MALIGNANT BONE TUMOURS -2

DR RAJAT GUPTA

ORTHOPAEDIC ONCOLOGIST

BONE CANCER CLINIC

CHANDIGARH +91-9930372264

www.curebonecancer.com

MALIGNANT BONE TUMOURS -2

DR RAJAT GUPTA

ORTHOPAEDIC ONCOLOGIST

BONE CANCER CLINIC

CHANDIGARH +91-9930372264

www.curebonecancer.com

EWING'S SARCOMA

- 2ND MOST COMMON PRIMARY BONE CANCER OF CHILDREN & ADOLESCENTS
- MOST COMMON PRIMARY BONE MALIGNANCY <10YEARS
- INCIDENCE OF 1 PER MILLION PER YEAR
- USUALLY PRESENTS IN AGE GROUP 5-25 Y

EWING'S SARCOMA

- METAPHYSEAL OR DIAPHYSEAL

- COMMON IN FLAT BONES

EWING'S SARCOMA

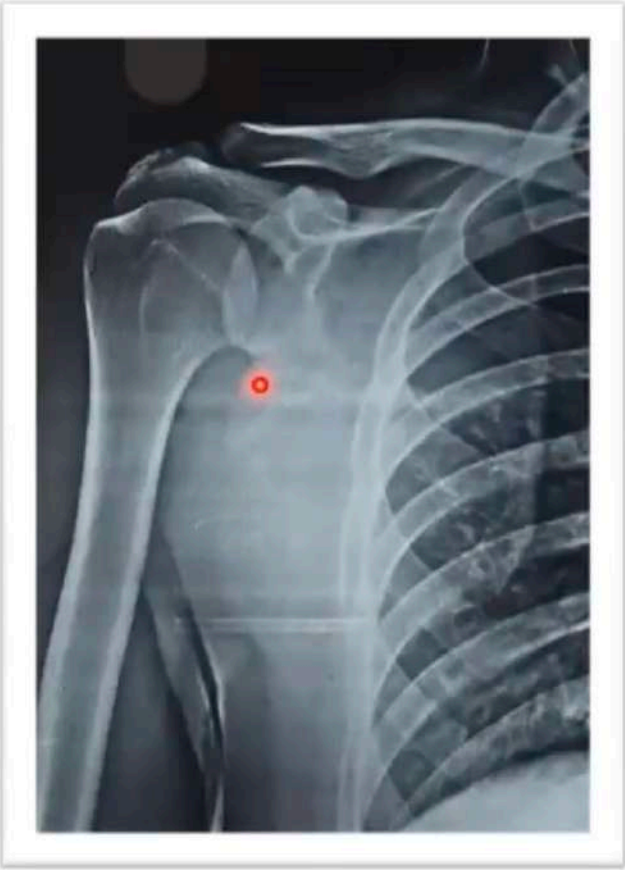
- PAIN/ SWELLING

- FEVER
- RAISED ESR/CRP
- RAISED TLC

RADIOLOGICAL EVALUATION

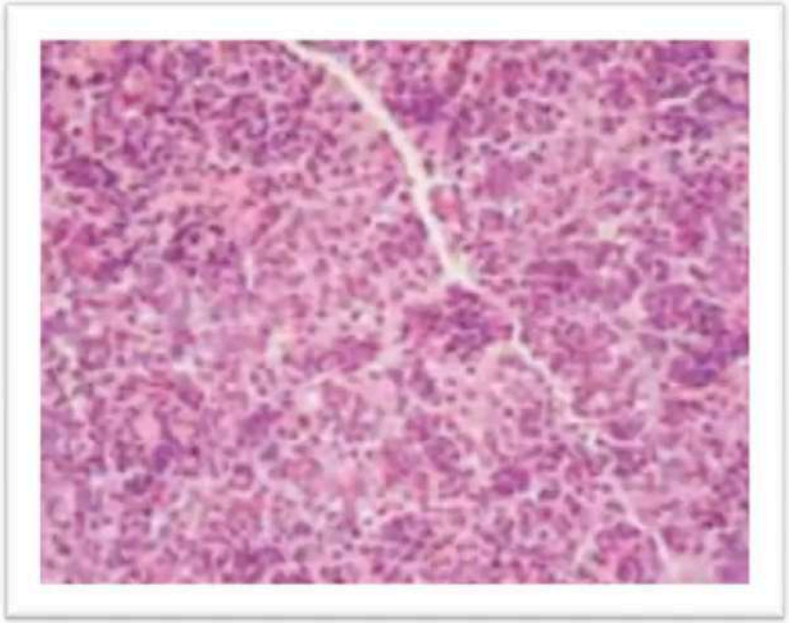
- **AGE** *SKELETALLY IMMATURE*
- **LOCATION OF TUMOUR** *METAPHYSEO DIAPHYSEAL*
- **TYPE OF LESION** *PERMEATIVE LYTIC*
- **MATRIX OF LESION** *NO MATRIX*
- **ZONE OF TRANSITION** *WIDE*
- **TYPE OF PERIOSTEAL REACTION** *ONION PEEL + CODMAN'S*
- **SOFT TISSUE COMPONENT** *CAN BE*

RADIOLOGICAL EVALUATION



NON SPECIFIC DESTRUCTIVE LESION IN FLAT BONES

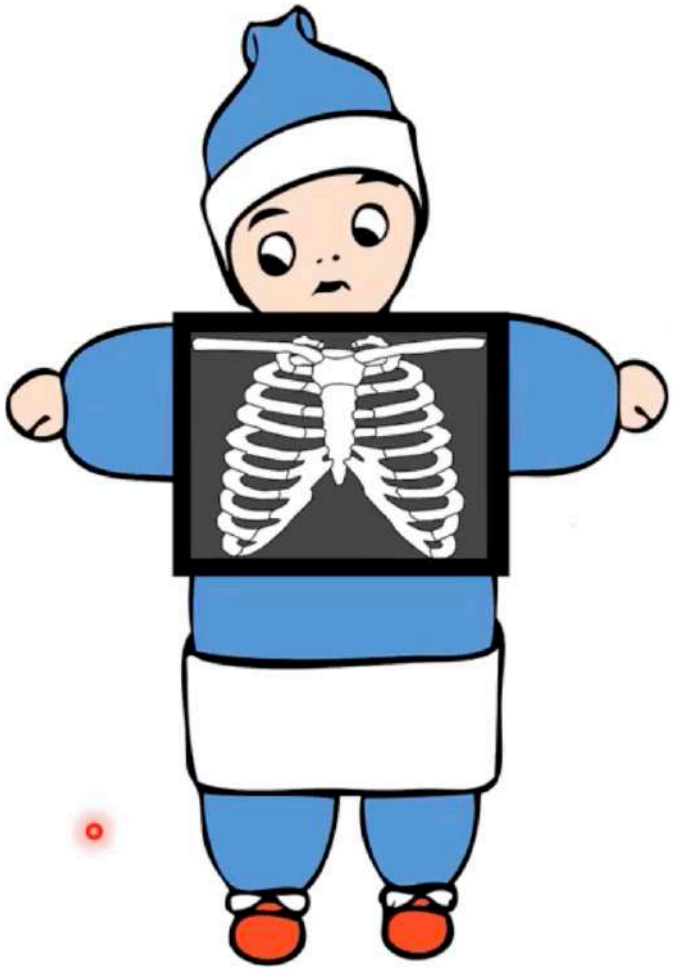
HISTOLOGICAL EVALUATION



- SMALL ROUND BLUE CELLS
- CD 99, MIC-2 POSITIVE
- PAS POSITIVE, RETICULIN NEGATIVE
- T 11,22 TRANSLOCATION

EWING SARCOMA

X-RAY



EWING SARCOMA

X-RAY

- EXTENT OF BONY DESTRUCTION

- ANY OBVIOUS OR IMPENDING FRACTURE

EWING SARCOMA

T MRI Y

EXTENT OF THE LESION

INVOLVEMENT OF SURROUNDING MUSCLE ETC

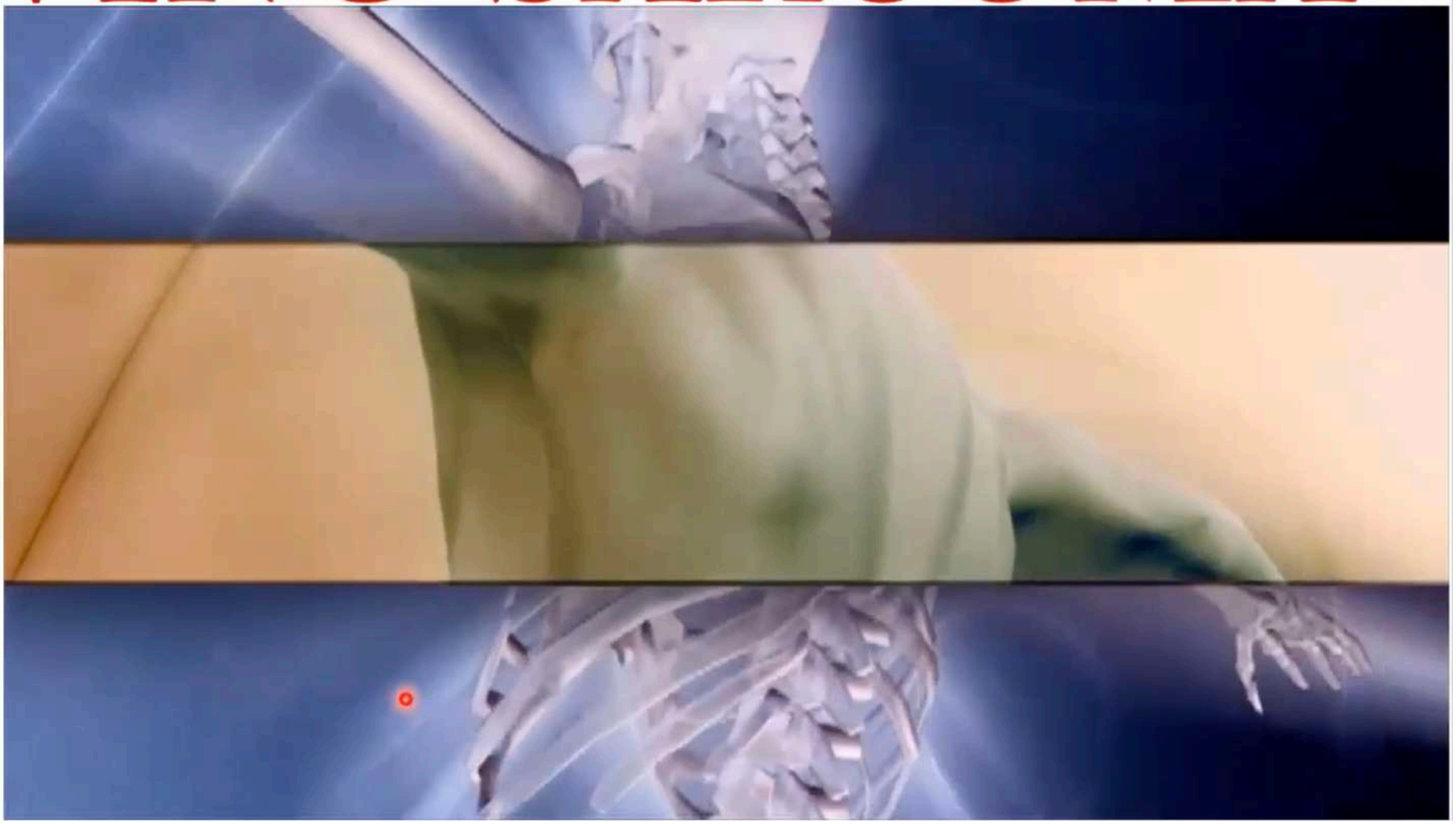
PLANNING BIOPSY / SURGERY

BONE CANCER CLINIC

TARGET ORTHO

EWING SARCOMA

PET CT



BONE CANCER CLINIC

TARGET ORTHO

EWING SARCOMA

PET CT

TO LOOK FOR DISEASE
ANYWHERE ELSE IN THE BODY

ASSESSMENT OF RESPONSE TO
TREATMENT

BONE CANCER CLINIC
TARGET ORTHO

EWING'S SARCOMA

PROGNOSTIC FACTORS

- ✓ STAGE OF TUMOUR
- ✓ SIZE OF TUMOUR
- ✓ LOCATION OF TUMOUR
- ✓ PRESENCE OF PATHOLOGICAL FRACTURE
- ✓ RESPONSE TO CHEMOTHERAPY
- ✓ MARGINS OF RESECTED SPECIMEN
- ✓ LAB VALUES
- ✓ AGE

~~GRADE~~

EWING'S SARCOMA

PROGNOSTIC FACTORS

- ✓ **STAGE OF TUMOUR**

Metastatic disease at presentation – worse prognosis

Bone metastasis has worse prognosis than lung metastasis

EWING'S SARCOMA

PROGNOSTIC FACTORS

More the tumour volume – worse is the prognosis

- ✓ **SIZE OF TUMOUR**

EWING'S SARCOMA

PROGNOSTIC FACTORS

Tumour in axial skeleton has worse prognosis than appendicular skeleton

- ✓ **LOCATION OF TUMOUR**

EWING'S SARCOMA

PROGNOSTIC FACTORS

Pathological fracture at presentation carries worse prognosis than patients without fracture

- ✓ **PRESENCE OF PATHOLOGICAL FRACTURE**

EWING'S SARCOMA

PROGNOSTIC FACTORS

Tumour progressing on chemotherapy or having poor response to chemotherapy has a worse prognosis

- ✓ **RESPONSE TO CHEMOTHERAPY**

EWING'S SARCOMA

PROGNOSTIC FACTORS

POSITIVE MARGINS HAVE WORSE PROGNOSIS

- ✓ **MARGINS OF RESECTED SPECIMEN**

EWING'S SARCOMA

PROGNOSTIC FACTORS

- **ESR**
- **LDH**
- **WBC**

HIGHER LEVELS ASSOCIATED WITH WORSE PROGNOSIS

✓ **LAB PARAMETERS**

EWING'S SARCOMA

TREATMENT PLAN

NEOADJUVANT

3 MONTHS

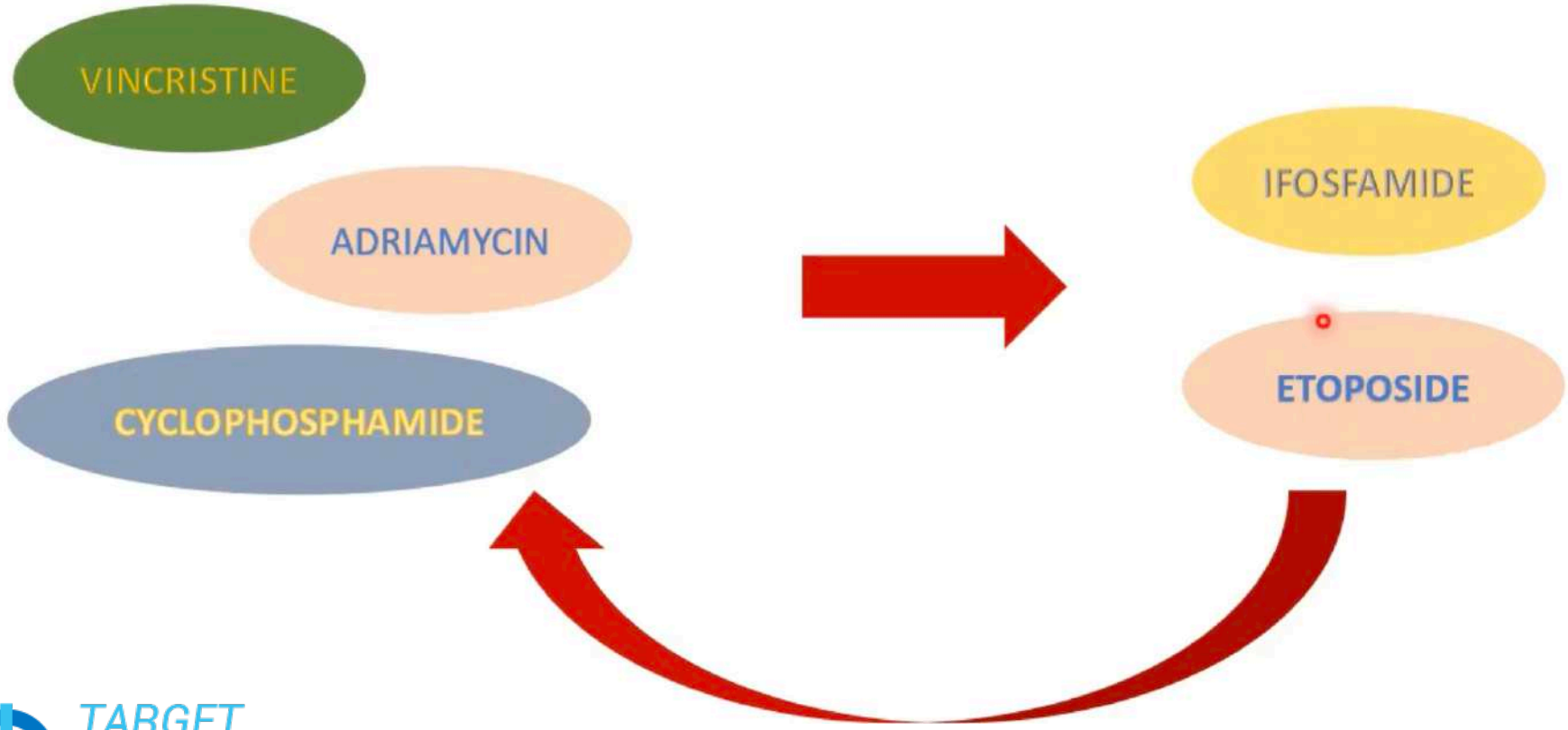
LIMB SALVAGE

ADJUVANT

6-8 MONTHS

EWING'S SARCOMA

CHEMOTHERAPY



EWING'S SARCOMA

RADIATION THERAPY

POSITIVE MARGINS

POOR RESPONSE TO CHEMOTHERAPY

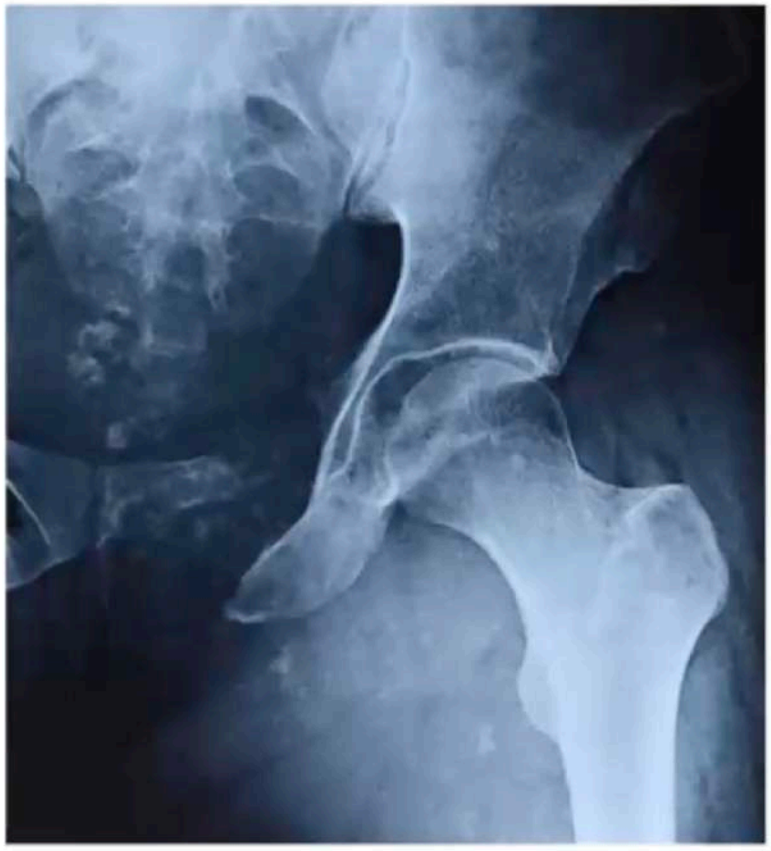
SURGICALLY UNRESECTABLE WITH WIDE MARGINS

CHONDROSARCOMA

- 2ND MOST COMMON NON HEMATOLOGIC PRIMARY BONE CANCER
- USUALLY PRESNTS >40 YEAR AGE
- SECONDARY CHONDROSARCOMA – 3RD – 5TH DECADE

- MOST COMMON PRIMARY MALIGNANCY OF HAND BONES

CHONDROSARCOMA



COMMONLY INVOLVES

- PELVIS
- PROXIMAL FEMUR
- PROXIMAL HUMERUS

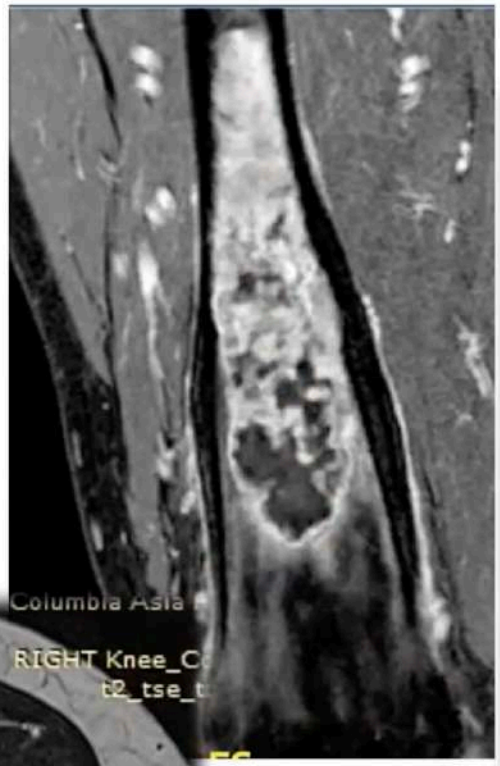
CHONDROSARCOMA

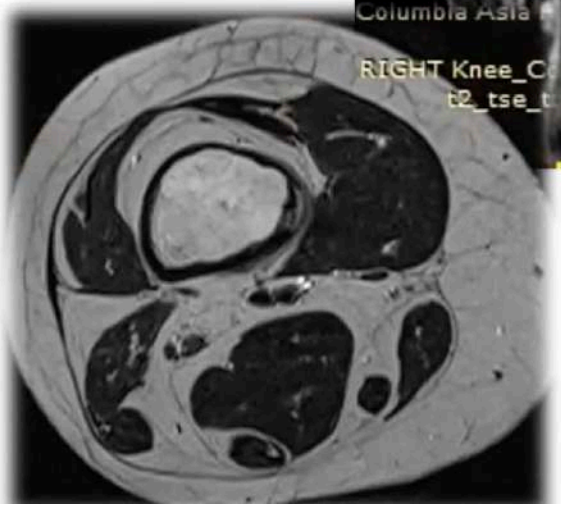
- SYMPTOMS MAY BE PRESENT FOR YEARS
- SLOW GROWING
- LOW GRADE CHONDROSARCOMA MAY BE PICKED UP INCIDENTALLY

CHONDROSARCOMA

MALIGNANT TRANSFORMATION IN A LONG BONE

- Expansion & cortical erosion
- Endosteal scalloping
- Size more than 5 cm
- Edema
- Soft tissue component





CHONDROSARCOMA

- PRIMARY
- SECONDARY
  - OSTEOCHONDROMA
  - ENCHONDROMA
  - PERIOSTEAL CHONDROMA
  - CHONDROMYXOID FIBROMA
  - SYNOVIAL CHONDROMATOSIS
- CLEAR CELL
- MESENCHYMAL

CHONDROSARCOMA

CLEAR CELL

- LOW GRADE MALIGNANCY
- EPIPHYSEAL
- MOST COMMONLY PROXIMAL FEMUR
- DIFFRENTIALS : Chondroblastoma / GCT
- BENIGN LOOKING RADIOGRAPHS

CHONDROSARCOMA

MESENCHYMAL

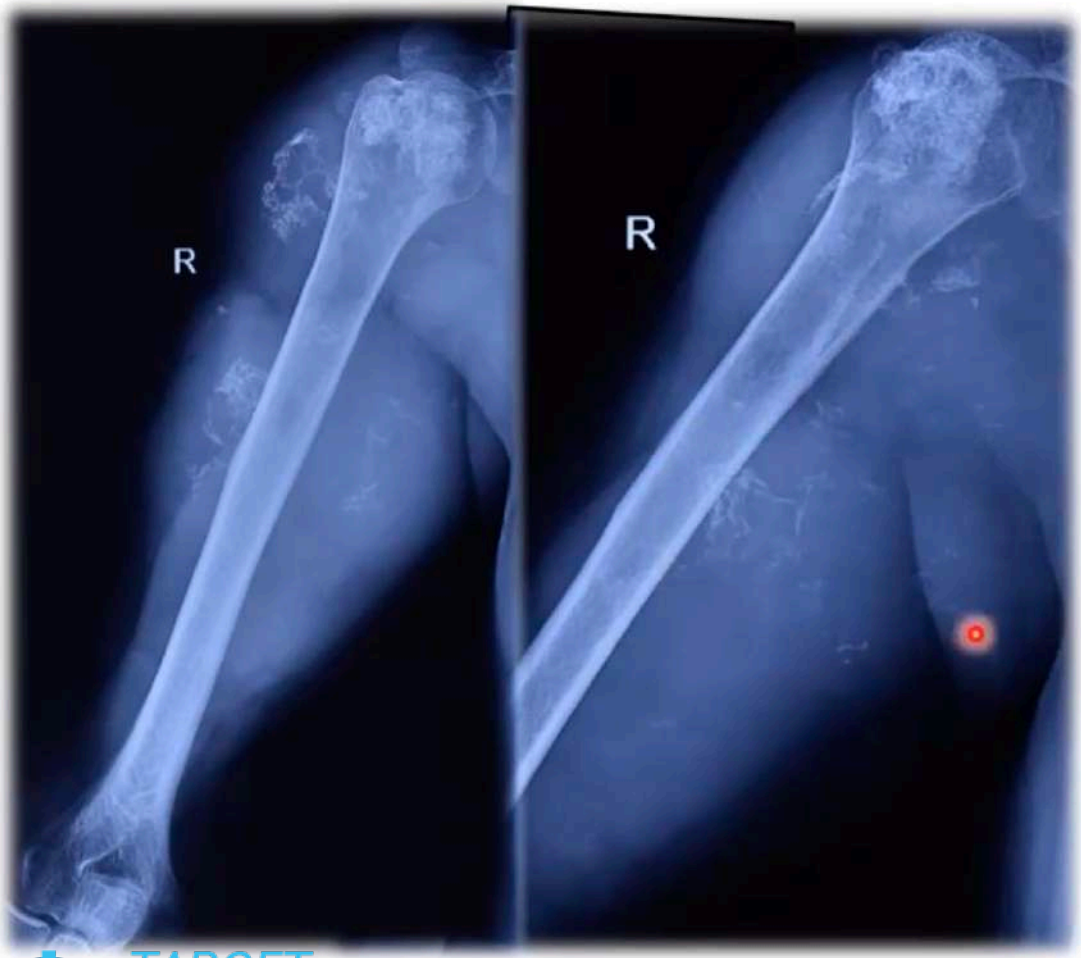
- VERY HIGH GRADE MALIGNANCY
- POORER PROGNOSIS
- SMALL ROUND BLUE CELLS ON HISTOLOGY
- DIFFRENTIALS : EWING'S SARCOMA
- REQUIRES CHEMOTHERAPY

CHONDROSARCOMA

DEDIFFRENTIATED

- HIGH GRADE MALIGNANCY
- POOR PROGNOSIS
- OCCURS IN CHONDROSARCOMA NEGLECTED FOR LONG
- DEDIFFRENTIATES INTO OSTEOSARCOMA COMMONLY
- MAY REQUIRE CHEMOTHERAPY

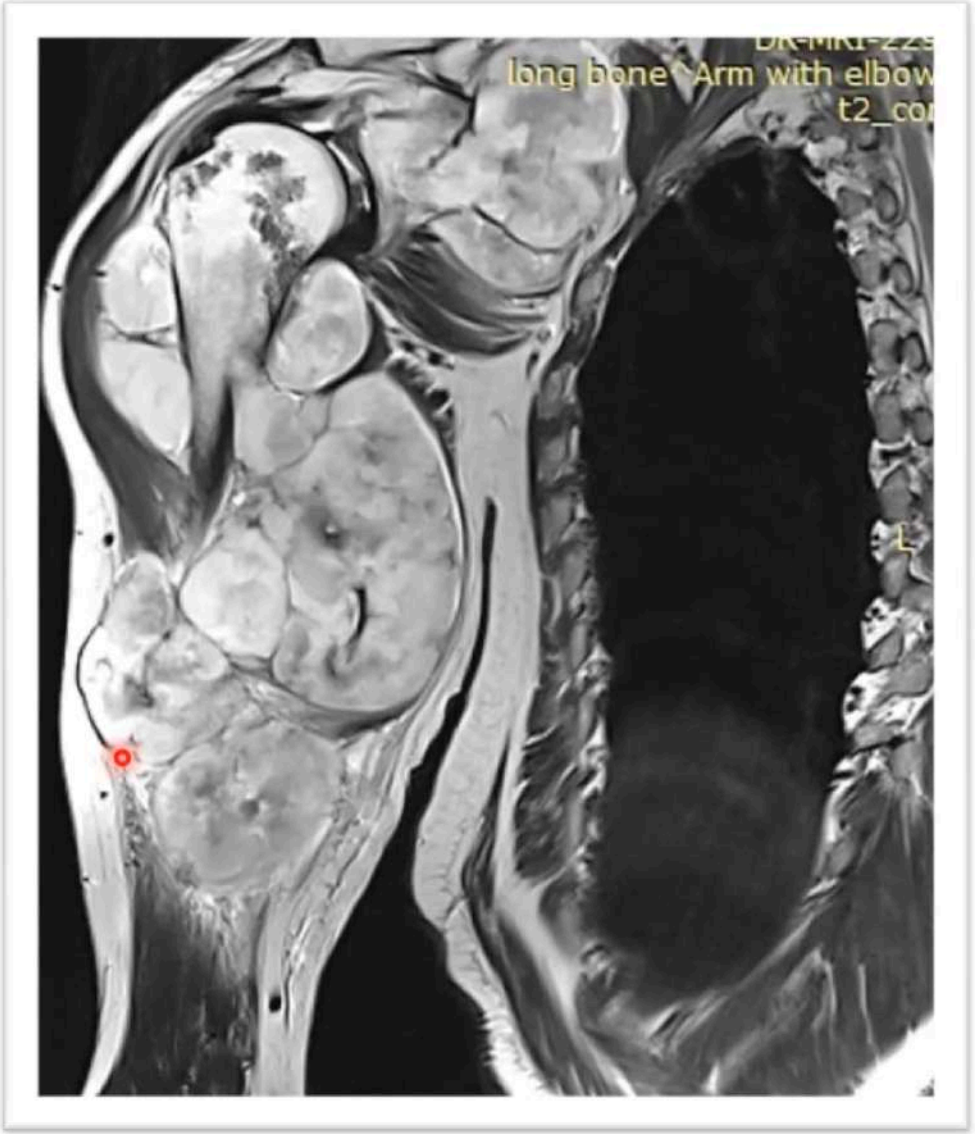
RADIOLOGICAL EVALUATION

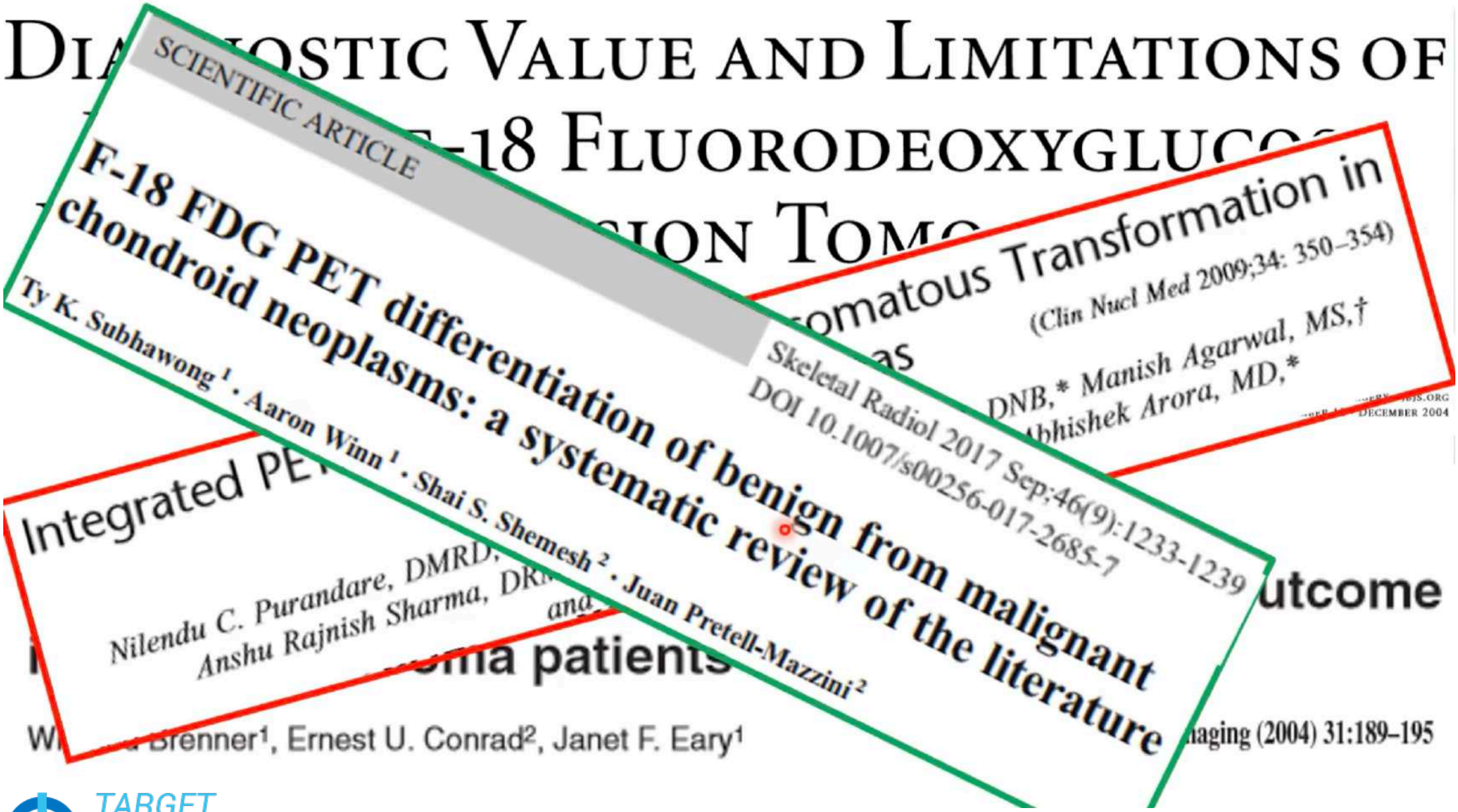


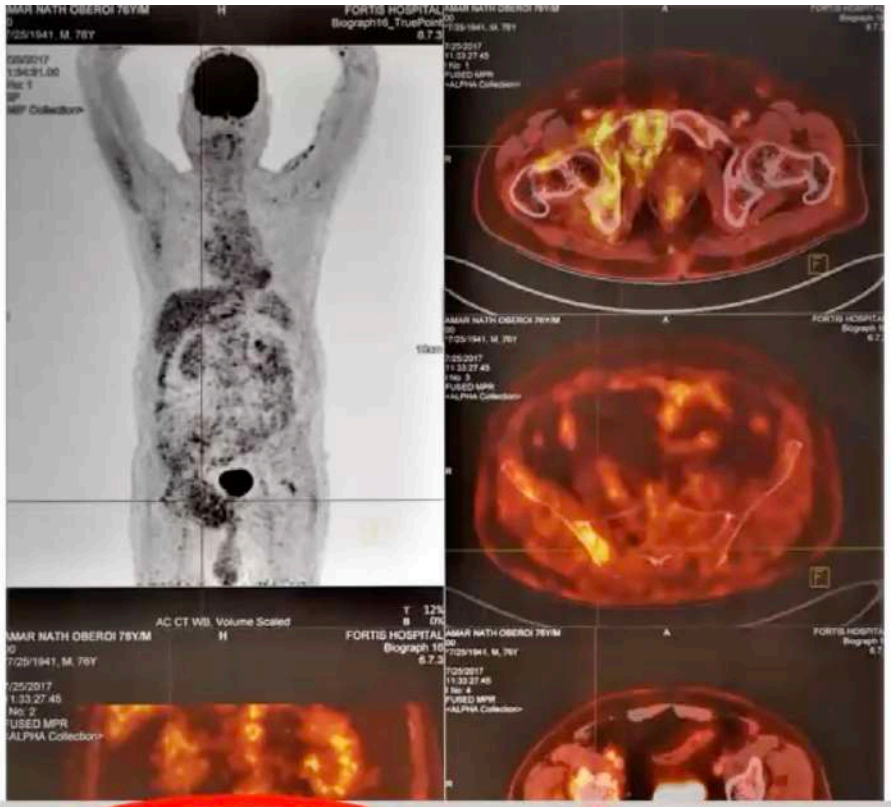
- **AGE** *SKELETALLY MATURE*
- **LOCATION OF TUMOUR** *METAPHYSEAL EXTENDING INTO EPIPHYSIS AND DIAPHYSIS*
- **TYPE OF LESION** *PERMEATIVE LYTIC*
- **MATRIX OF LESION** *POP CORN CALCIFICATION*
- **ZONE OF TRANSITION** *WIDE*
- **TYPE OF PERIOSTEAL REACTION** *ABSENT*
- **SOFT TISSUE COMPONENT** *MAYBE*

MRI

- T2 HYPERINTENSE LOBULATED LESION







The study reveals an FDG avid (SUVmax: 9.2) expansile osseous lesion seen arising from the right acetabulum and right pubic bone, with extensive extra osseous soft tissue component involving the adductor muscles of the right thigh and pathological fracture of the right inferior pubic ramus, measuring approximately 6.0 x 8.4 x 9.5 cm – suggestive of primary mitotic pathology.

Note is also made of hypermetabolic in the marrow of right ischium and right iliac bone – suspicious of involvement.

CHONDROSARCOMA

- SURGERY IS THE MAINSTAY OF TREATMENT
- NO ROLE OF RADIATION THERAPY
- NO ROLE OF CHEMOTHERAPY EXCEPT IN DEDIFFRENTIATED OR MESENCHYMAL VARIANTS

CHONDROSARCOMA

SURGERY ??

WIDE LOCAL RESECTION

EXTENDED CURETTAGE FOR GRADE 1 TUMOURS

THE BONE & JOINT JOURNAL

■ ONCOLOGY

How safe is curettage of low-grade cartilaginous neoplasms diagnosed by imaging with or without pre-operative needle biopsy?

M. T. Brown,
P. D. Gikas,
J. S. Bhamra,
J. A. Skinner,
W. J. S. Aston,
R. C. Pollock,
A. Saifuddin,
T. W. R. Briggs

From London Bone and Soft Tissue Sarcoma Service, Royal National Orthopaedic Hospital, Stanmore, United Kingdom

■ M. T. Brown, MB BS, BSc (Hons), MRCS (Eng), Specialist Registrar
■ P. D. Gikas, MB BS (Hons), FRCS, MD, Specialist Registrar
■ J. S. Bhamra, MB BS, BSc (Hons), MRCS (Eng), Clinical

The pre-operative differentiation between enchondroma, low-grade chondrosarcoma and high-grade chondrosarcoma remains a diagnostic challenge. We reviewed the accuracy and safety of the radiological grading of cartilaginous tumours through the assessment of, first, pre-operative radiological and post-operative histological agreement, and second the rate of recurrence in lesions confirmed as high-grade on histology. We performed a retrospective review of major long bone cartilaginous tumours managed by curettage as low grade between 2001 and 2012. A total of 53 patients with a mean age of 47.6 years (8 to 71) were included. There were 23 men and 30 women. The tumours involved the femur (n = 20), humerus (n = 18), tibia (n = 9), fibula (n = 3), radius (n = 2) and ulna (n = 1). Pre-operative diagnoses resulted from multidisciplinary consensus following radiological review alone for 35 tumours, or with the addition of pre-operative image guided needle biopsy for 18. The histologically confirmed diagnosis was enchondroma for two (3.7%), low-grade chondrosarcoma for 49 (92.6%) and high-grade chondrosarcoma for two (3.7%). Three patients with a low-grade tumour developed a local recurrence at a mean of 15 months (12 to 17) post-operatively. A single high-grade recurrence (grade II) was treated with tibial diaphyseal replacement. The overall recurrence rate was 7.5% at a mean follow-up of 4.7 years (1.2 to 12.3). Cartilaginous tumours identified as low-grade on pre-operative imaging with or without additional image-guided needle biopsy can safely be managed as low-grade without pre-operative histological diagnosis. A few tumours may demonstrate high-grade features histologically, but the rates of recurrence are not affected.

Cite this article: *Bone Joint J* 2014; 96-B:1098–105.

Mermerkaya *et al. World Journal of Surgical Oncology* 2014, **12**:336
http://www.wjso.com/content/12/1/336

WORLD JOURNAL OF SURGICAL ONCOLOGY

Intralesional curettage and cementation for low-grade chondrosarcoma of long bones: retrospective study and literature review

Clin Orthop Relat Res (2010) 468:2765–2773
DOI 10.1007/s11999-010-1445-y

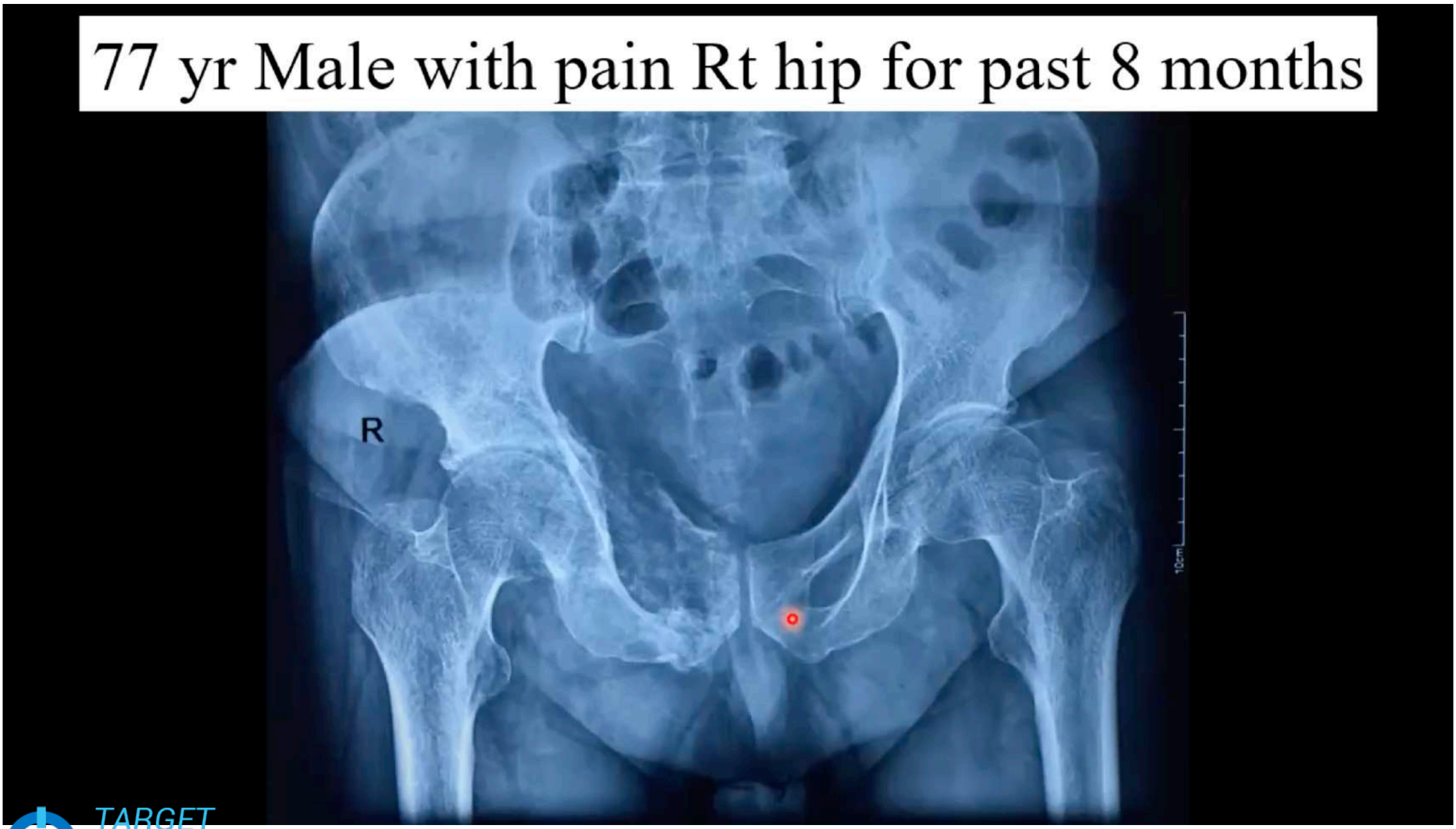
CLINICAL RESEARCH

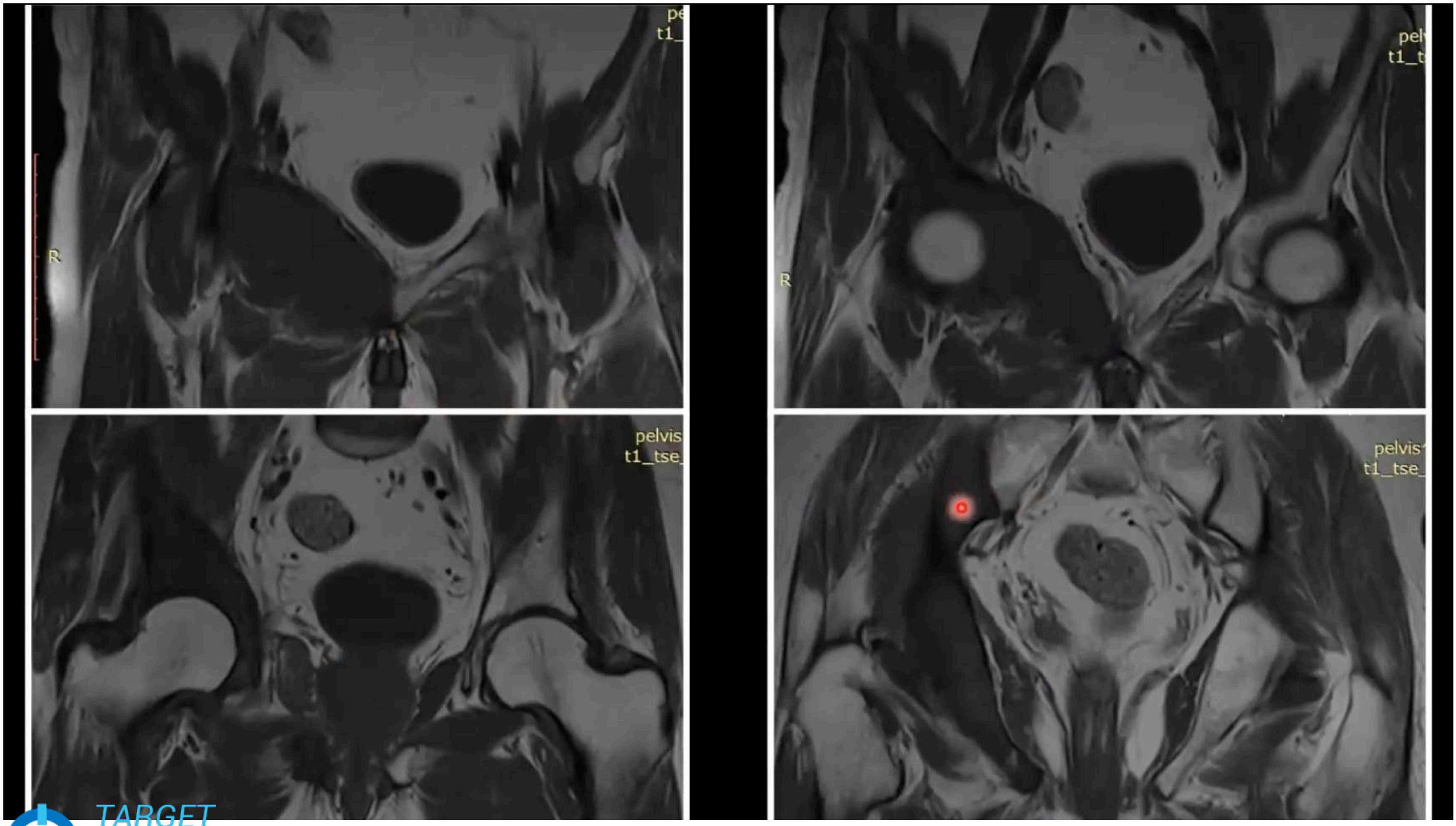
Curettage and Cryosurgery for Low-grade Cartilage Tumors Is Associated with Low Recurrence and High Function

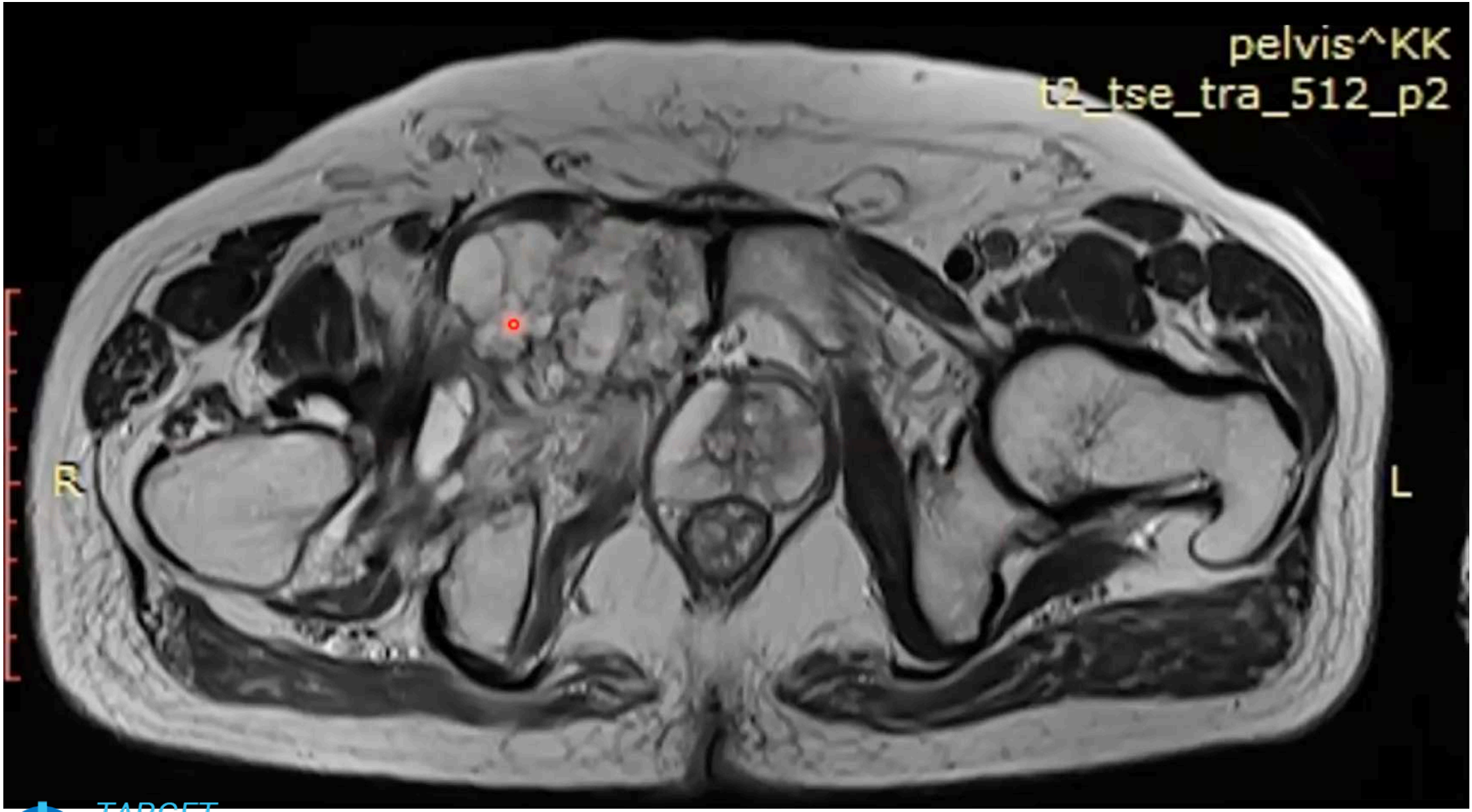
David G. Mohler MD, Richard Chiu MS, David A. McCall MD, Raffi S. Avedian MD

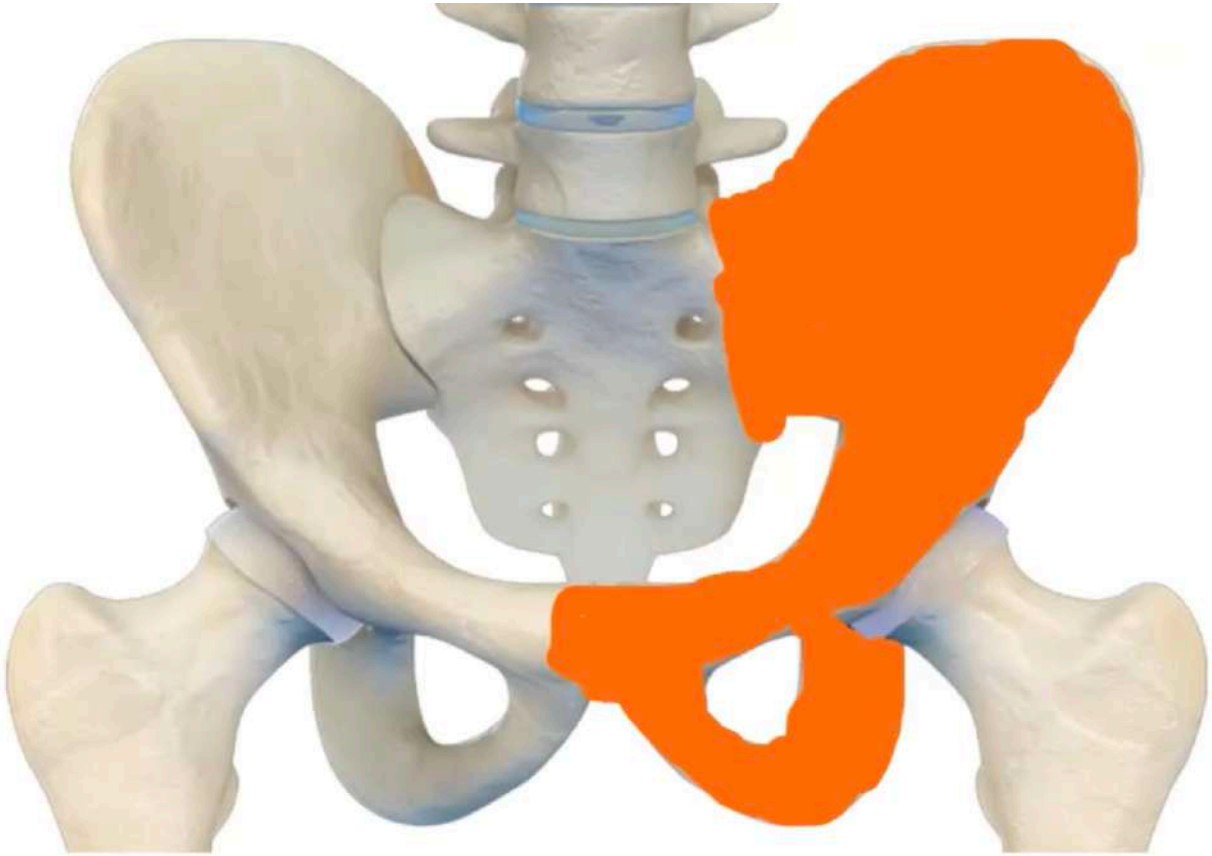
LOW GRADE CHONDROSARCOMA MANAGED WITH EXTENDED CURETTAGE PLUS CEMENTING

77 yr Male with pain Rt hip for past 8 months





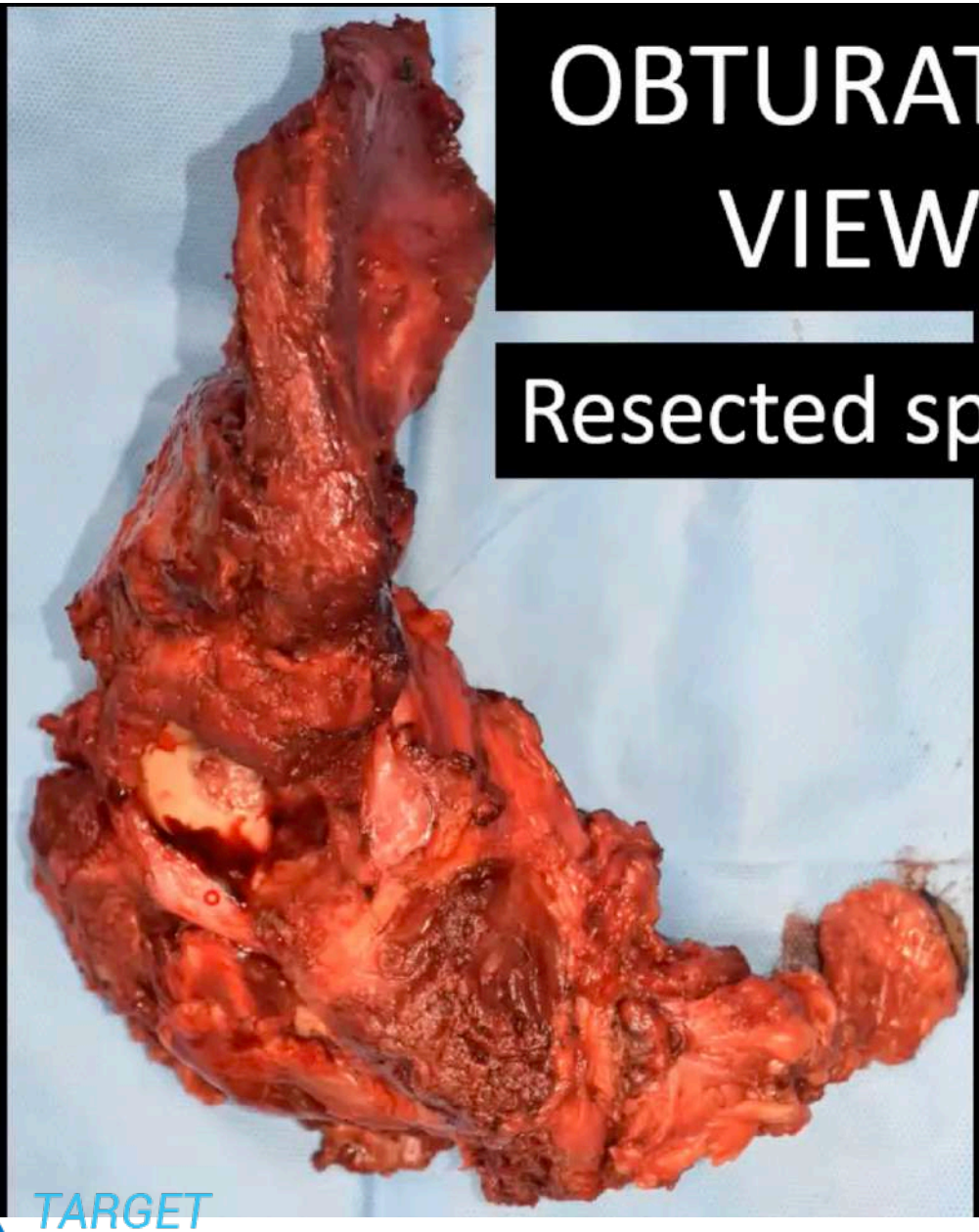


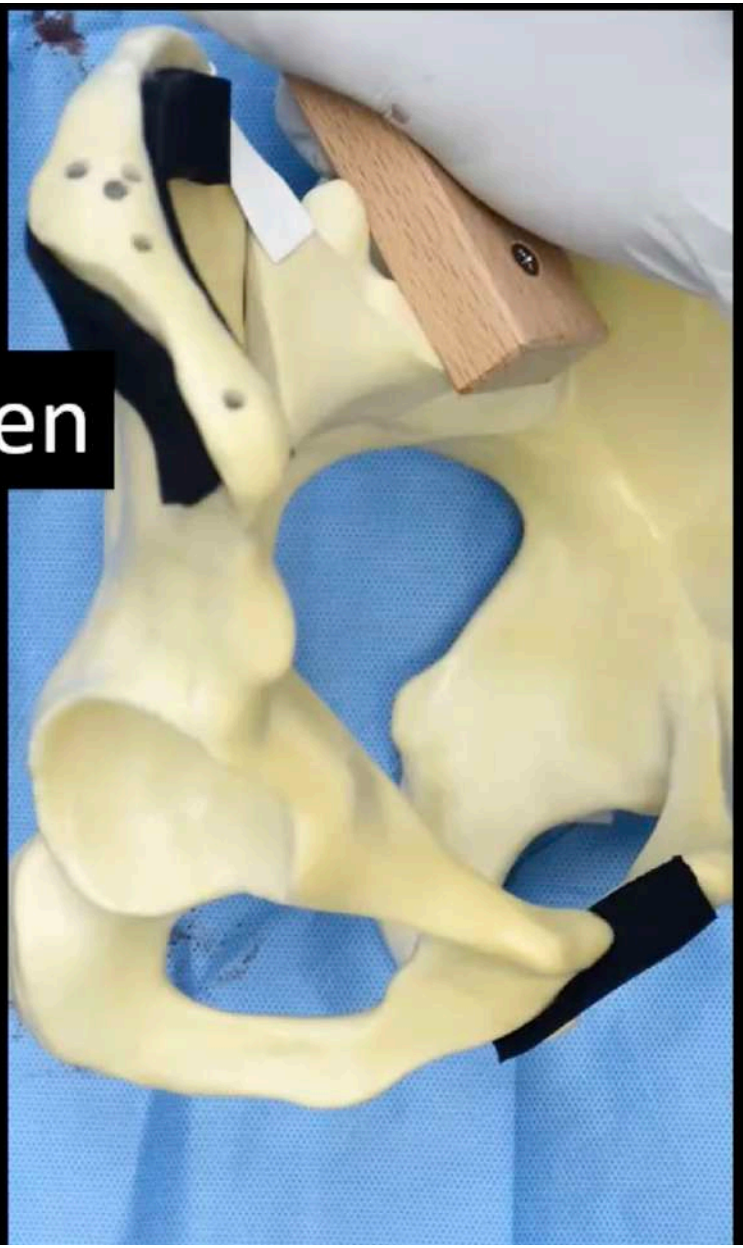


EXTENDED TYPE 1+2+3 INTERNAL HEMIPELVICECTOMY

OBTURATOR VIEW

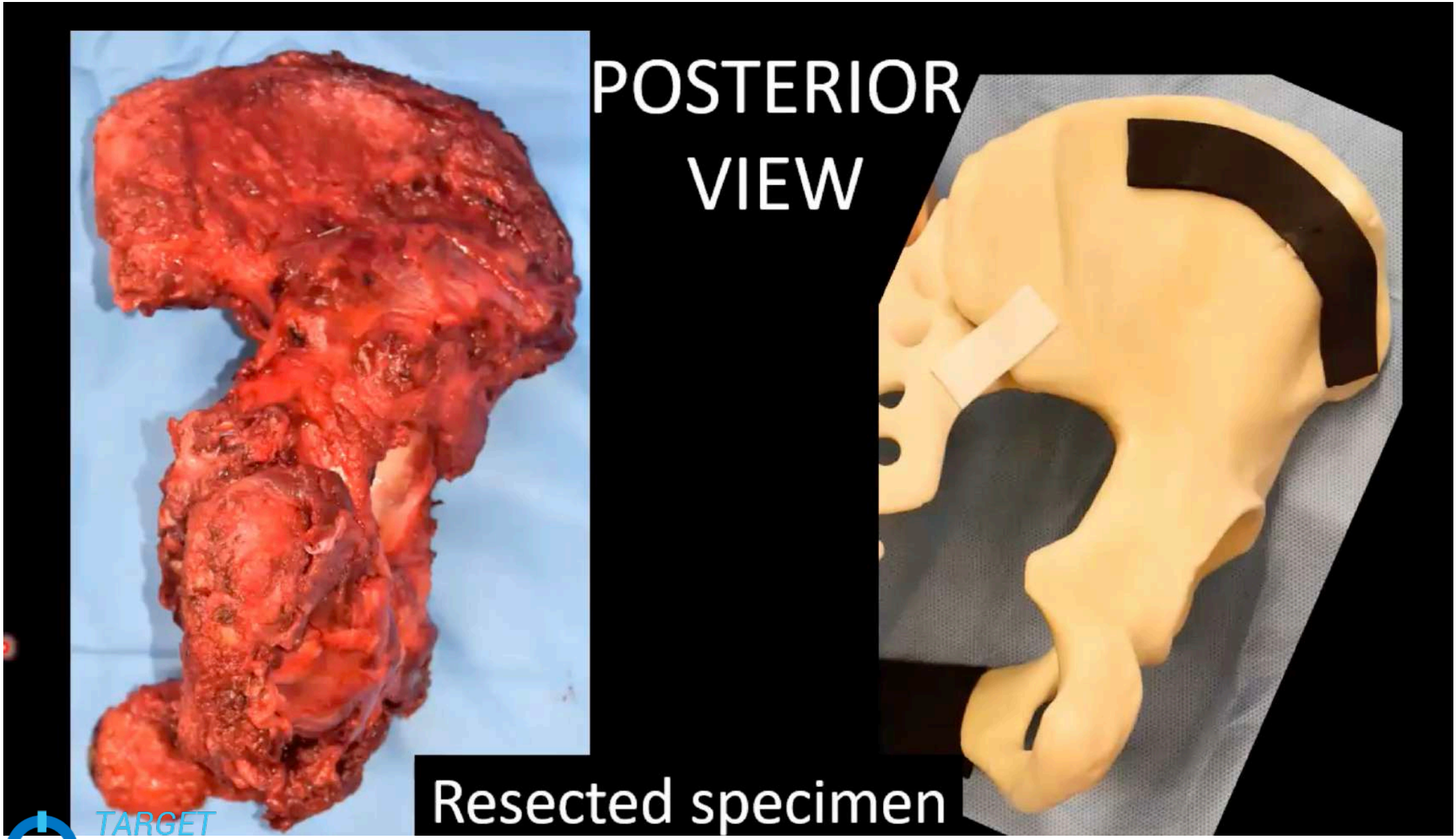
Resected specimen





ILIAC VIEW

Resected specimen

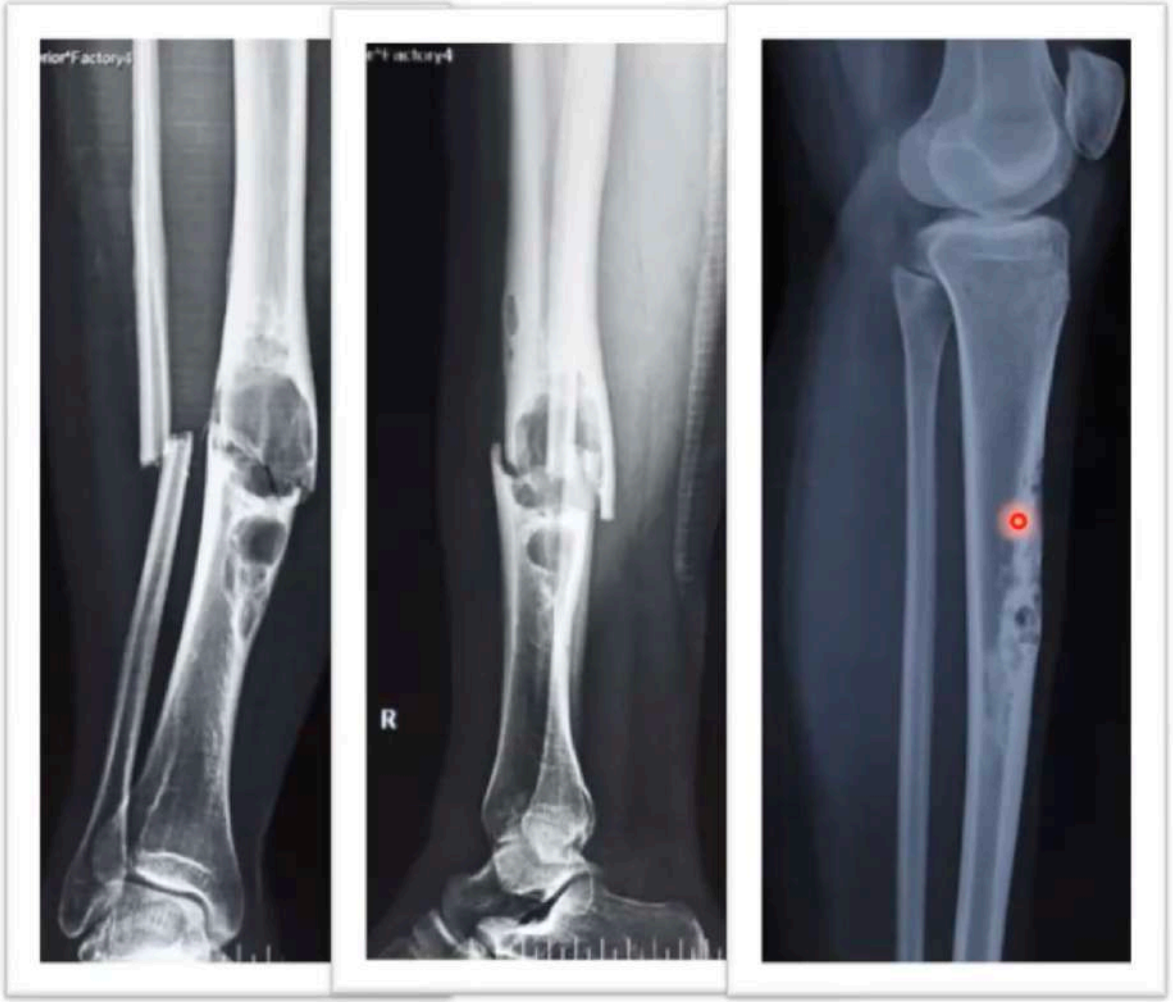


ADAMANTINOMA

- ARISES FROM ABERRANT EPITHELIAL CELL NESTS
- MOST COMMON IN TIBIA
- 3RD DECADE
- MALES

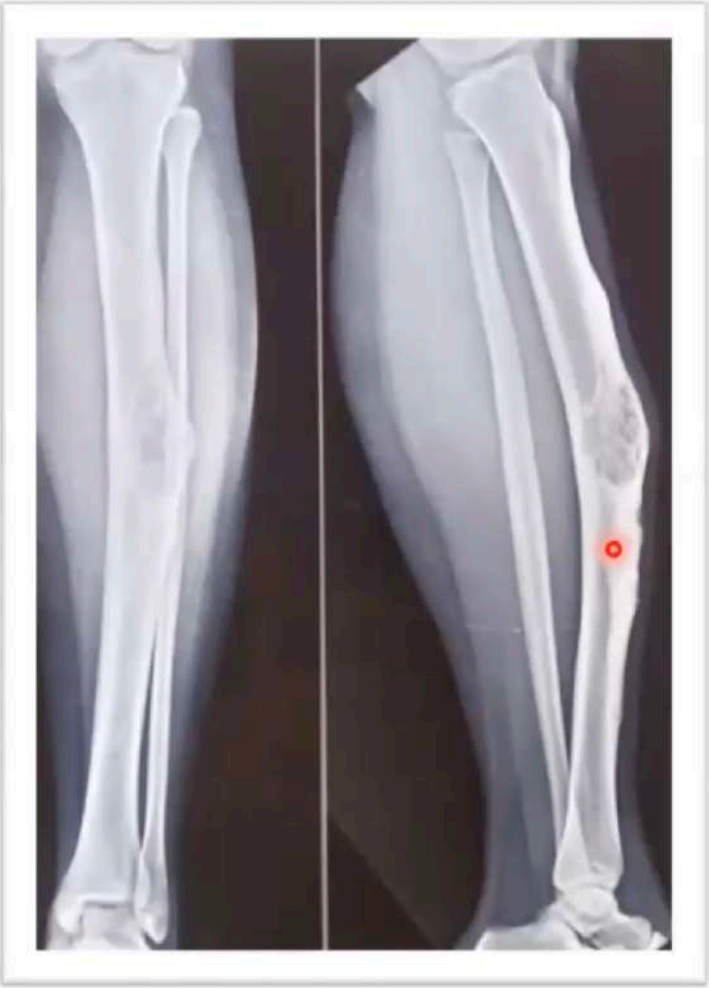
ADAMANTINOMA

- MULTIPLE SHARPLY DEMARCATED LESIONS
- SEPARATED BY DENSE SCLEROTIC BONE
- DIAPHYSEAL



ADAMANTINOMA

- IHC : +VE FOR CYTOKERATIN
- LOW GRADE MALIGNANCY



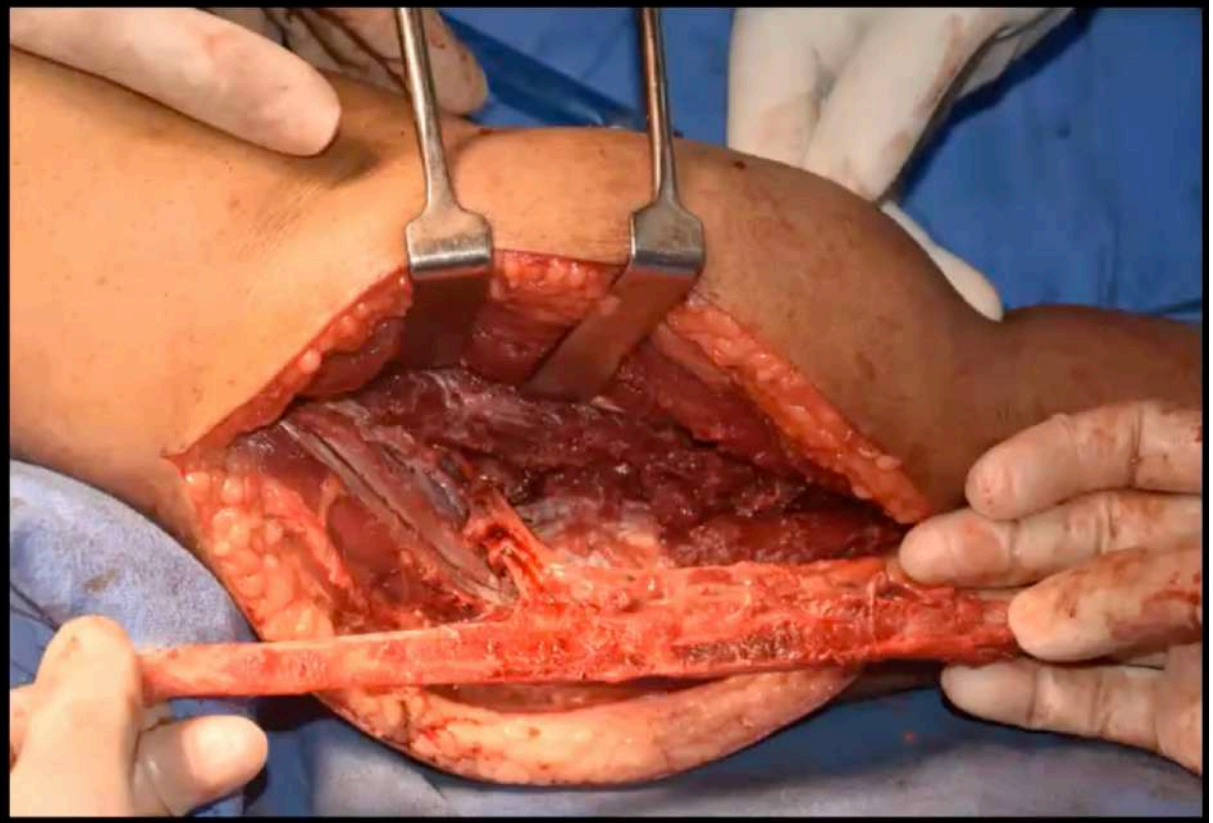
ADAMANTINOMA

- MULTIPLE SHARPLY DEMARCATED LESIONS
- SEPARATED BY DENSE SCLEROTIC BONE
- DIAPHYSEAL
- COMMONEST DIFFRENTIAL : OFD

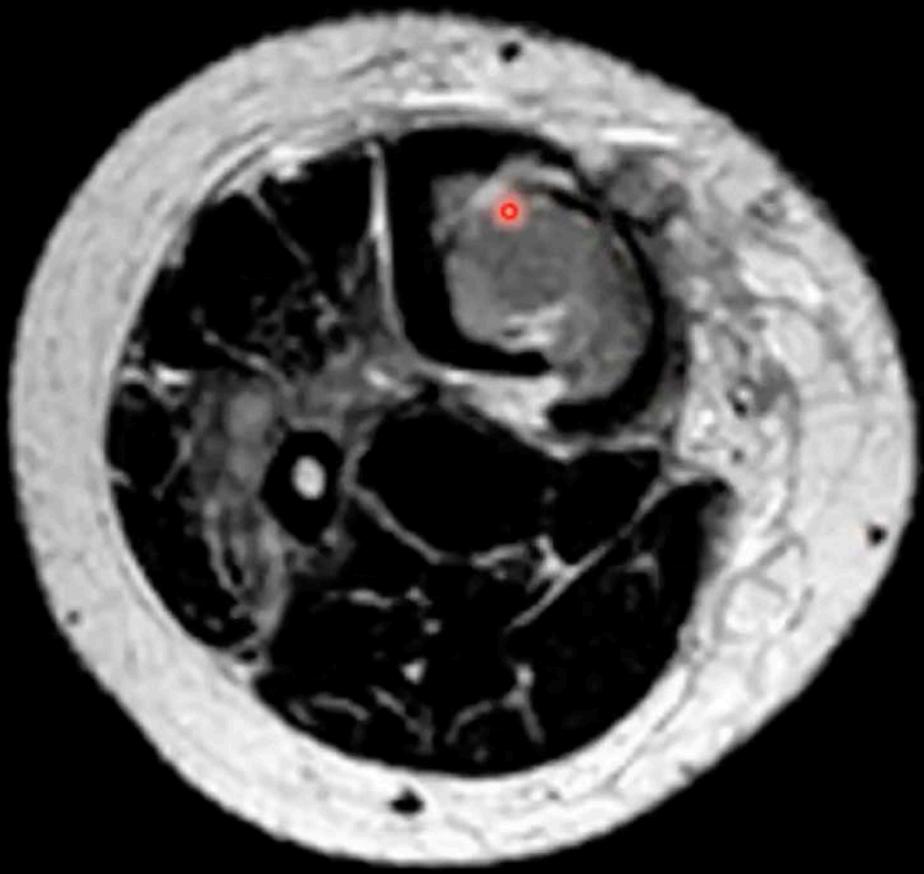
ADAMANTINOMA

- IHC : +VE FOR CYTOKERATIN
- LOW GRADE MALIGNANCY
- WIDE RESECTION IS THE TREATMENT
- NO ROLE OF CHEMOTHERAPY OR RADIOTHERAPY

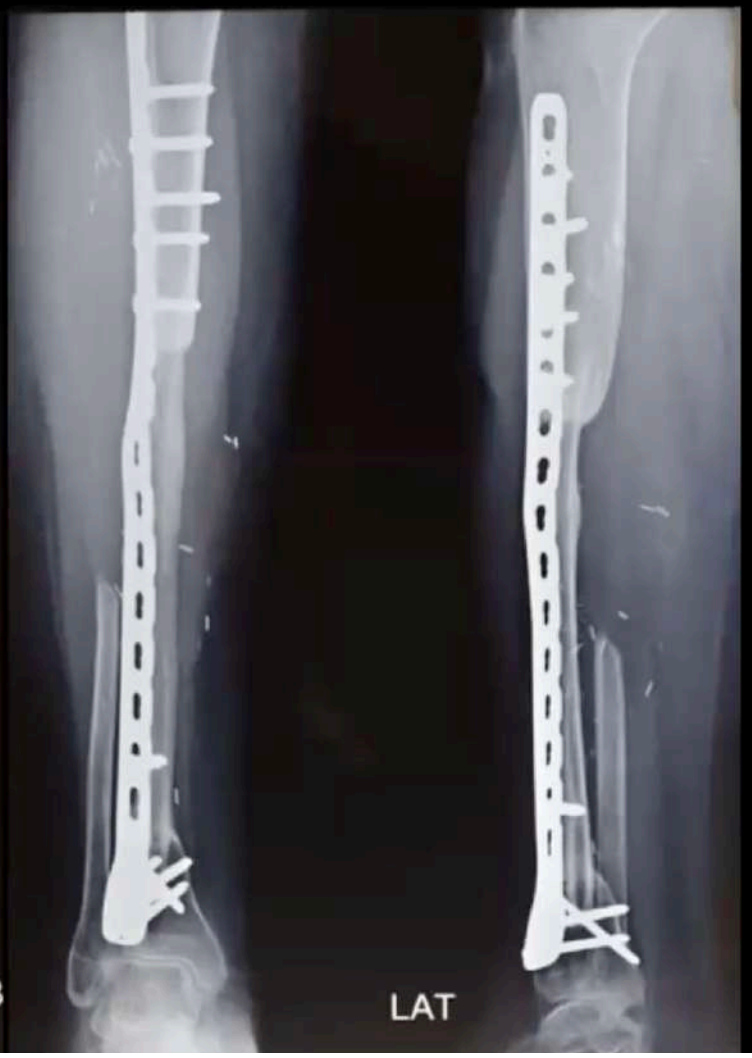
INTERCALARY RESECTION TIBIA + I/L VASCULARISED FIBULA TRANSFER



16Y/M NON METASTATIC ADAMANTINOMA TIBIA WITH PATHOLOGICAL FRACTURE

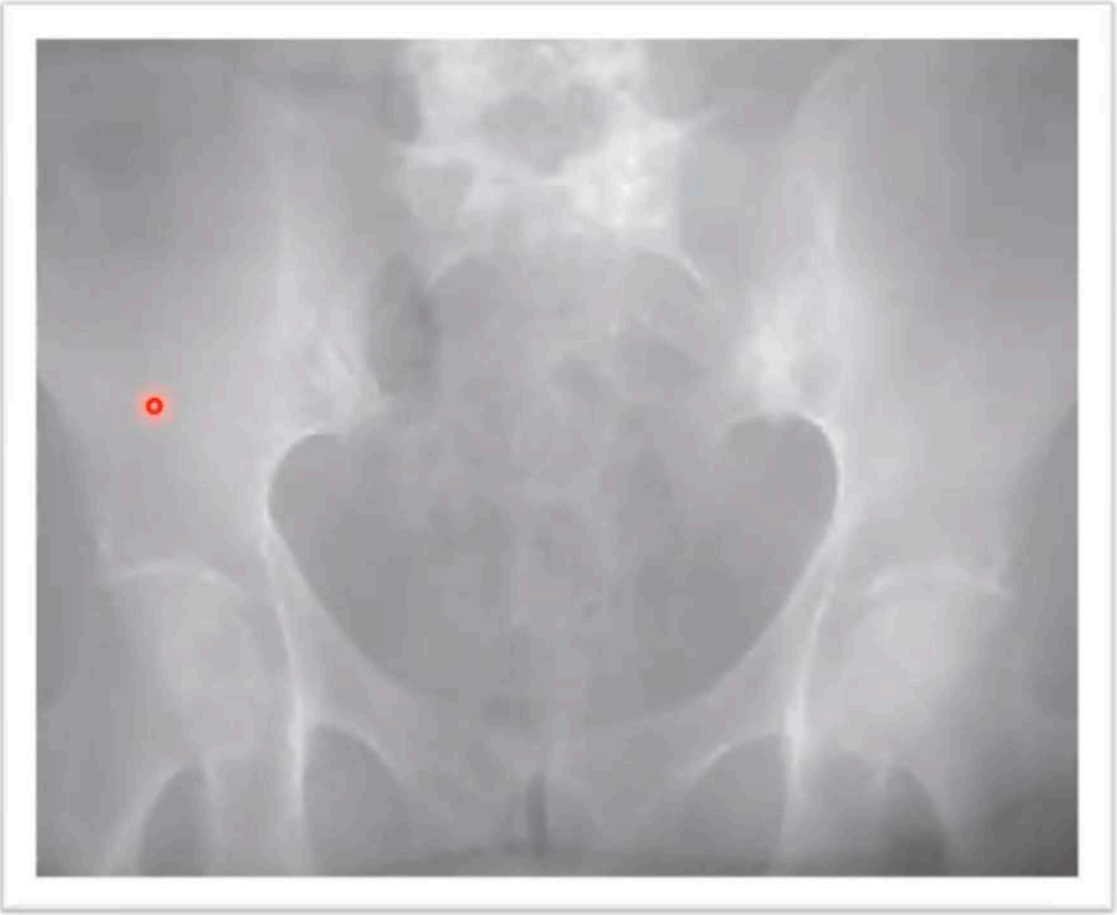


30 MONTHS FOLLOW UP



CHORDOMA

- MOST COMMON PRIMARY SACRAL MALIGNANCY
- SECOND MOST COMMON PRIMARY MALIGNANCY OF SPINE
- USUALLY IN 40-60 YEARS
- SACROCOCCYGEAL > SPHENOCCIPITAL > SPINE
- LOW GRADE MALIGNANCY



CHORDOMA

- LONG STANDING PAIN & SYMPTOMS OF NEURAL COMPRESSION
- ARISE FROM MIDLINE
- MAY HAVE CALCIFICATION
- RESECTION IS THE TREATMENT
- RADIORESISTANT & CHEMORESISTANT