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Skip metastasis in bone sarcoma. Epidemiology pronostic value and surgical incidences

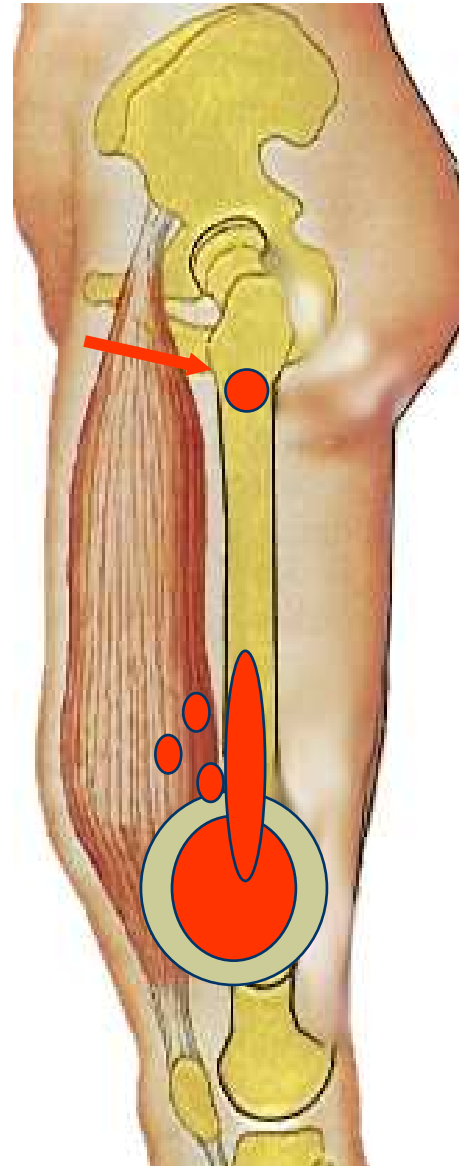
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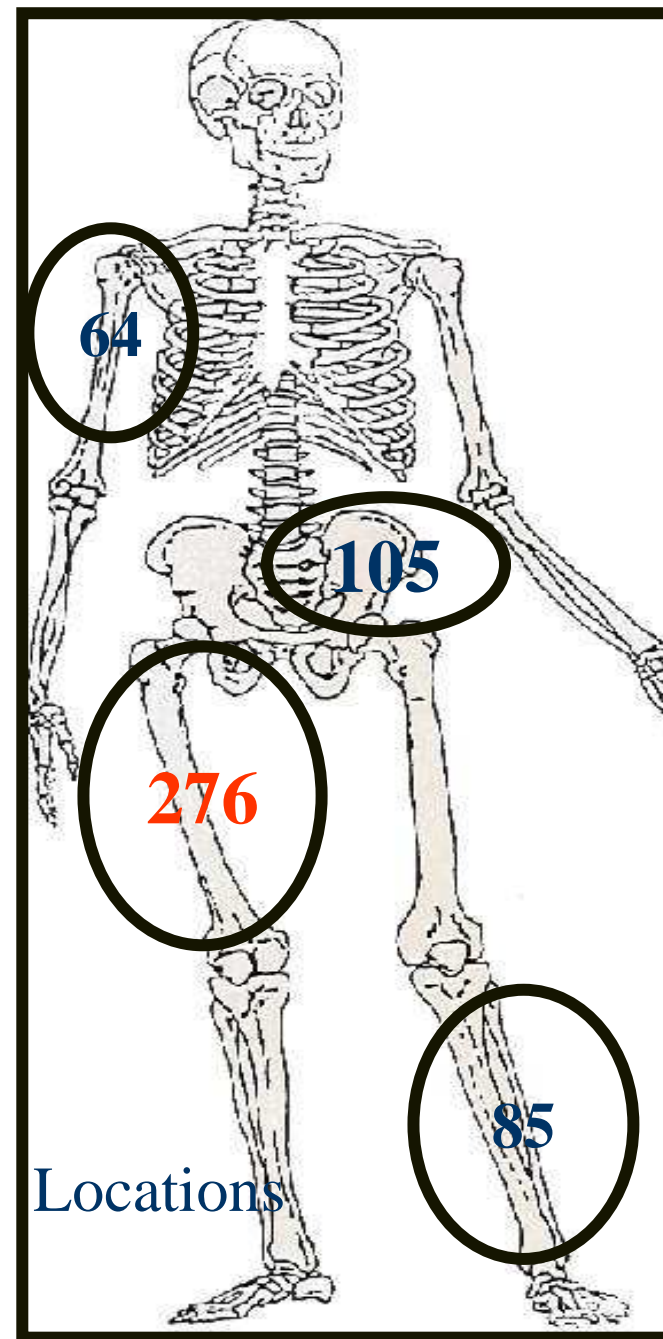
Introduction

30 years ago Enneking described **Skip metastases** by but till now few papers have tried to evaluate their actual incidence prognostic value and surgical implications that is the aim of this Monocentric retrospective study



Material

- ◆ 520 patients with bone sarcoma of limbs, scapula or innominate bone
- ◆ 255 OS , 135 CS, 130 EW and other
- ◆ Have been treated and/or followed up by the same team in 23 years.
- ◆ 503 of these were treated by limb salvage



Method

- ◆ Preoperative screening of patients included standard X rays, CT and bone technetium scan in all cases and MRI in 350 cases
- ◆ Diagnosis of skip was made on preoperative screening and confirmed by postoperative histologic examination
- ◆ This research was supplemented by careful examination of imaging of patients who suffered of regional relapse after surgery
- ◆ Median follow up is 16 years (minimal 4) except for 4 disease free survivors lost for follow after 3 years

Results

- ◆ Frequency : 21 skip metastases (4%) have been observed
- ◆ 12 out of 255 patients with Ostéosarcoma (5%)
- ◆ 8 Out 120 patients with Ewing's sarcoma (6%)
- ◆ Only one in 135 chondrosarcoma
- ◆ Most of the skip lesion were unique but 3 patients had 2 and one 3 skip

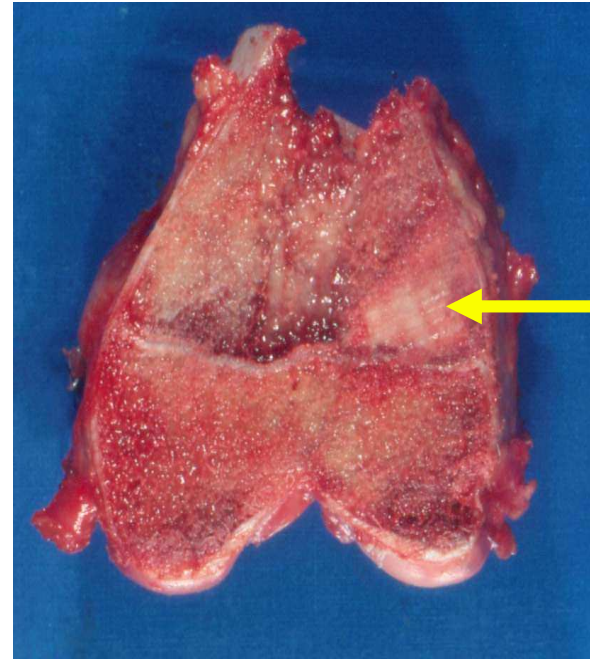
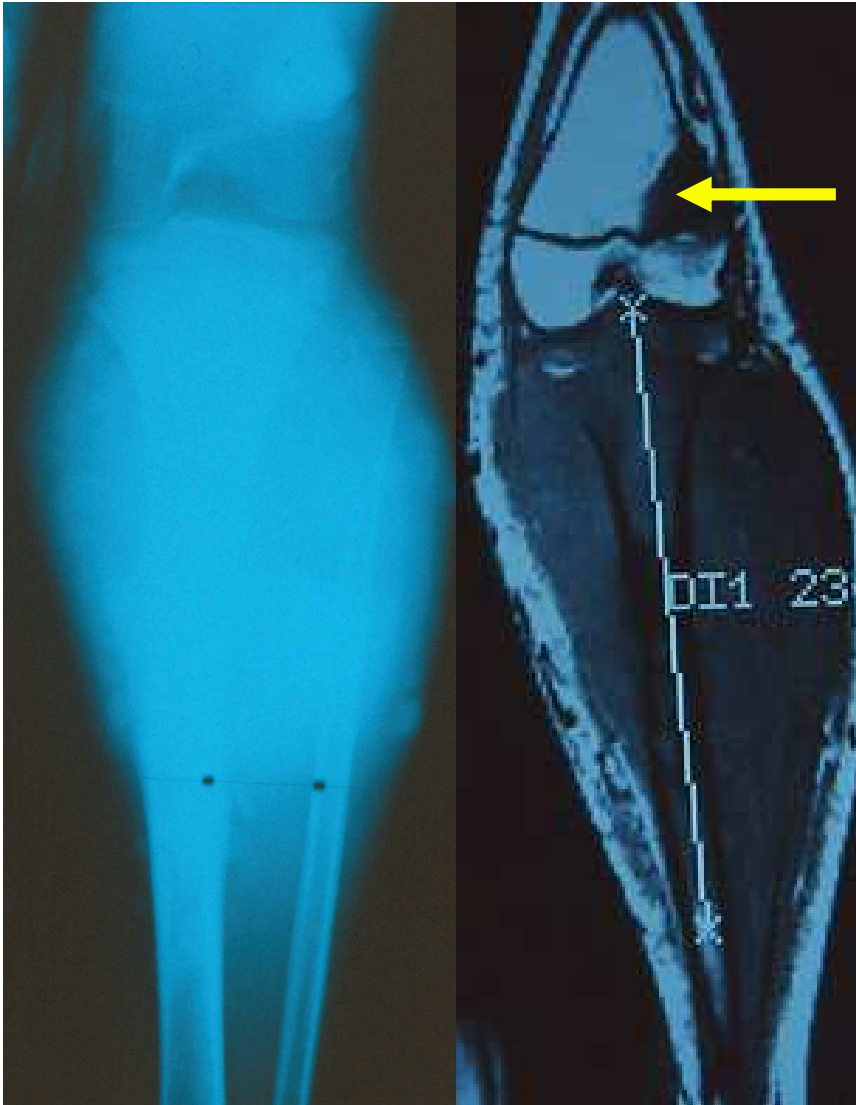
Proximal skip in osteosarcoma



Diaphyseal skip

distal femur osteosarcoma

Trans articular skip



Osteosarcoma of tibia

The femoral skip metastasis compelled to resect both tibial and femoral sides of the knee

Osteosarcoma of distal femur with 2 distal skip



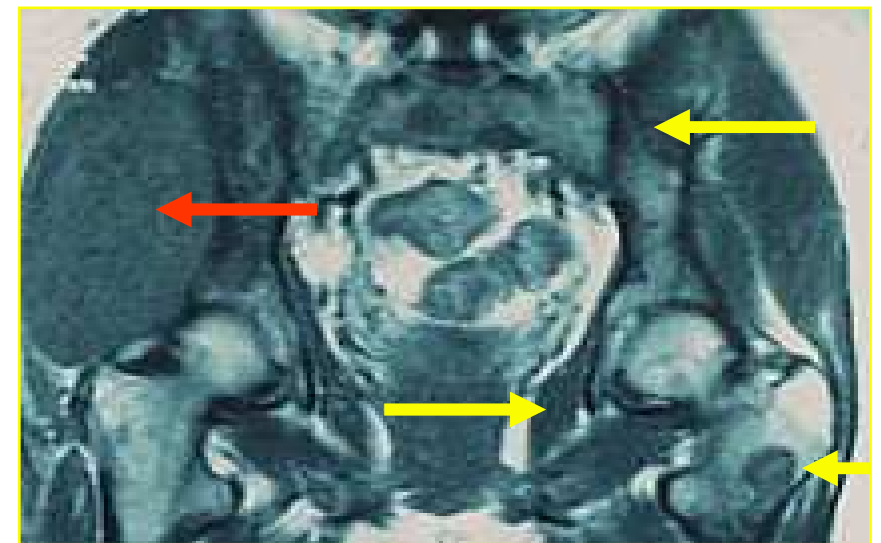
Proximal tibia



Distal tibial skip

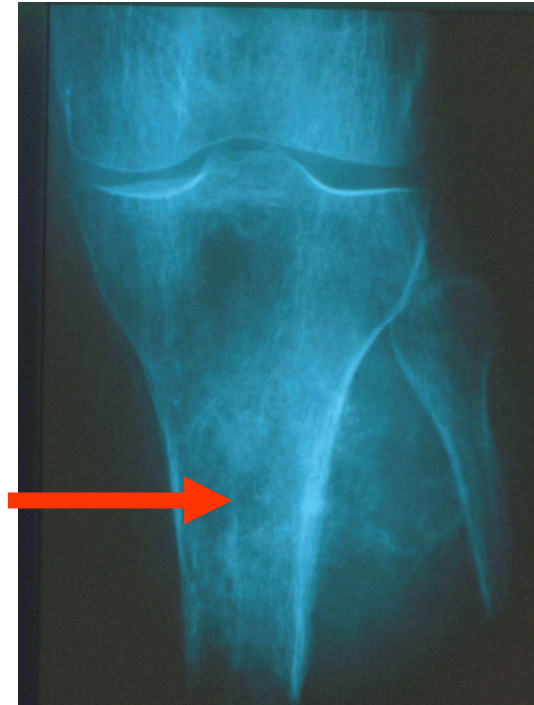
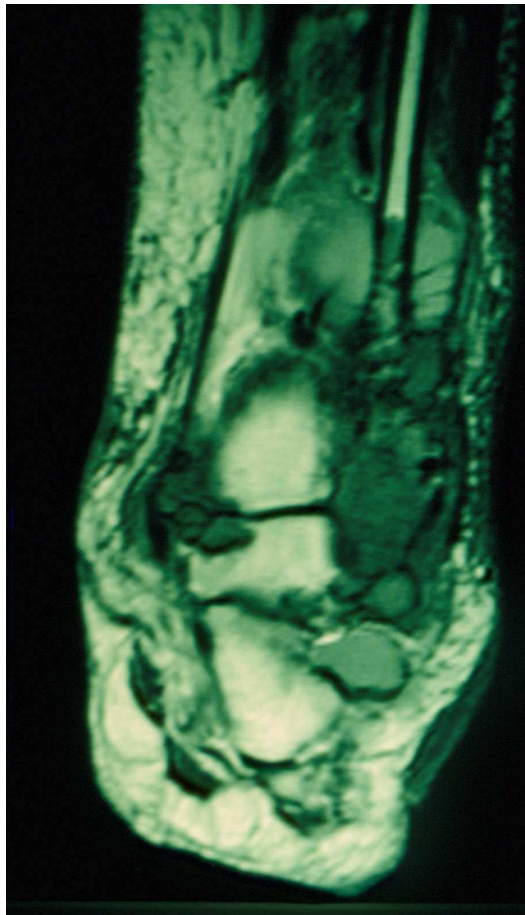
Skip in Ewing's sarcoma

- ◆ The 6 other have been discovered on preoperative MRI of Ewing's sarcoma of innominate bone
- ◆ In half of these patients the skip lesions could not be seen on X Rays, CT and Technetium Scan



Skip metastasis unrecognized before amputation

Osteosarcoma of distal fibula
treated by leg amputation

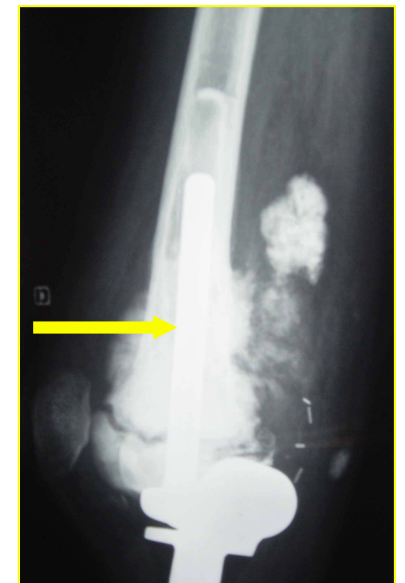
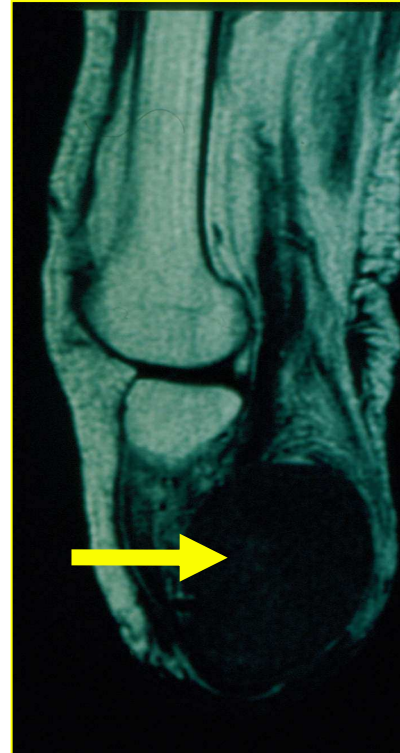


The NMR of distal tibia ignored
the proximal skip lesion

Local recurrence appeared after
7 years

Unrecognized skip before resection

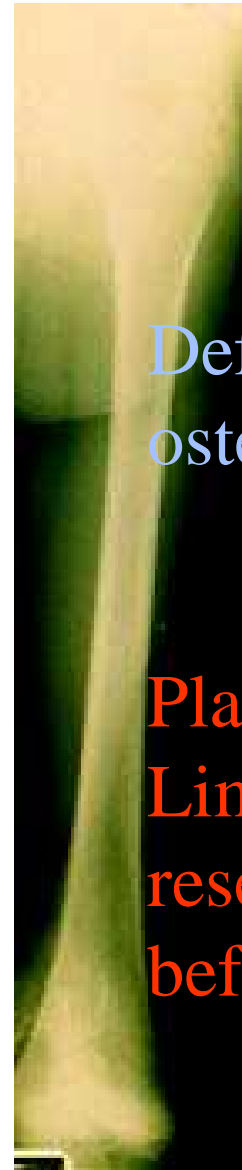
- ◆ 4 patients did not benefit of an efficient preoperative screening (no total bone MRI)
- ◆ the diagnosis of skip metastase was done only after local recurrence (one after transtibial amputation)



Consequence of skip from distal femur

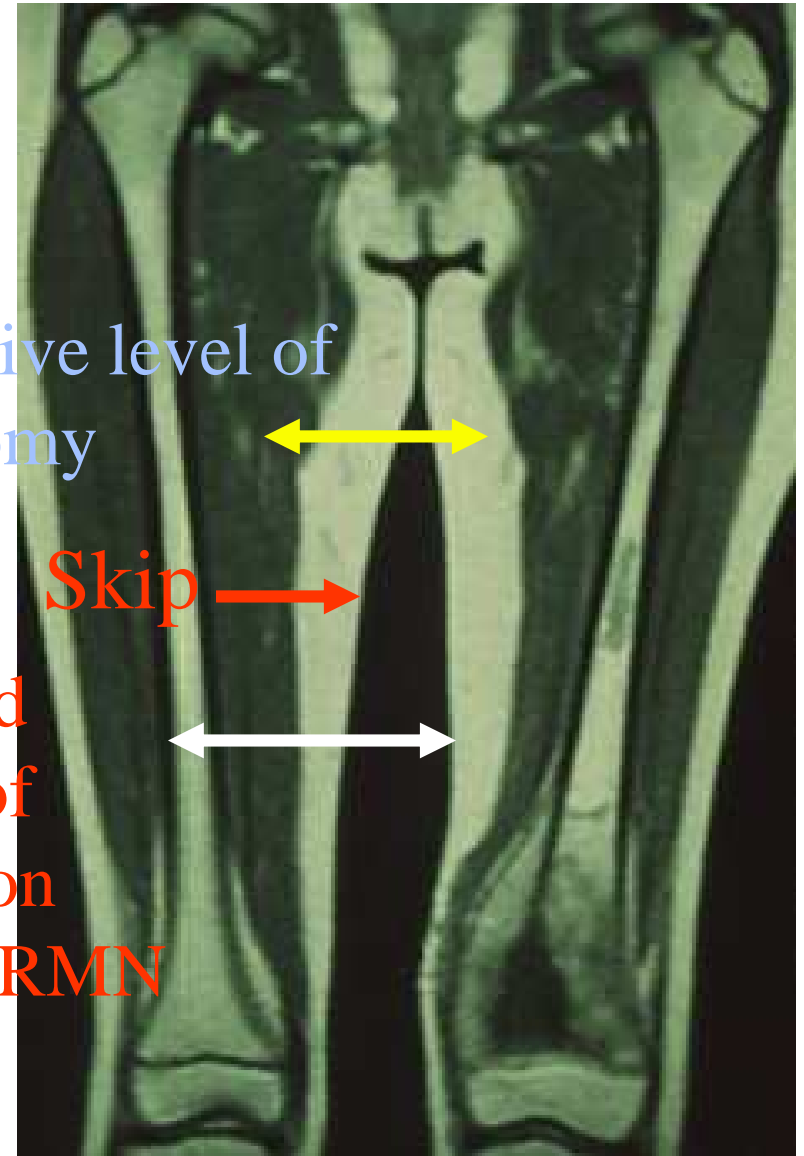


OS girl of 11



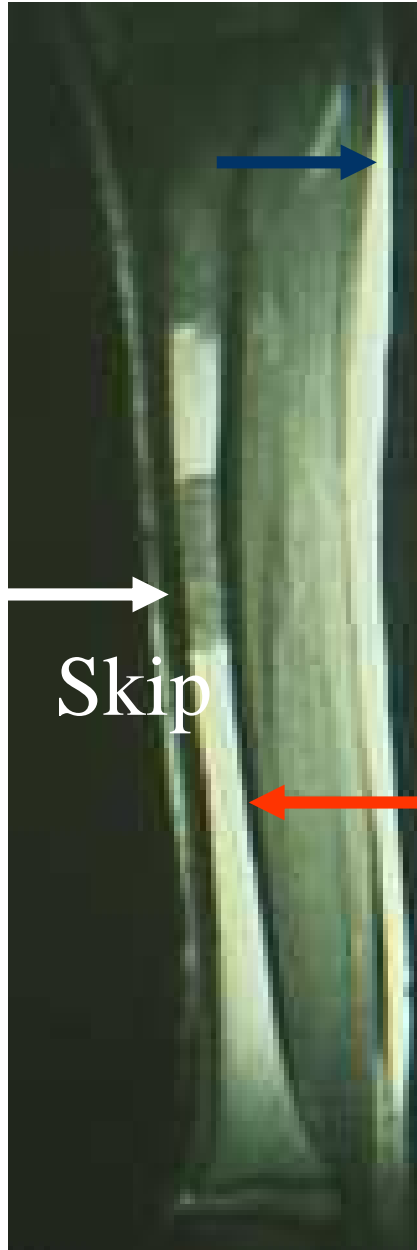
Definitive level of osteotomy

Planned Limit of resection before RMN

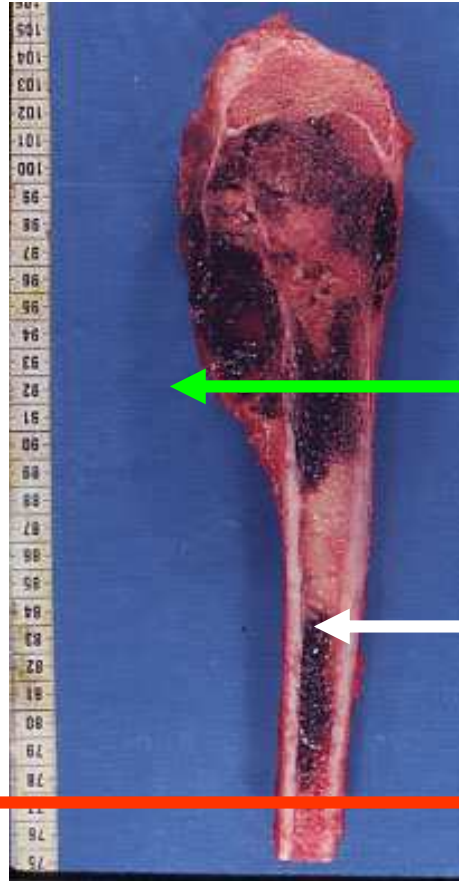


Skip

Consequence of skip lesion from tibia(OS)



Skip



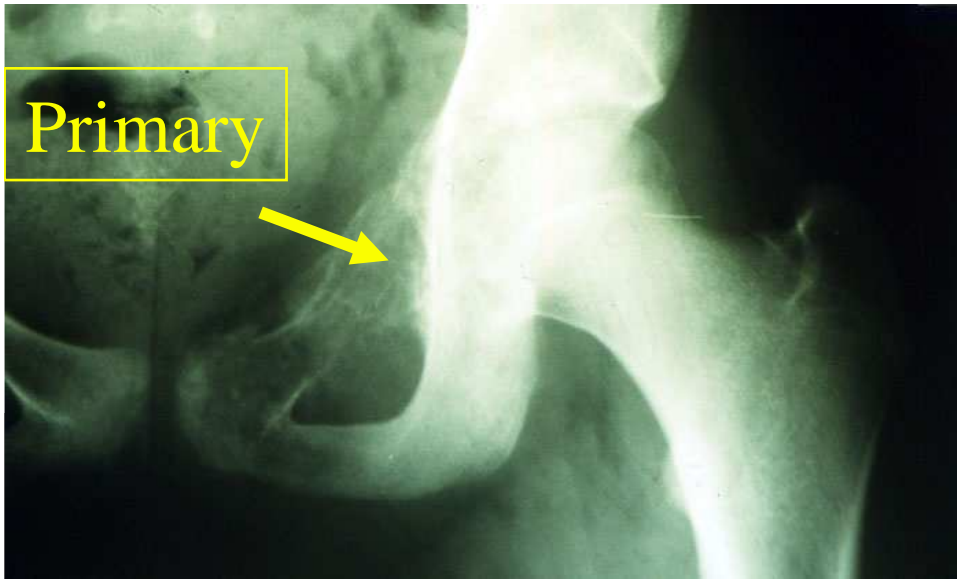
primary
tumor

Planned limit of
resection before
RMN

SKIP

Definitive level of resection
due to the skip metastasis

Femoral skip metastasis of pubic Ewing



In this 13 years old girl preoperative RMI pointed out a femoral skip that was not apparent neither on CT nor on bone scan

Consequences and outcome

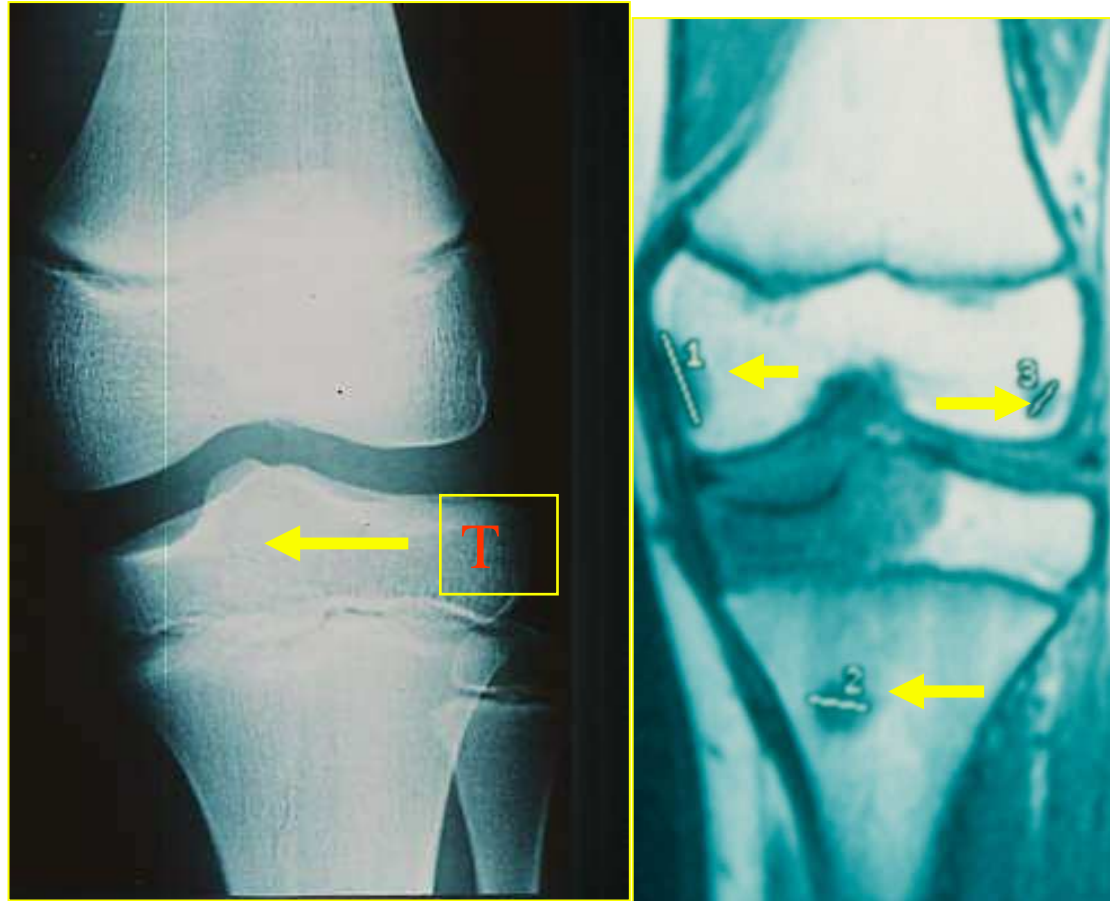
The wide resection of both lesions and a six drugs chemotherapy permits to obtain a long term disease free survival

Radiological aspect of skeletal reconstruction
CDFS for 10 years

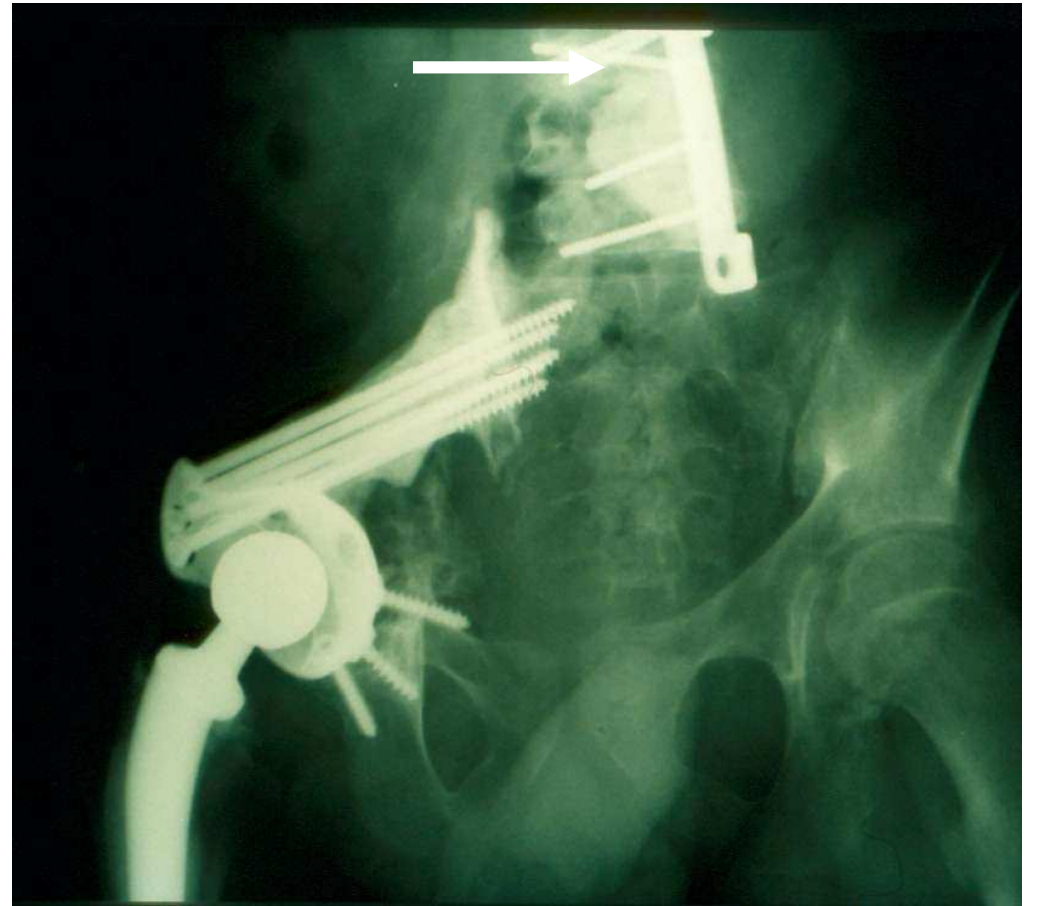
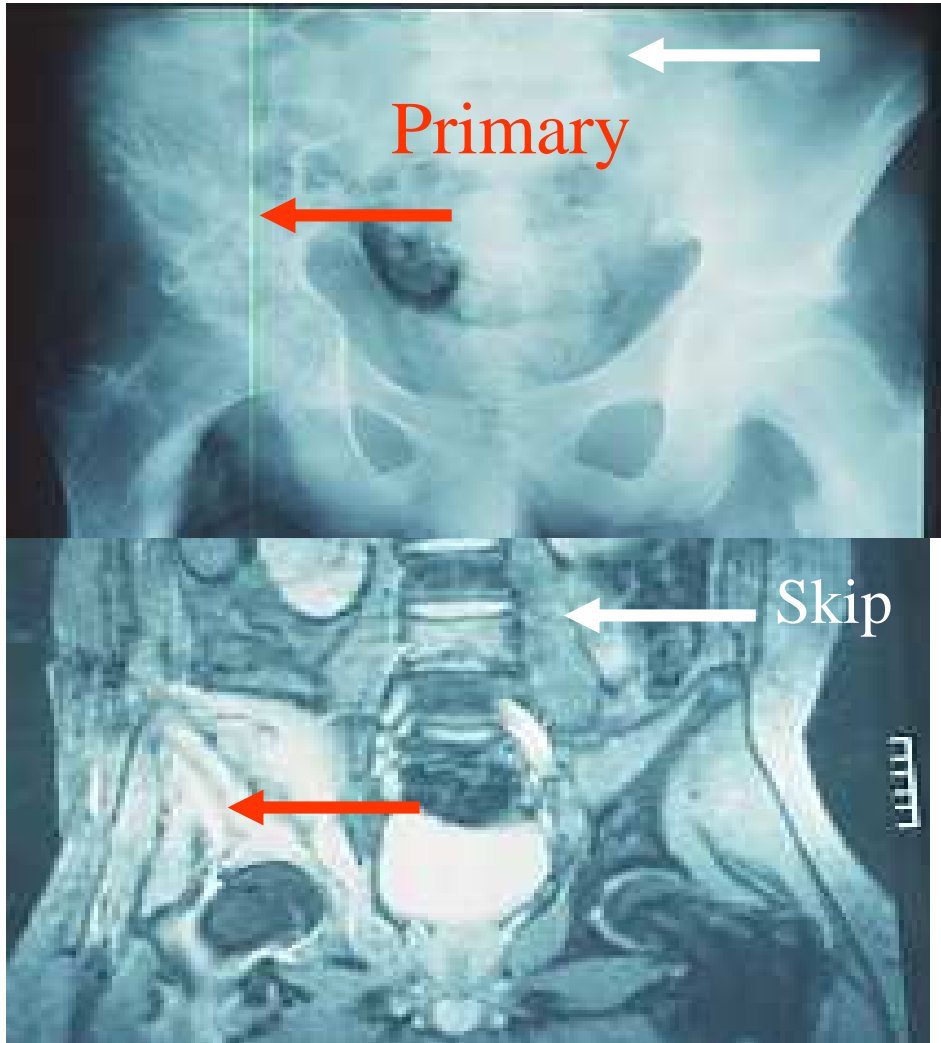


3 Skip from Ewing's sarcoma of tibia

- ◆ Out 130 patients with Ewing's sarcoma 8 (6%) presented with skip lesions
- ◆ 6 in pelvic primary
- ◆ Two for a long bone primary
- ◆ One patient had three skips on the same knee



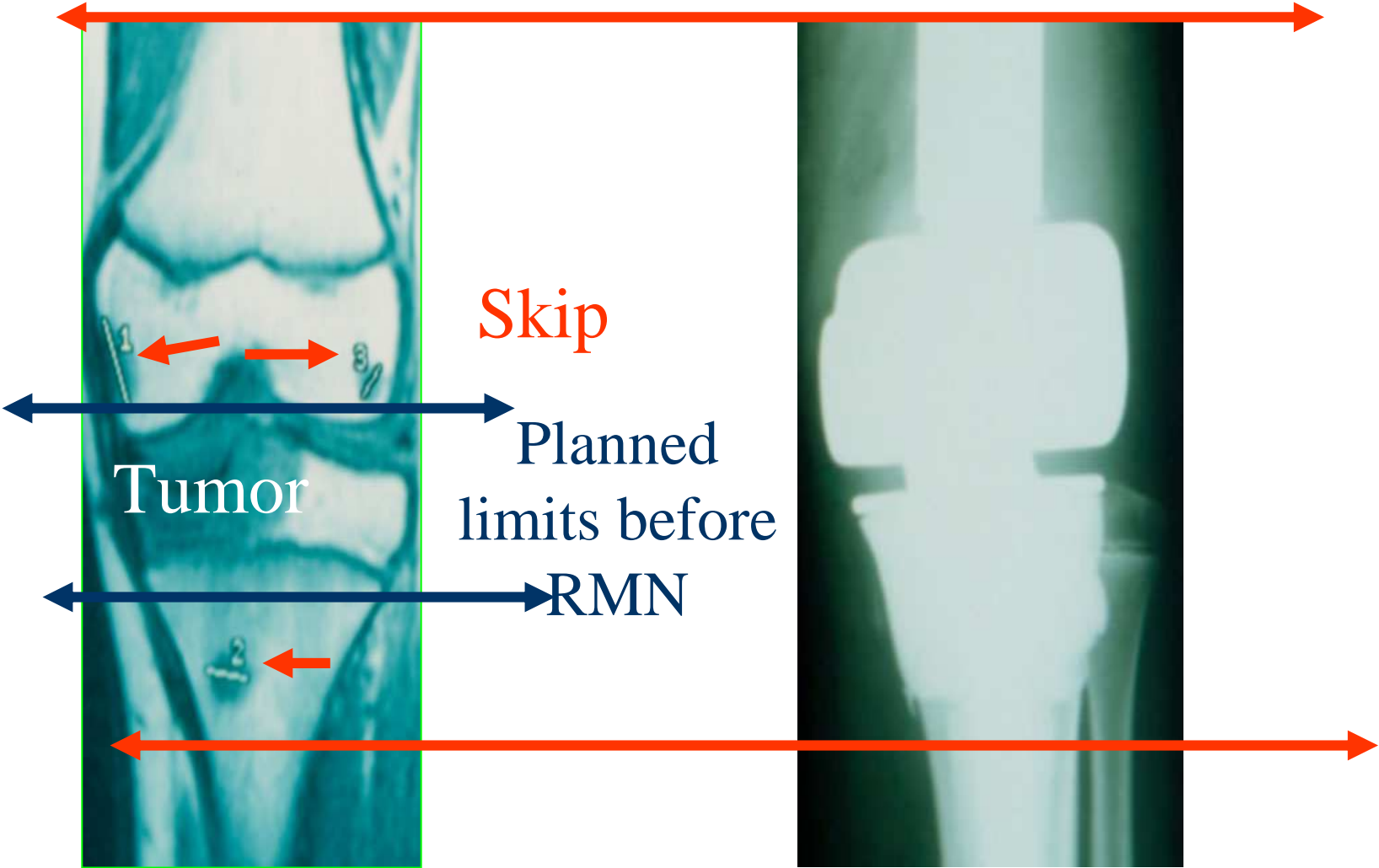
Consequence and outcome of solitary lumbar skip metastasis from iliac Ew



In this patient the MRI showed a solitary met of L4 that was resected. A long term remission was observed

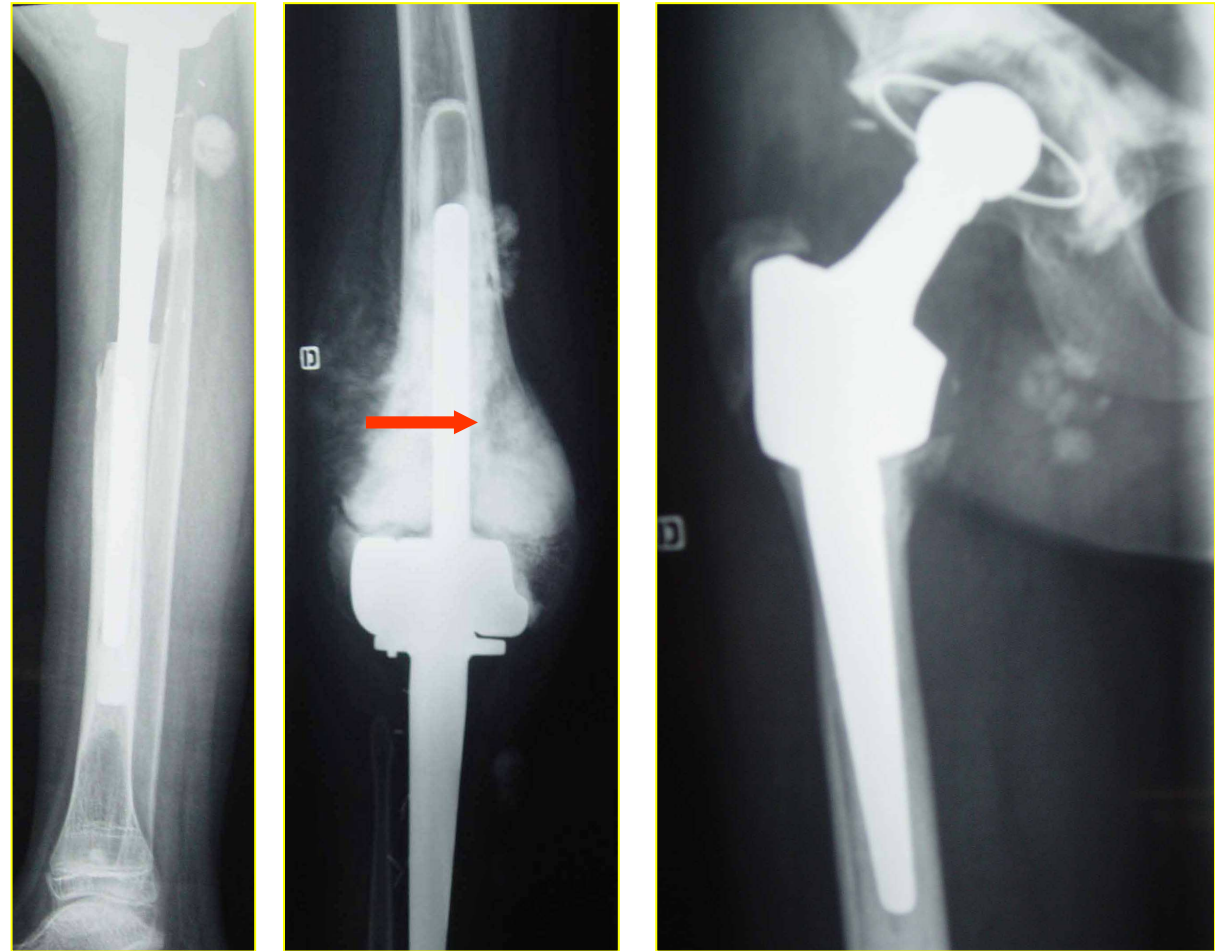
Consequences of 3 skip lesions from tibia

Definitive level of resection due to the skip metastases



Unrecognised skip metastasis from tibial OS

In this patients the prognostic value of skip lesion was directly correlated with the adequacy of resection and the efficacy of the chemotherapy when chemotherapy is suboptimal or some skip not resected the prognosis is dismal



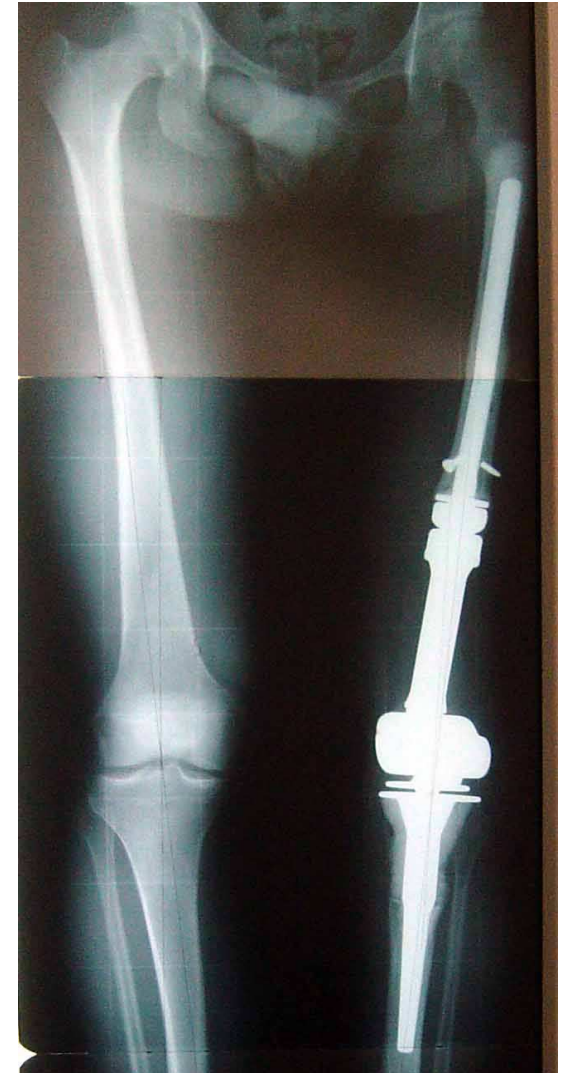
In this patient no preoperative RMI was performed and the femur skip was ignored resulting in a recurrence around the stem of the prosthesis

Prognostic value of skip

With our most effective protocols and when all visible lesion could be resected, the presence of skip lesions did not affect the disease free survival of our patients



Ewing with 3 skip



10 years FU CDFS excellent fonction

Conclusion

Skip metastases are rare in Osteosarcoma and Ewing's sarcoma (5%) and very rare in chondrosarcoma (1%).

Pelvic Ewing's presents a very high risk of regional skip (20%)

With effective preoperative screening and optimal chemotherapies the skip lesions are no longer adverse prognostic factor