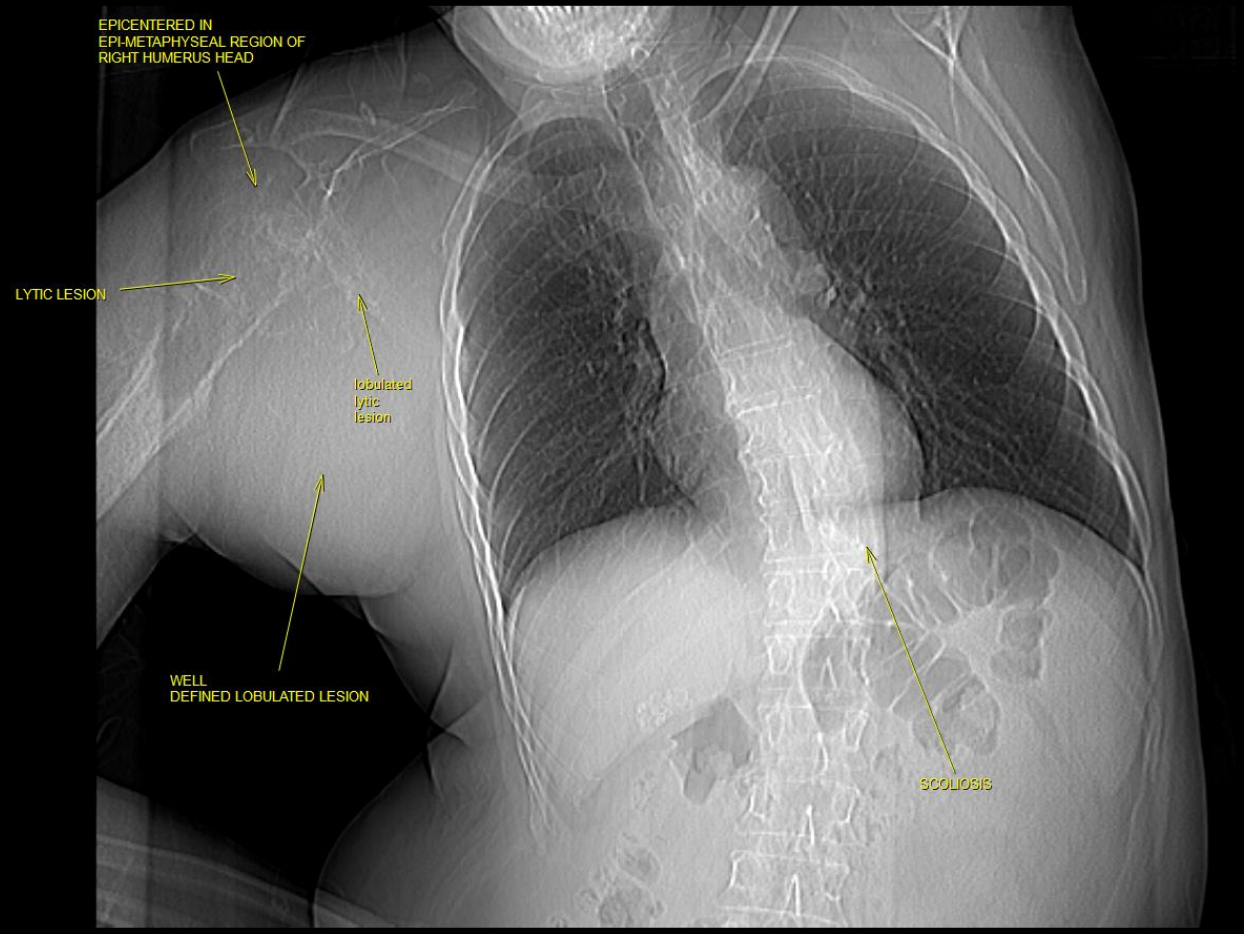
they are not willing to get the scan done

adv- Refer to Best supportive care/ Palliative Care

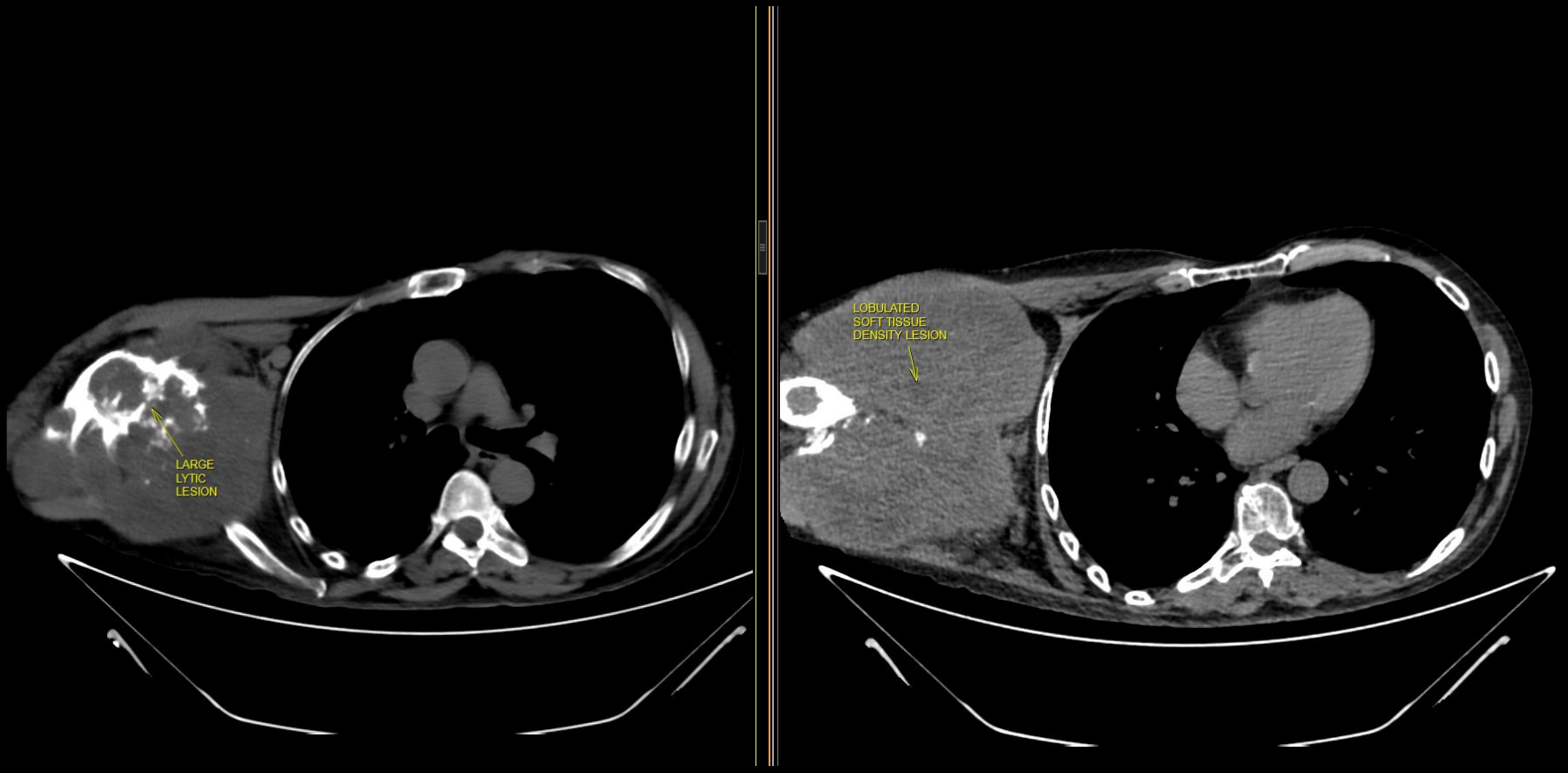
RADIOGRAPH / SCANOGRAM



RADIOGRAPH / SCANOGRAM

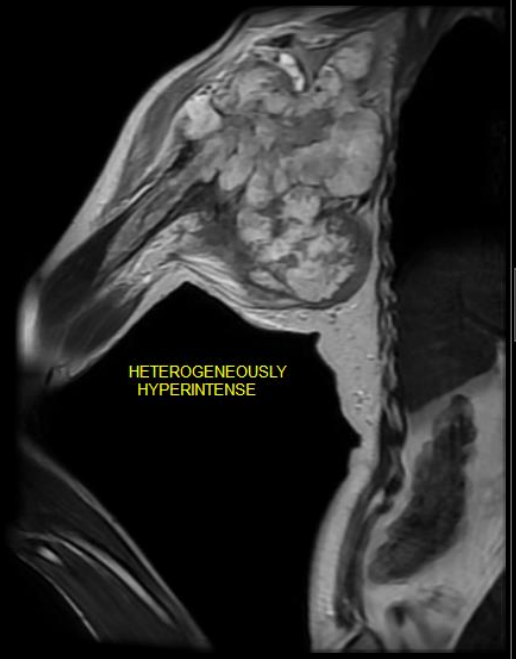


CT

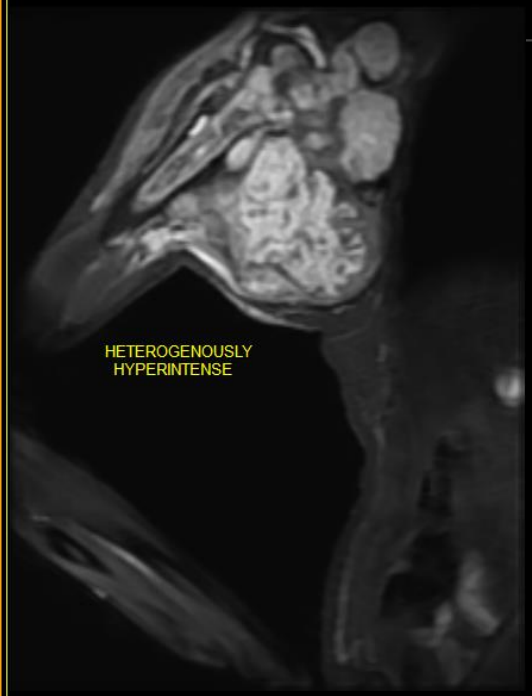


MRI

T1W

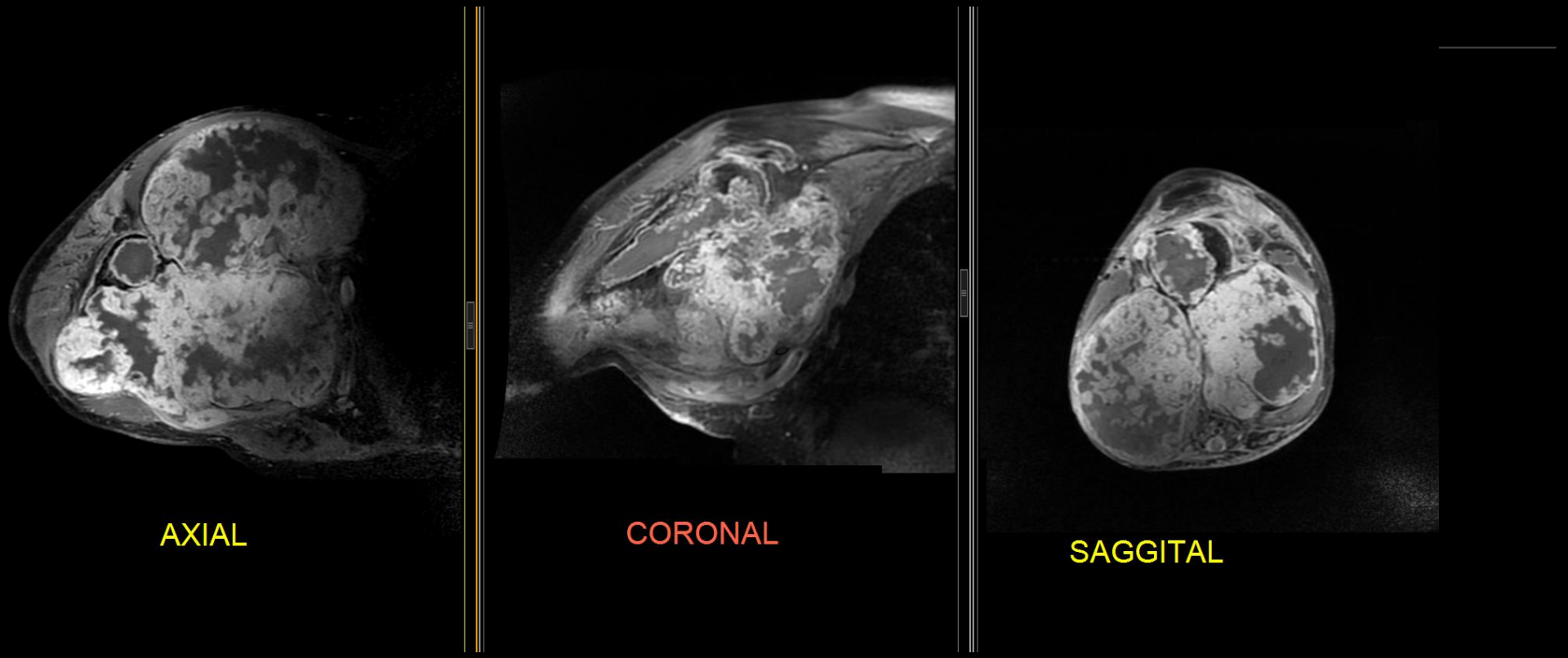


T2W

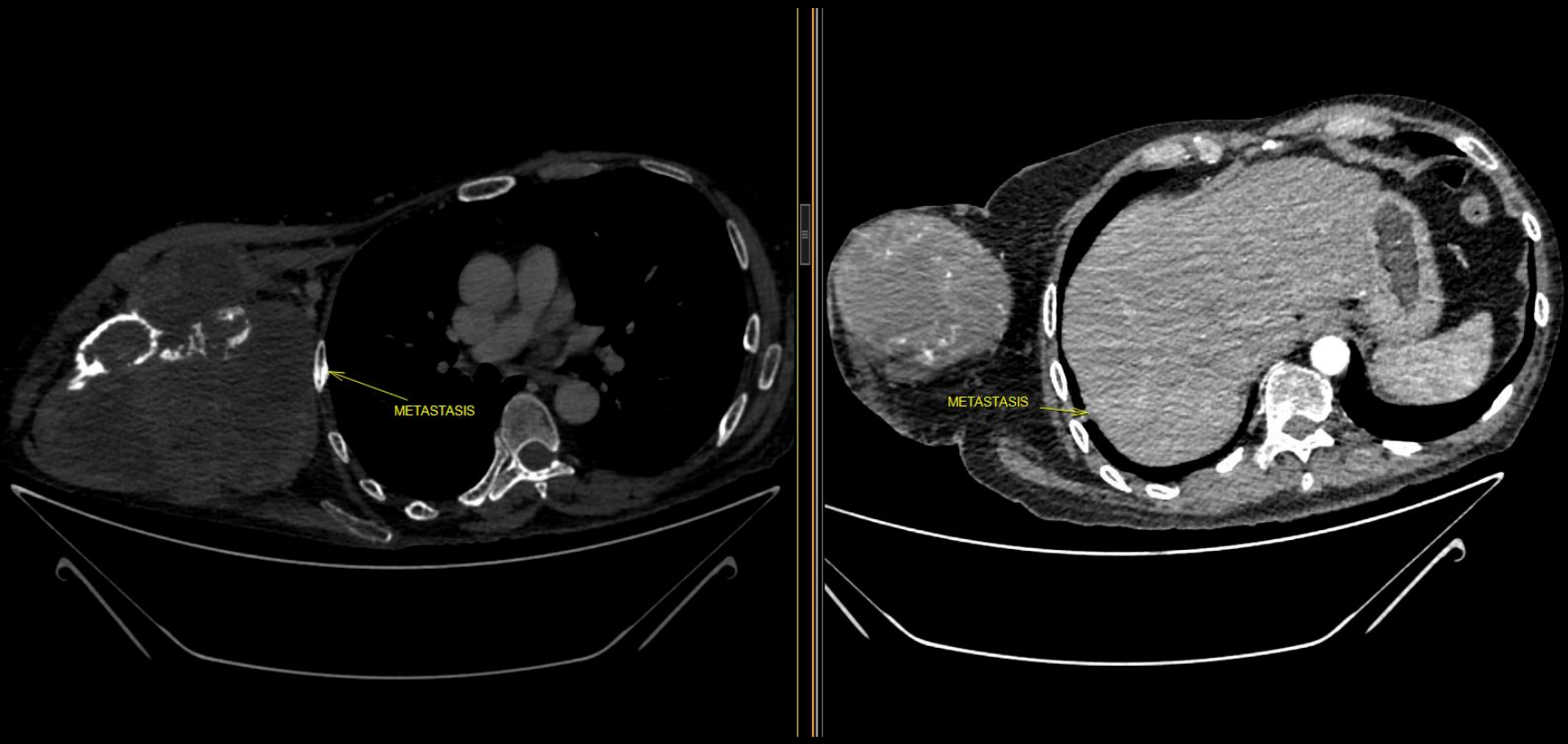


STIR

MRI – post contrast images



CT – Pre-op (17.08.2022)



OPERATION / PROCEDURE

Surgeons : Dr. Suman, Dr Murugendra
Anaesthesia : Dr Murugesn C
Diagnosis : Metastatic dedifferentiated chondrosarcoma right proximal humor
Operation : Forequarter amputation right side
Procedure:
Patietn taken in lateral position, parts painted and draped. Anterolateral incision was taken. Conjoint tendon were retracted. Long head of biceps was cut. Brachial neurovascular bundle identified and traced proximally at axially. Neurovascular bundle were going into the tumor. it was been explained to the patient relatives with intraoperative pictures and gave options of amputation versus abandoning the surgery, they gave consent for amputation. Circumferential incision was taken along the medial boarder of scapula extending anteriorly. Pectoralis major was cut. Brachial plexuses, subclavian vessel were identified and ligated. Medial border attached to scapular were released. Clavicle was cut at M1/3 and L1/3. the whole space was excised enblock. Axillary node clearance was done, wound closed in layers under negative suction drain.

CHONDROSARCOMA

- Chondrosarcomas are a heterogeneous group of malignant cartilaginous tumors most commonly found in older patients.
- Can arise de novo or secondary from an existing benign cartilaginous neoplasm.
- On imaging, these tumors have ring-and-arc chondroid matrix mineralization with aggressive features such as lytic pattern, deep endosteal scalloping and soft-tissue extension.

Clinical presentation

- Pain, a palpable lump or a local mass effect.
- They are also found incidentally in imaging studies. Some chondrosarcomas present with a pathological fracture.

CHONDROSARCOMA - Pathology

- Aggressive cartilage matrix-forming tumors.
- Either primary, arising de novo, or secondary originating from a pre-existent cartilaginous mass.
- Tumors are multilobulated (due to hyaline cartilage nodules) with central high-water content and peripheral endochondral ossification.
- On imaging, this accounts not only for the high T2 MRI signal but also for rings and arcs calcification or popcorn calcification.

CHONDROSARCOMA – Sub-types

1. Conventional chondrosarcoma (85-90%)
2. Dedifferentiated chondrosarcoma (in up to 10% of conventional carcinomas)
3. Mesenchymal chondrosarcoma (~2-4%)
4. Periosteal chondrosarcoma (~2-3%)
5. Clear cell chondrosarcoma (~2%)
6. Extra-skeletal chondrosarcoma (~1%)

CHONDROSARCOMA – ASSCN

Associations

- Solitary osteochondromas and hereditary multiple exostoses
- Ollier disease
- Maffucci syndrome

CHONDROSARCOMA – Grading

GRADE	FEATURES	EXAMPLES
Low grade	• Low cellularity • Mostly chondroid matrix • Little if any myxoid	• Conventional chondrosarcoma • Juxtacortical chondrosarcoma
Intermediate grade	• Increased cellularity • Little chondroid matrix • Necrosis and more common prominent myxoid	• Conventional chondrosarcoma • Juxtacortical chondrosarcoma • Myxoid chondrosarcoma
High grade	• Highly cellular • Nuclear pleomorphism • Absent chondroid matrix • Stroma present is myxoid	• Conventional chondrosarcoma • Juxtacortical chondrosarcoma • Mesenchymal chondrosarcoma • Dedifferentiated chondrosarcoma

Radiographic features- Plain Radiograph

- Lytic lesion (50%)
- Intralesional calcifications: ~70% (rings and arcs calcification or popcorn calcification)
- Endosteal scalloping affecting more than two-thirds of the cortical thickness (cf. less than two-thirds in enchondromas)
- Moth-eaten appearance or permeative appearance in higher grade tumors (see chondrosarcoma grading), e.g., myxoid, dedifferentiated and mesenchymal chondrosarcomas
- Cortical remodeling, thickening and periosteal reaction are also useful in distinguishing between an enchondroma and low-grade chondrosarcoma (see enchondroma vs low-grade chondrosarcoma)

CT

- 94% of cases demonstrate matrix calcification, cf. 60-78% on plain film.
- Endosteal scalloping
- Cortical breach, seen in ~90% of long bone chondrosarcoma, cf. only ~10% of enchondromas
- Soft tissue mass: tumor cellularity, and therefore density, increases with the increased grade of the tumor
- Heterogenous contrast enhancement

MRI

T1: low to intermediate signal

- Iso- to slightly hyperintense cf. muscle
- Iso- to slightly hypointense cf. grey matter (see chondrosarcoma of the base of the skull)

T2: very high intensity in non-mineralized/calcified portions - the cartilage is a hydrophilic tissue with high water content6

- Gradient echo/SWI: blooming of mineralized/calcified portions

T1 C+ (Gd)

- Enhancement can be septal and peripheral rim-like corresponding to fibrovascular septation between lobules of hyaline cartilage - rings and arcs enhancement pattern.
- Most demonstrate heterogeneous moderate to intense contrast enhancement.

COMPLICATIONS

- Recurrence of the tumor
- Distant metastases: The primary site of metastasis is the lung. The rate of metastasis varies according to the grade of chondrosarcoma.
  - Low-grade: less than 10%
  - Intermediate-grade: 10%–50%
  - High-grade : 50%–70%

DIFFERNTIAL DIAGNOSIS

- Chondromyxoid fibroma
- Enchondroma
- Chondroblastic osteosarcoma
- Fracture callus

Treatment

- Location and histologic grade determine the treatment approaches of chondrosarcoma. The primary treatment modality of chondrosarcoma is surgical excision.
- Low-grade central chondrosarcoma can be treated with intralesional curettage, burring and surgical adjuvant application such as hydrogen peroxide.
- Tumors with intraarticular or soft tissue involvement, larger tumors, axial or pelvic tumors must be treated with wide excision. For the intermediate or high-grade chondrosarcoma, wide en bloc excision is the surgical approach of choice
- Chemotherapy and radiation generally play no role, except for mesenchymal chondrosarcomas.

Prognosis

- Histological grade is the single most important predictor of local recurrence and metastasis.
- Low-grade chondrosarcomas, which grow insidiously and rarely metastasize, have a good prognosis. The 5-year survival of grade I chondrosarcomas is 83%.
- High-grade chondrosarcoma and dedifferentiated chondrosarcoma, by comparison, have an inferior prognosis due to the rapid growth of the tumor and the propensity for early metastasis.
- The 5-year survival of grade II and III chondrosarcomas is of 53%.