Management of Extremity Sarcomas

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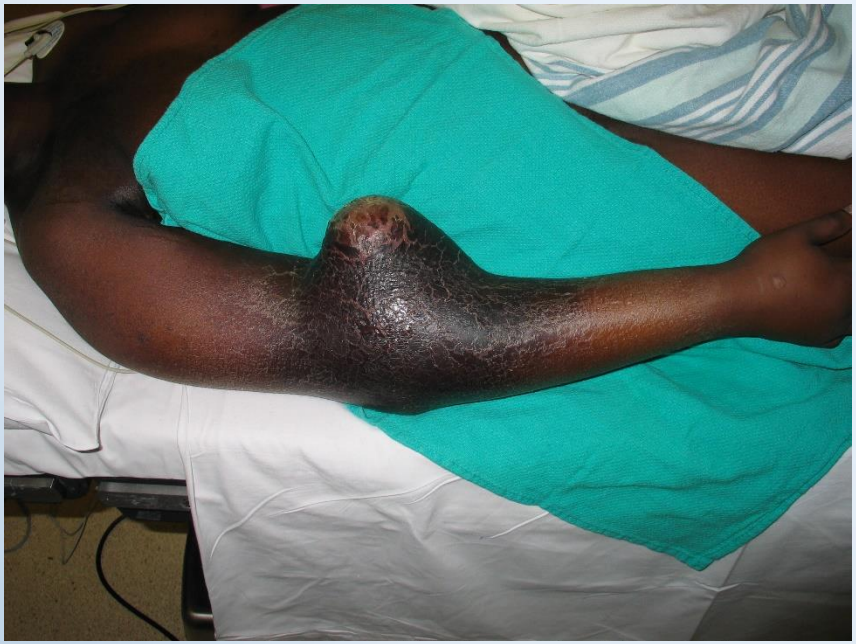
Toronto Orthopaedics
Leadership. Innovation. Impact.

Declarations

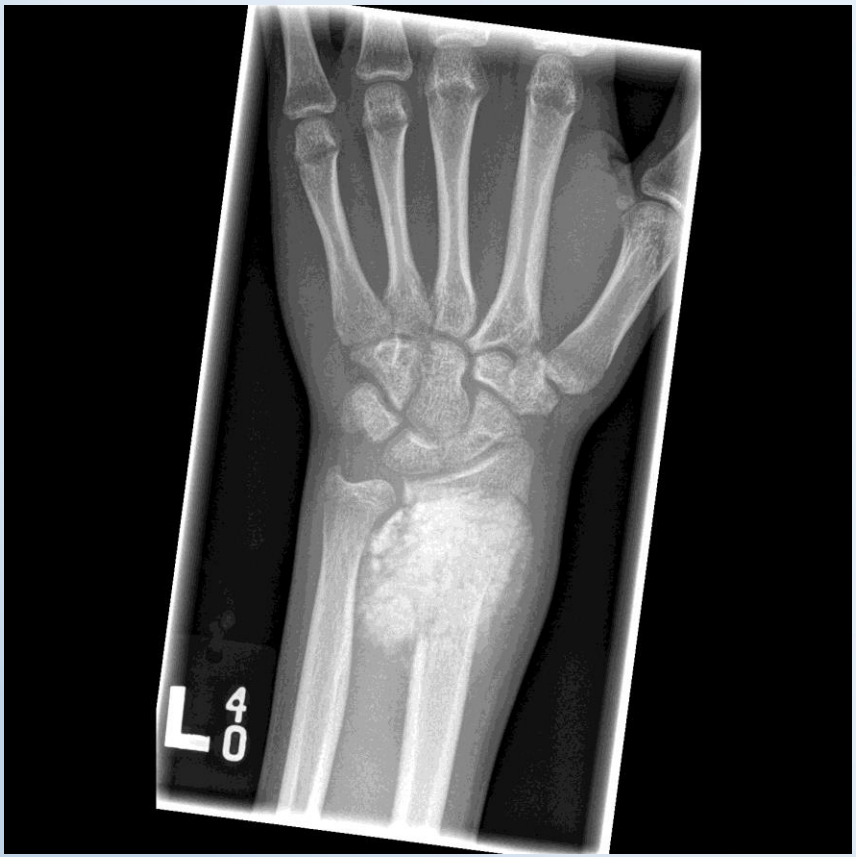
- none

Case 1



- 23 year old female
- Right hand dominant
- 1 year history of soft tissue mass in right antecubital fossa
- Swelling in right hand
- Neurovascularly intact
- Mass is mobile over bone

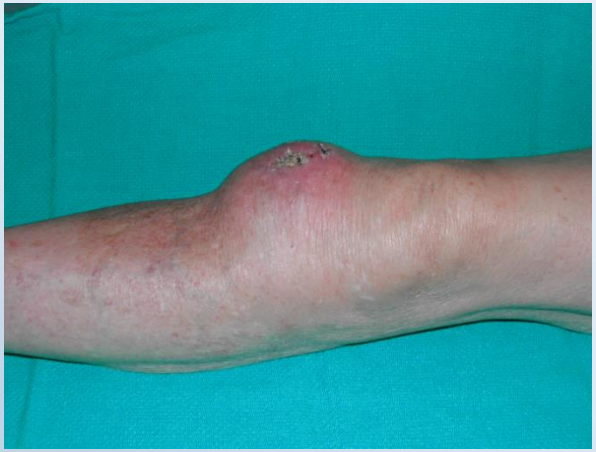
Case 2

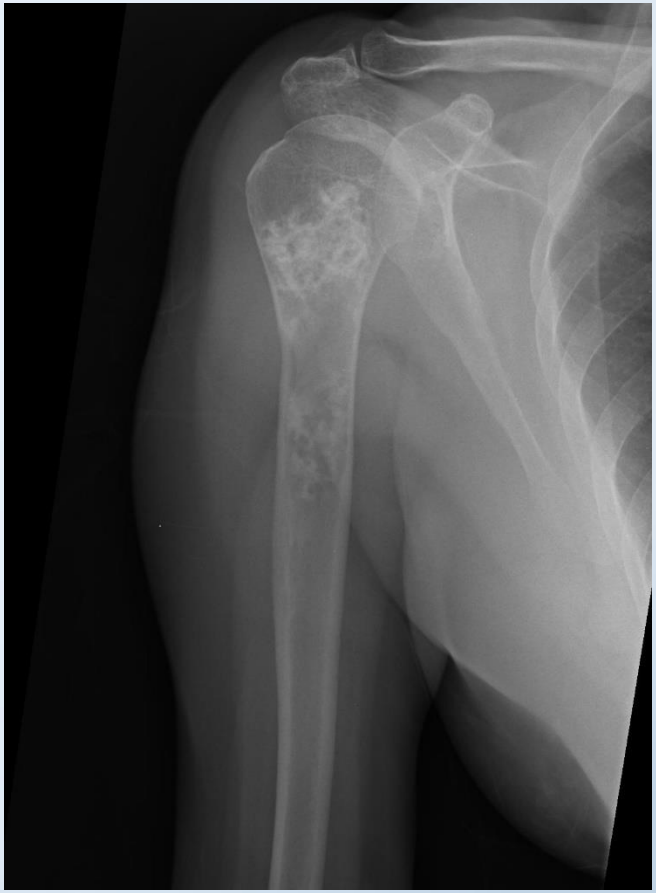


- 16 year old male
- 4 week history of pain and swelling in left wrist
- Night pain
- Large, firm soft tissue mass fixed to bone
- No constitutional symptoms

Presentation of extremity sarcomas

- Pain
- Soft tissue mass
- Pathologic fracture
- Incidental finding





Staging

Bone Sarcomas

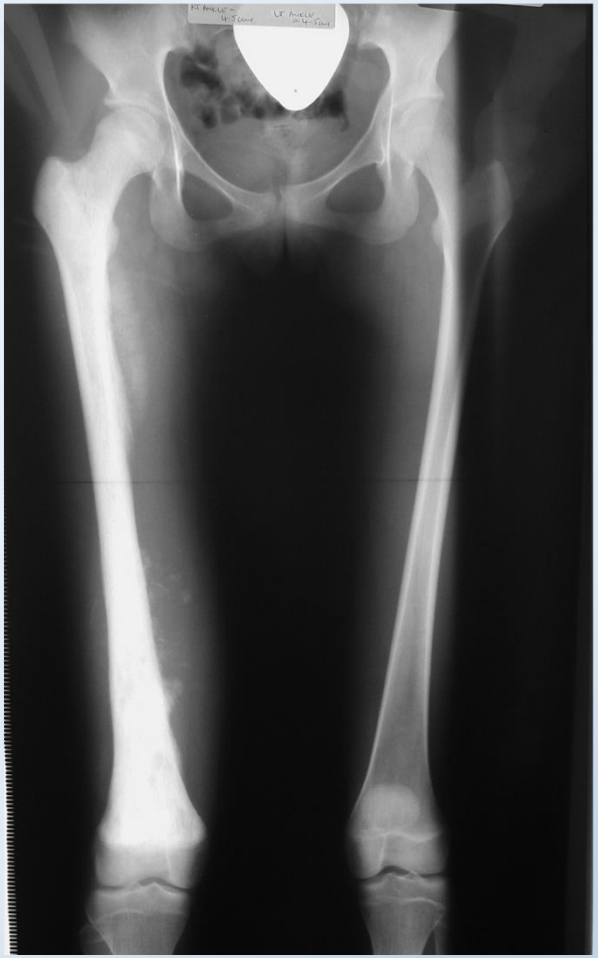
- Plain radiographs
- MRI of entire bone
- CT thorax
- Total body bone scan
- ALP, LDH in **osteosarcoma/Ewing**
- ? PET

Soft Tissue Sarcomas

- MRI of mass
- CT thorax
- Total body MRI in **myxoid liposarcoma**
- Imaging of lymph nodes in **clear cell sarcoma, angiosarcoma, rhabdomyosarcoma, epithelioid sarcoma, extraskeletal myxoid chondrosarcoma**
- ? PET

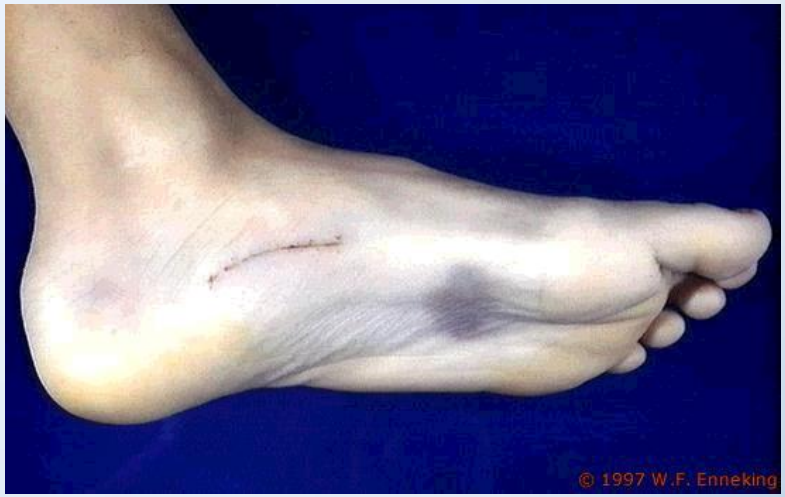
Biopsy – bone sarcoma

- Confer with treating surgeon
- image guided **core needle** biopsy
- Ultrasound guided if soft tissue mass
- CT guided if intraosseus
- Must be reviewed at host sarcoma site by sarcoma pathologist

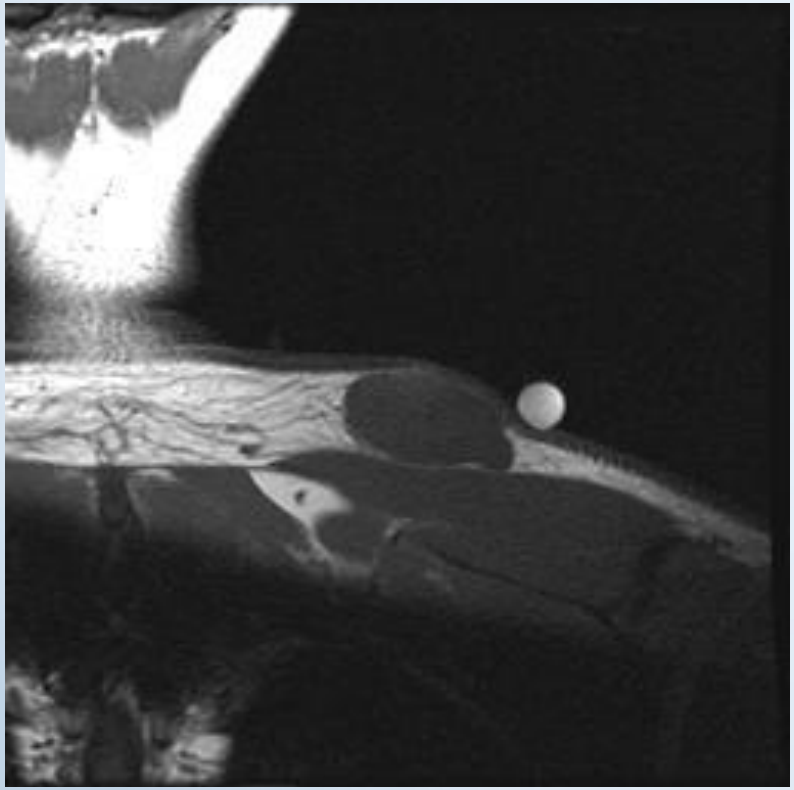


Biopsy – soft tissue sarcoma

- Confer with treating surgeon
- > 5 cm – **core needle biopsy**
- Deep to fascia - **core needle biopsy**
- Adjacent to critical structures (vessels, nerve, bone) – **core needle biopsy**
- Otherwise can do **excisional biopsy**
- Must be reviewed at host sarcoma site by sarcoma pathologist

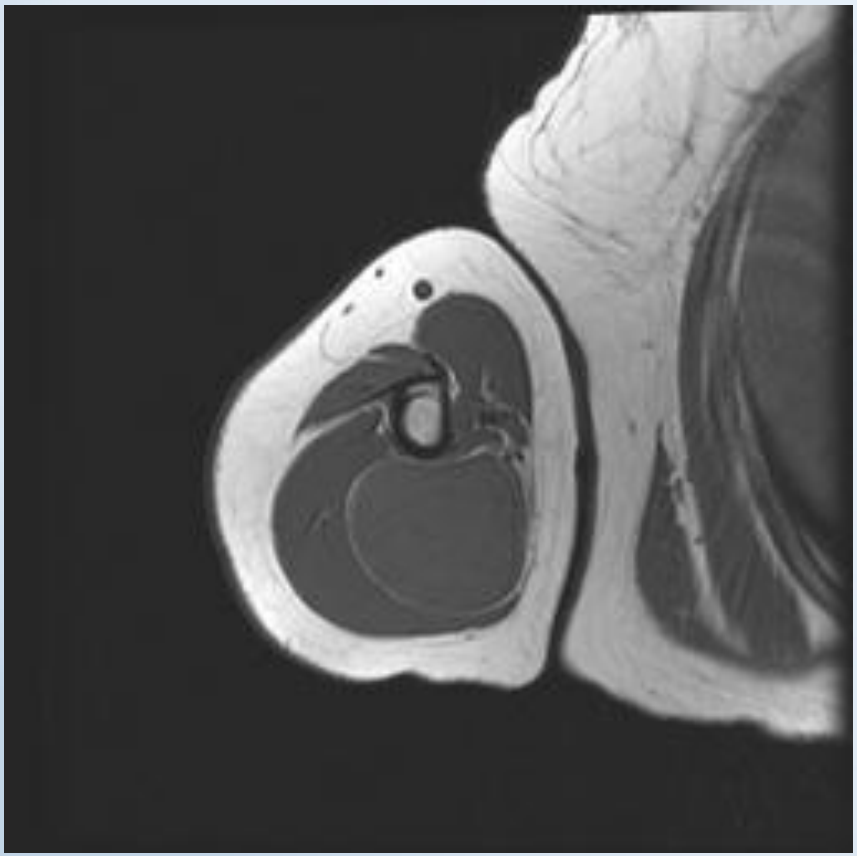


Management of Soft Tissue Sarcoma



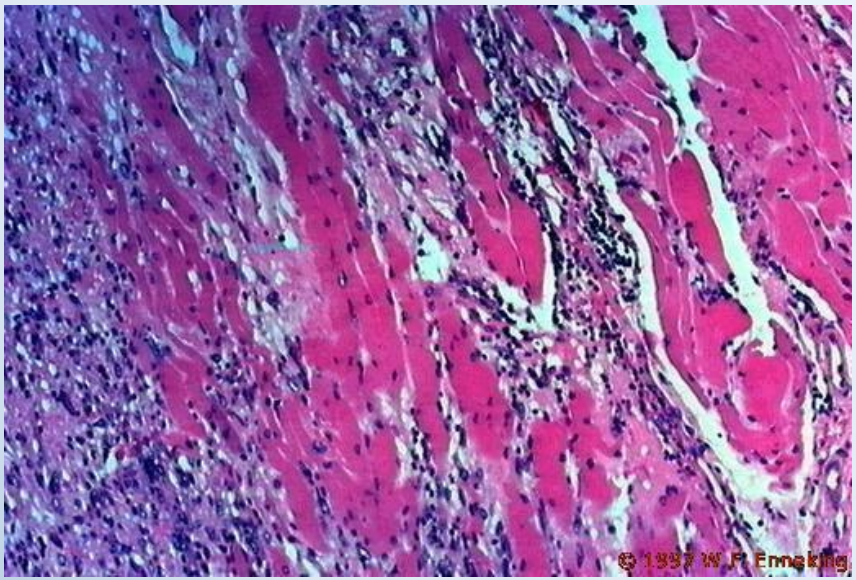
- **Wide** surgical resection
- If we look at imaging and feel that we can resect tumor
  - with adequate wide margins (2 cm)
  - without sacrificing critical structures or
  - significantly affecting function
- surgery alone is usually all that is necessary -usually only reserved for small, superficial tumors, irrespective of tumor grade

Management of Soft Tissue Sarcoma



- If wide resection means
  - sacrifice of critical structures or
  - severe functional consequences
- Radiation will be used – almost always in deep lesions
- Therefore radiation is necessary if **marginal** margins are anticipated

Radiation for Soft Tissue Sarcoma



- Rationale – allows for a less extensive operation, preserving critical structures
- Treats microscopic disease that is often found in surrounding edema
- Tends NOT to shrink tumour (exception – **myxoid liposarcoma**)

Radiation for Soft Tissue Sarcomas

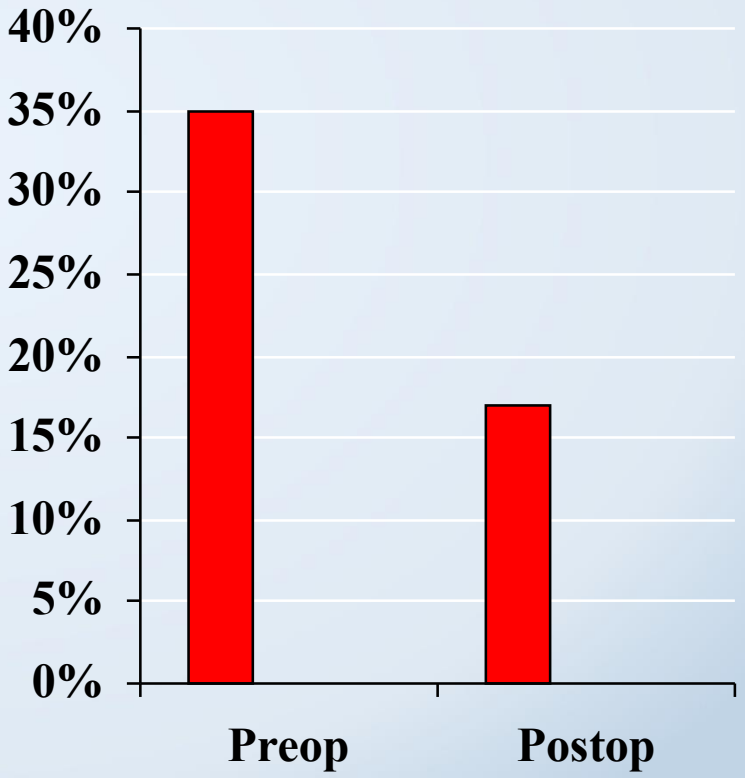
- Like surgery in that it achieves local control of the tumour only
- It does not affect the development of metastases
- Local control with marginal excision + radiation is equivalent to wide excision, but function is better
- Can be administered preoperatively or postoperatively – no recurrence advantage
- We prefer preoperative irradiation

NCIC SR-2 Randomized Clinical Trial- O'Sullivan et al

- STS patients seen by surgeon and rad onc with decision for combined Rx
- Randomized to receive preop or postop
- End points- acute wound complications, function
- Complications defined as repeat surgery or deep wound packing beyond 6 weeks

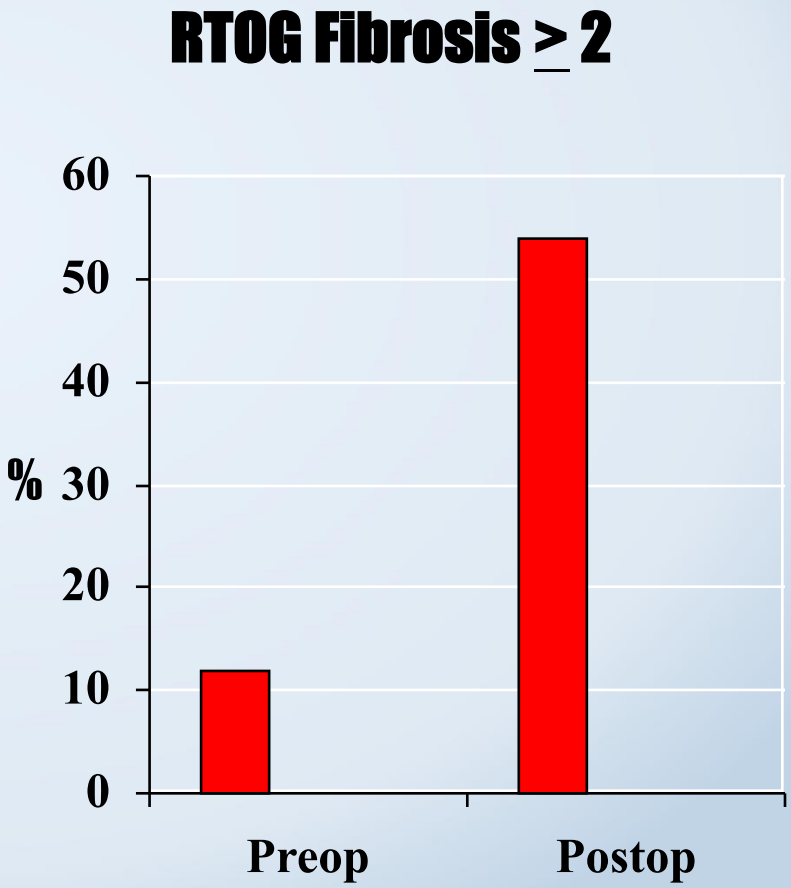
SR-2 RCT- Results

- Wound healing complications twice as frequent following preop rads
- Other significant variables- tumour size, upper vs. lower extremity



Radiation for soft tissue sarcomas

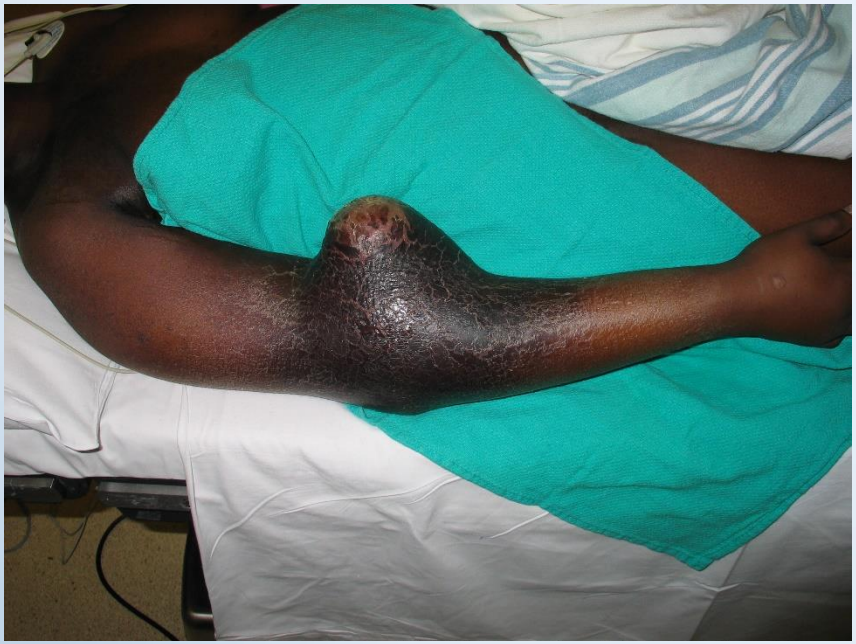
- Late effects of fibrosis measured at 2 years
- Fibrosis correlates with reduced function scores
- This improves long term functional outcome
- Wounds almost always heal

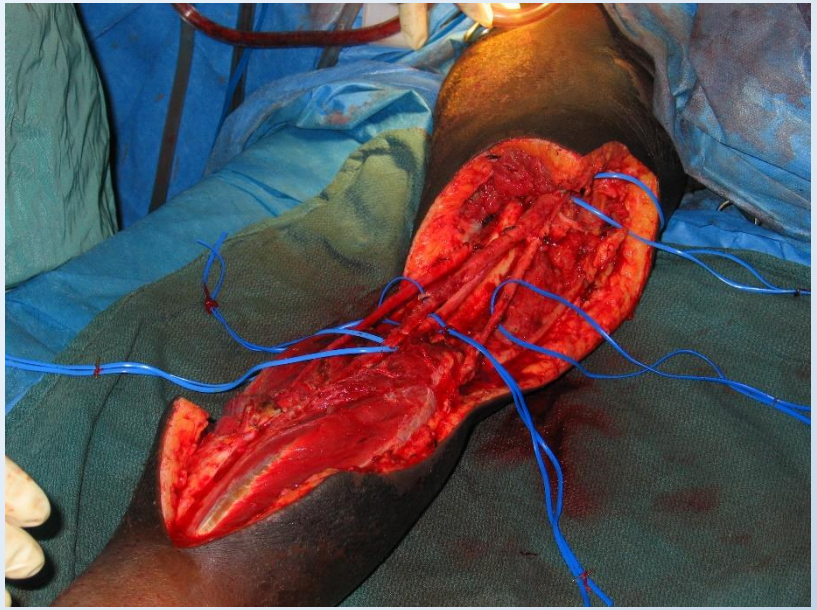


Chemotherapy in Soft Tissue Sarcoma

- Rarely used with resectable localized disease
- Exceptions – **extraskeletal Ewing sarcoma, embryonal/alveolar rhabdomyosarcoma**
- May be used in metastatic disease or advanced/unresectable localized disease
- Targeted therapy
- immunotherapy

Case 1





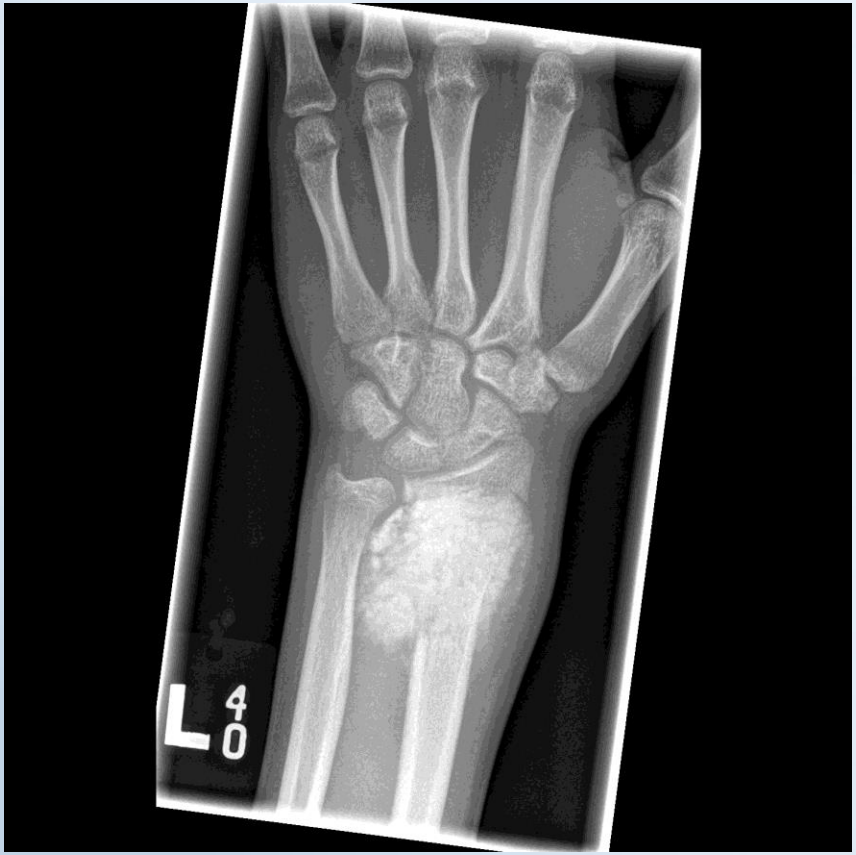
Management of Osteosarcoma

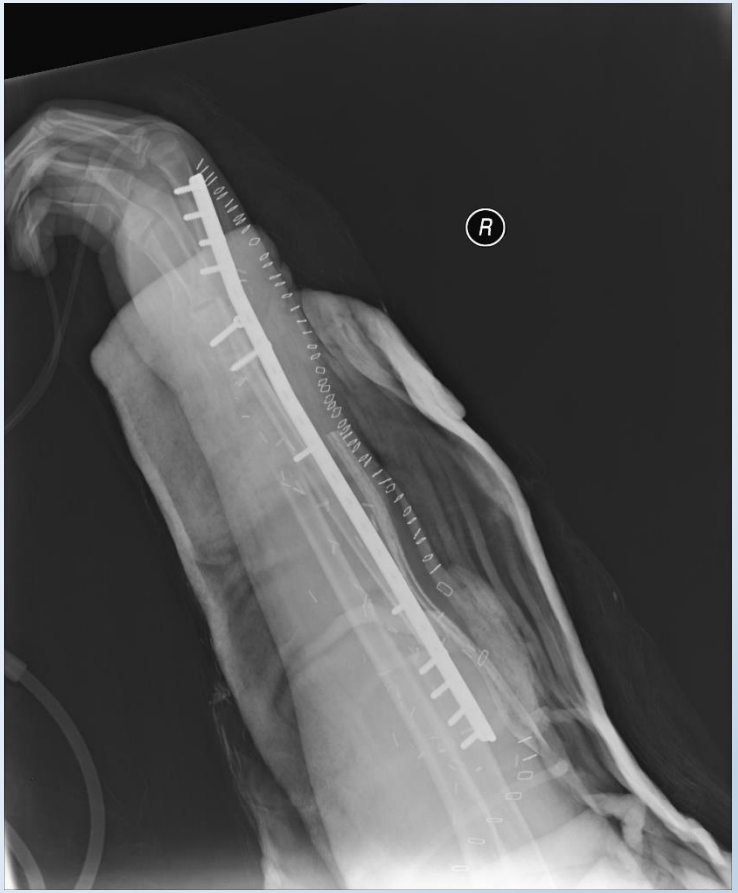
- Commonest bone sarcoma
- Historically extremity amputation was treatment of choice
- 95% of patients had amputation
- 90% of patients died from metastatic disease

Current Osteosarcoma Treatment Paradigm

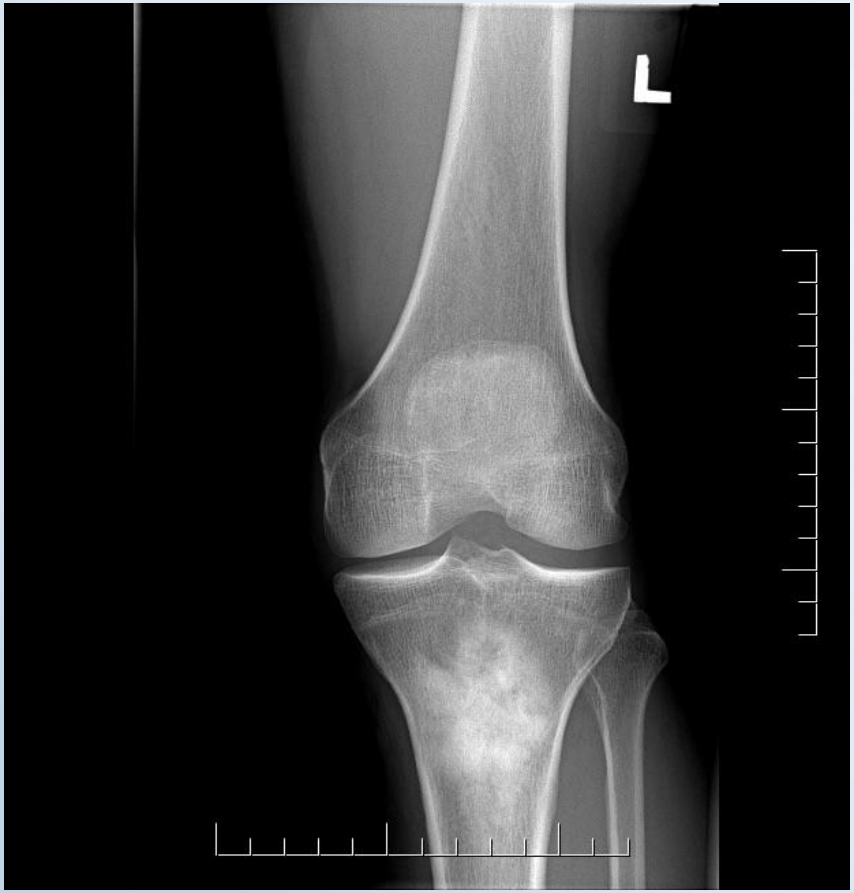
- multiple drug neo-adjuvant chemotherapy
  - Adriamycin
  - Cisplatin
  - high dose methotrexate
- Wide resection
- Completion of adjuvant chemotherapy
- aggressive metastasectomy
- Current cure rate approx. 70%

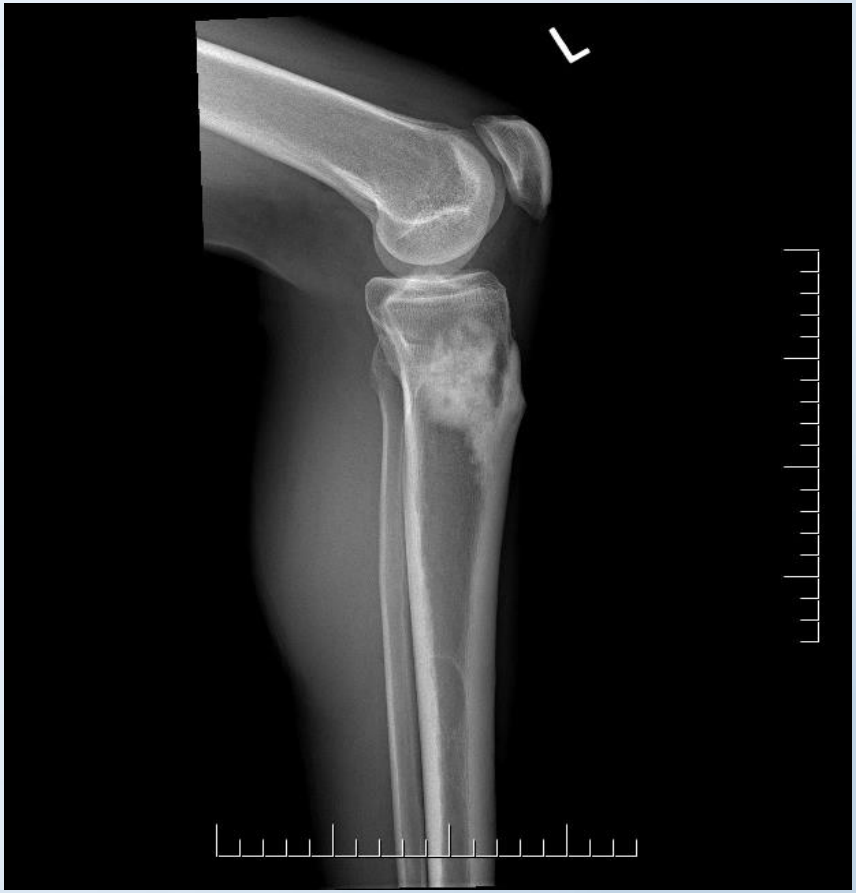
Case 2



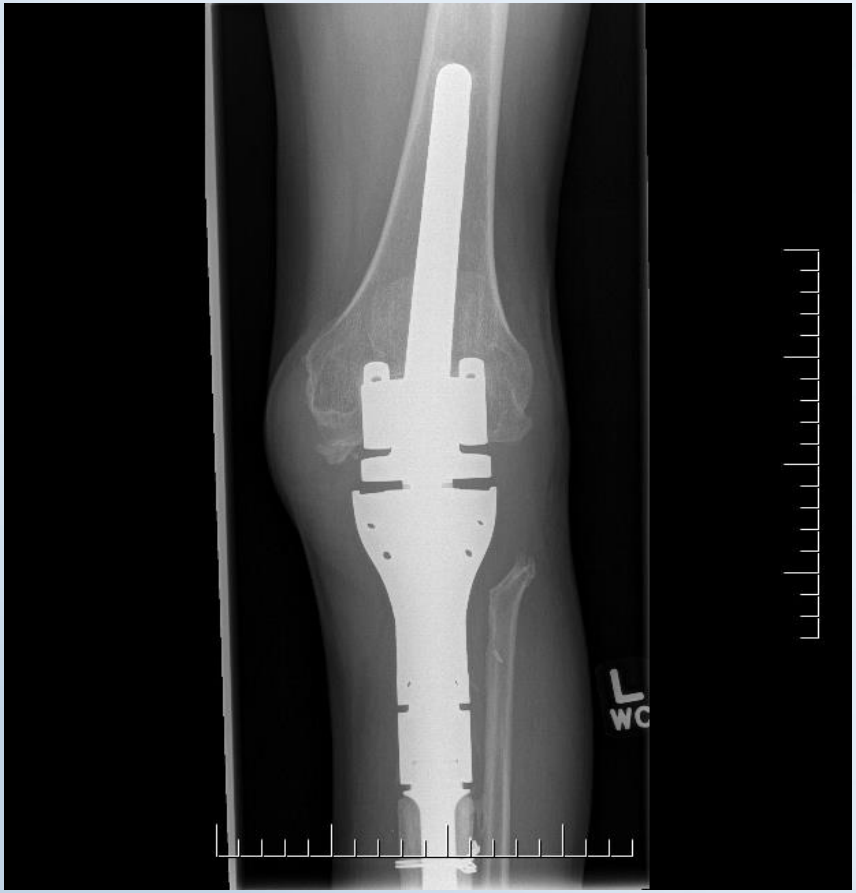


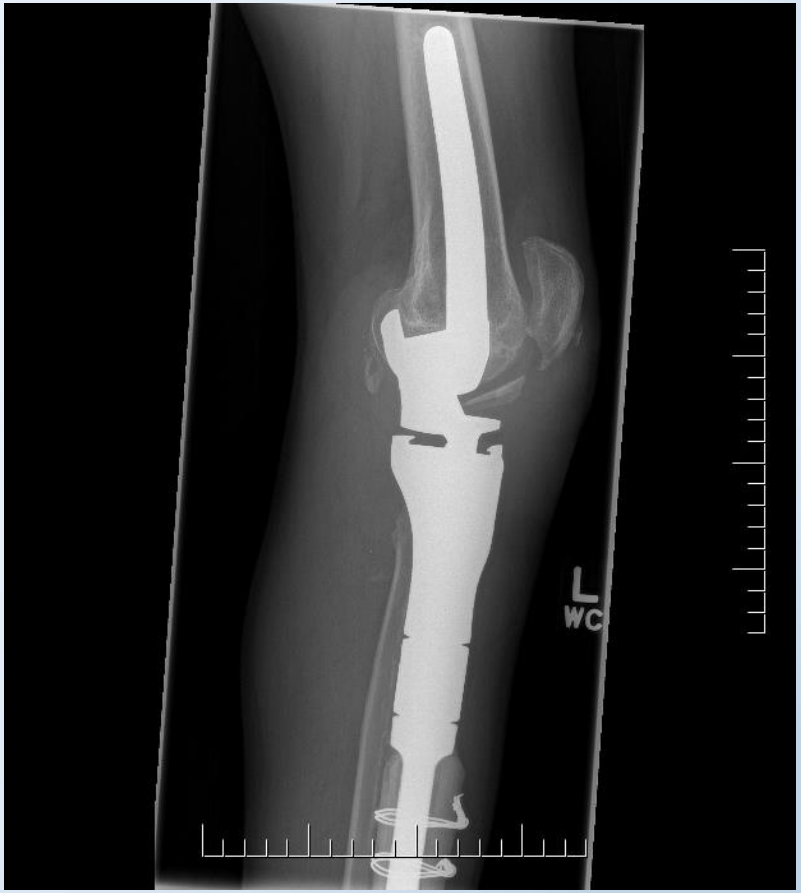
Most bone sarcomas occur around the knee





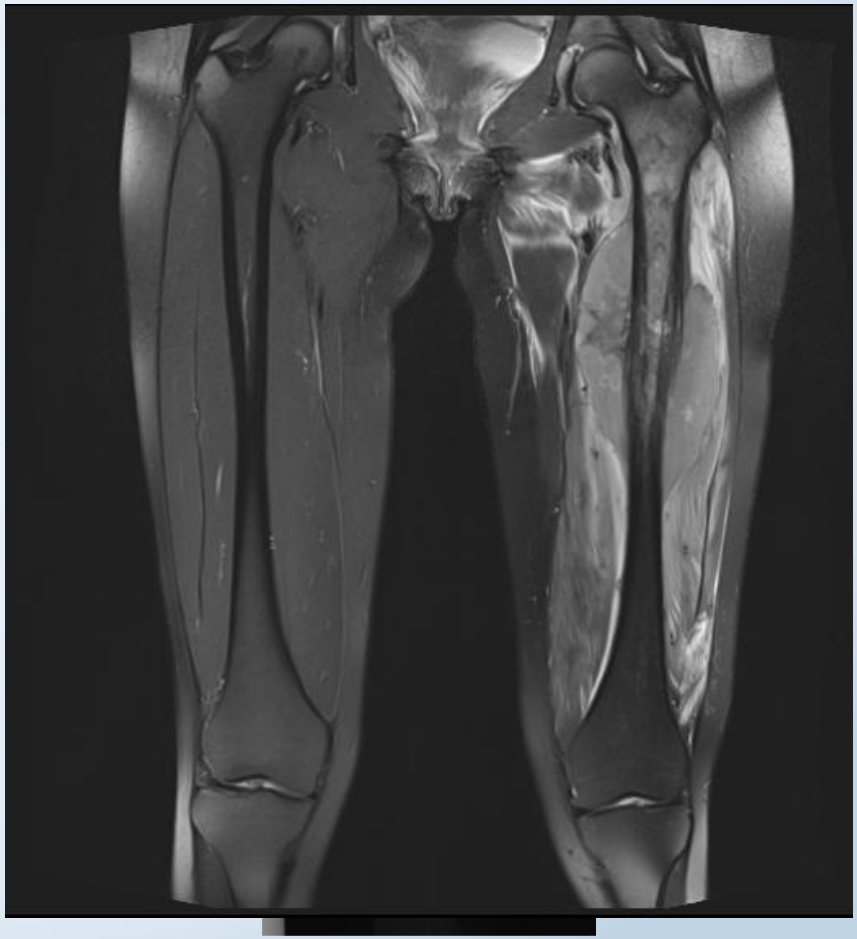
Tumour endoprosthesis





Management of Ewing sarcoma

- Second most common bone sarcoma in children
- Historically radiation was treatment of choice
- Current treatment involves neoadjuvant chemotherapy and limb salvage surgery when possible
- Radiation reserved for tumours that are unresectable or if limb salvage will have severe functional consequences



Chemotherapy and Ewing's Sarcoma

- Current regimens use:
- VAC (Vincristine, Adriamycin and Cyclophosphamide)
- Addition of Etoposide and Ifosfamide has shown to be of benefit in non-metastatic Ewing's

Grier HE et al, Addition of Ifosfamide and Etoposide to Standard Chemotherapy for Ewing's Sarcoma and Primitive Neuroectodermal Tumor of Bone, NEJM 348(8), 694-701, 2003.

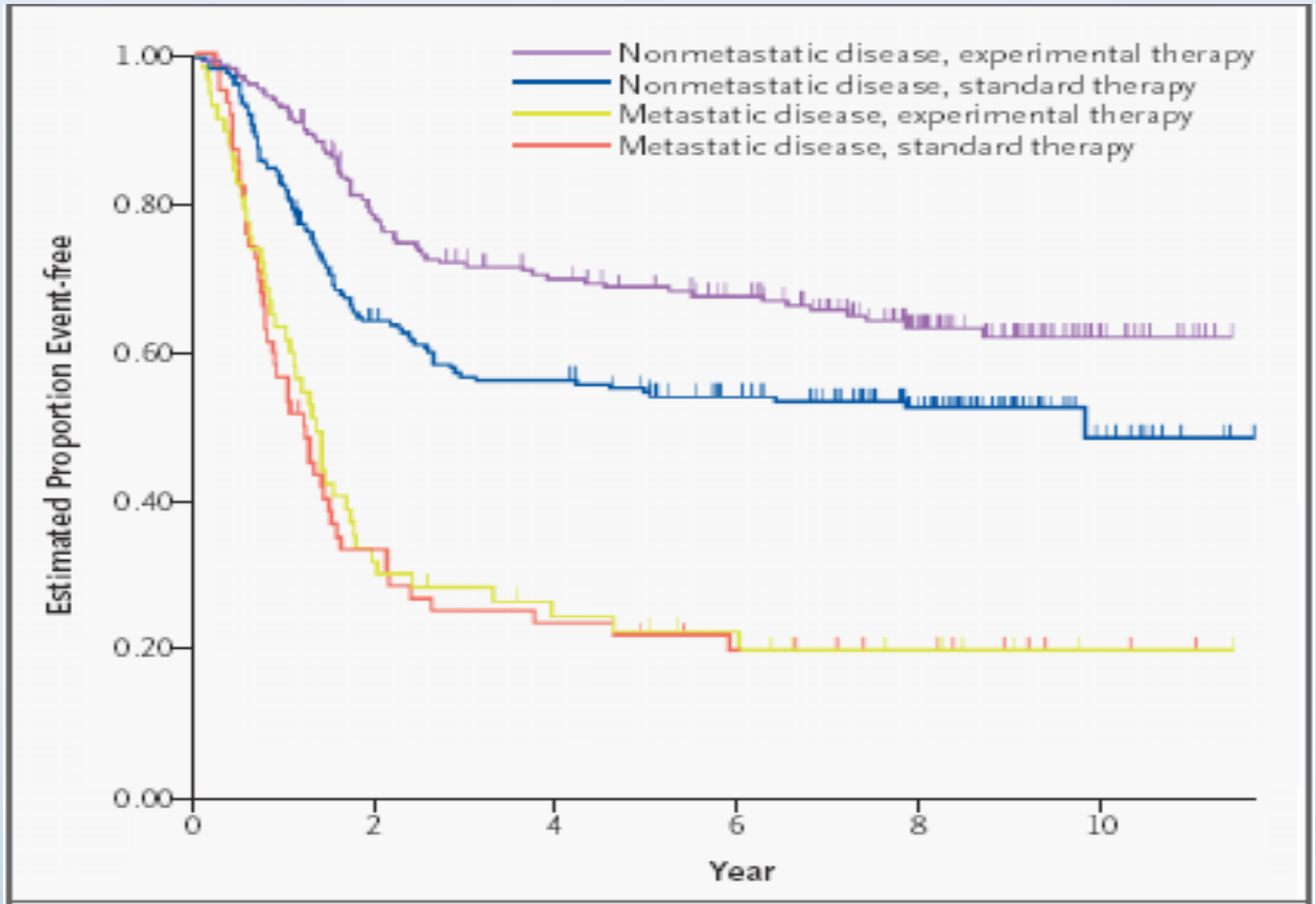
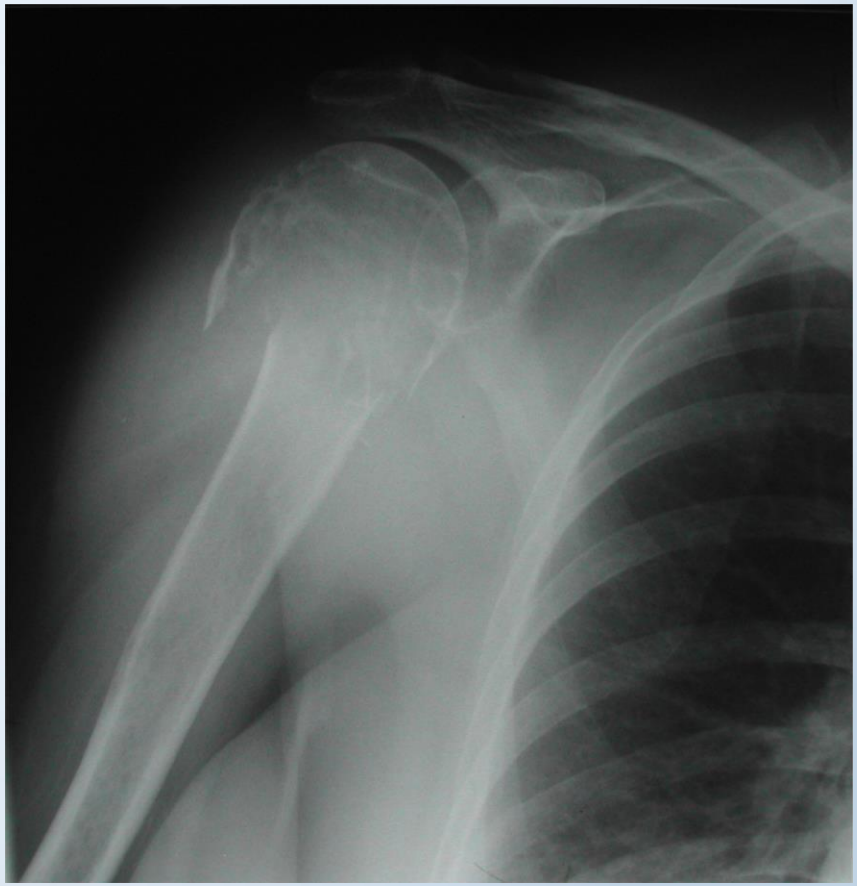


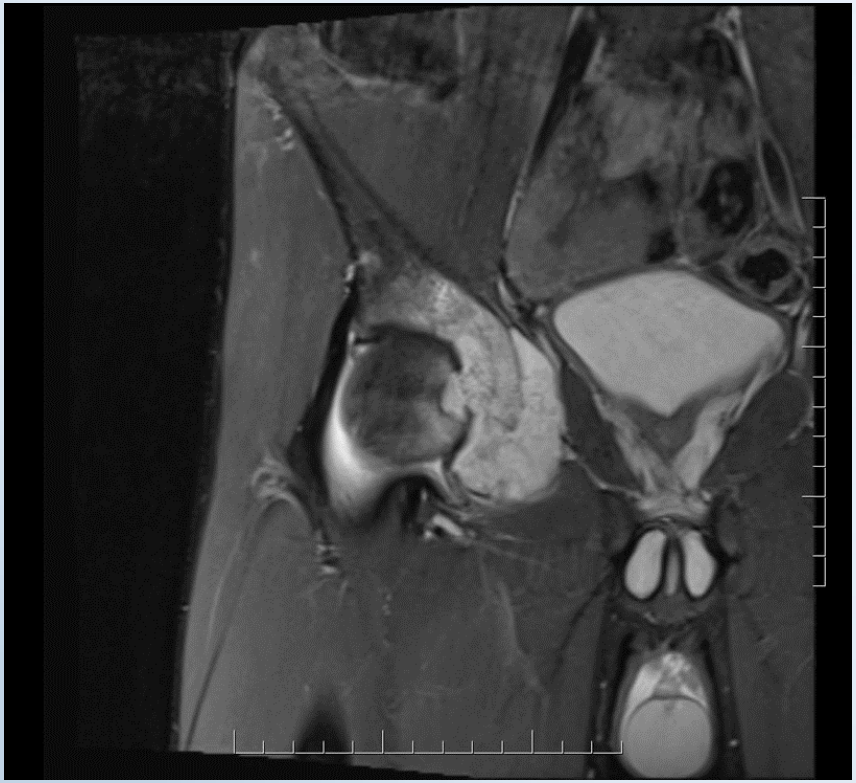
Figure 1. Event-free Survival According to Study Group and the Presence or Absence of Metastatic Disease.

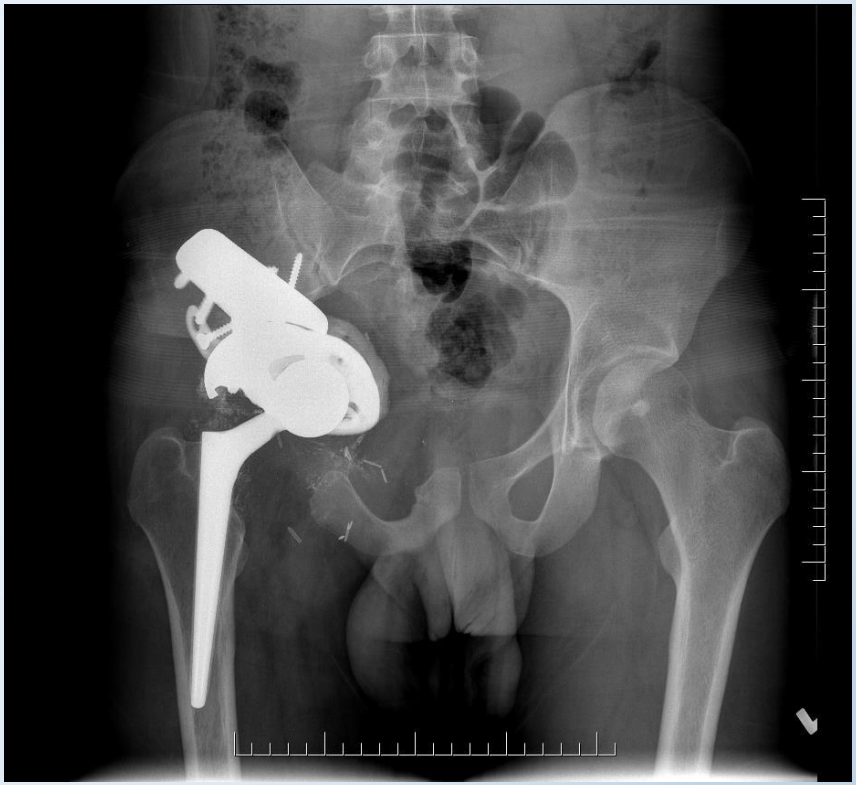
Management of Chondrosarcoma

- Most common bone sarcoma in elderly
- Surgical disease
- No role for adjuvants
- Grade 1 intramedullary – curettage
- Grade 1 extramedullary – wide resection
- Grade 2/3 – wide resection & reconstruction



Commonest sarcoma in the pelvis





Questions?

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