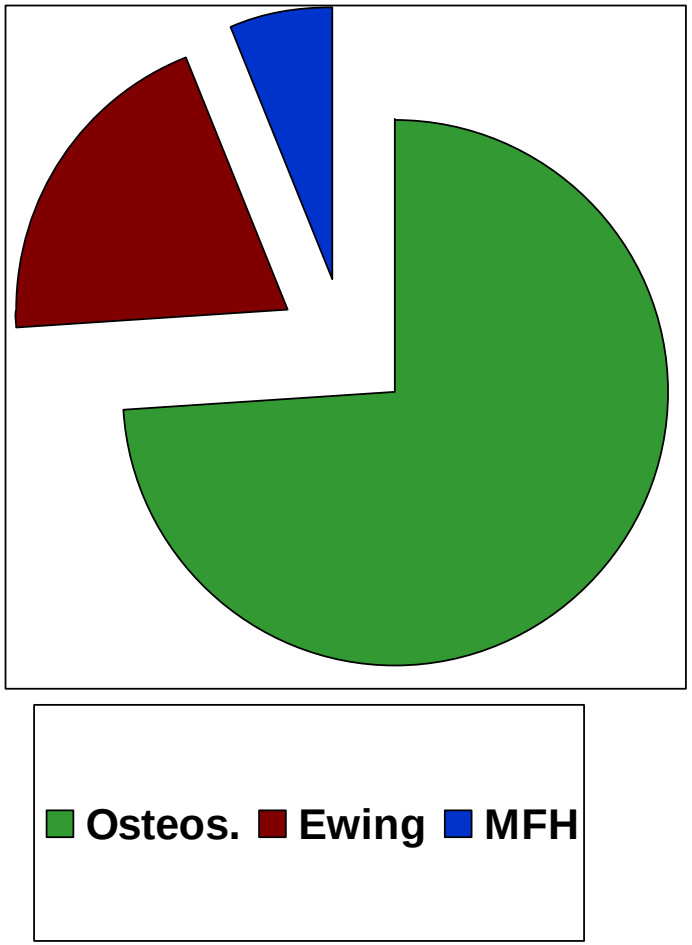
Long term results of expanding prostheses for limb salvage surgery in children with bone tumors

Communication présentée à l'EFORT 2008 Nice

www.nicoledelepine.fr

Histology and Locations of tumors

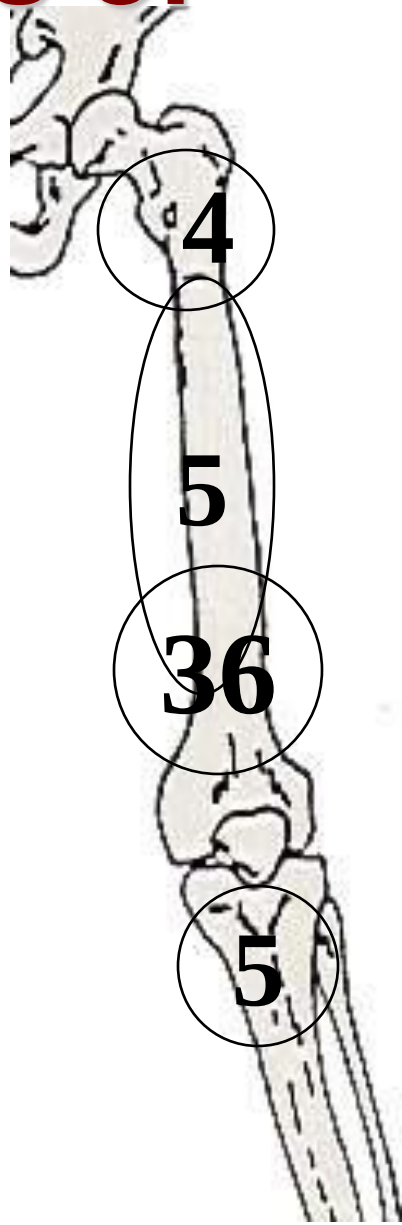


proximal femur 4

total femur 5

distal femur 36

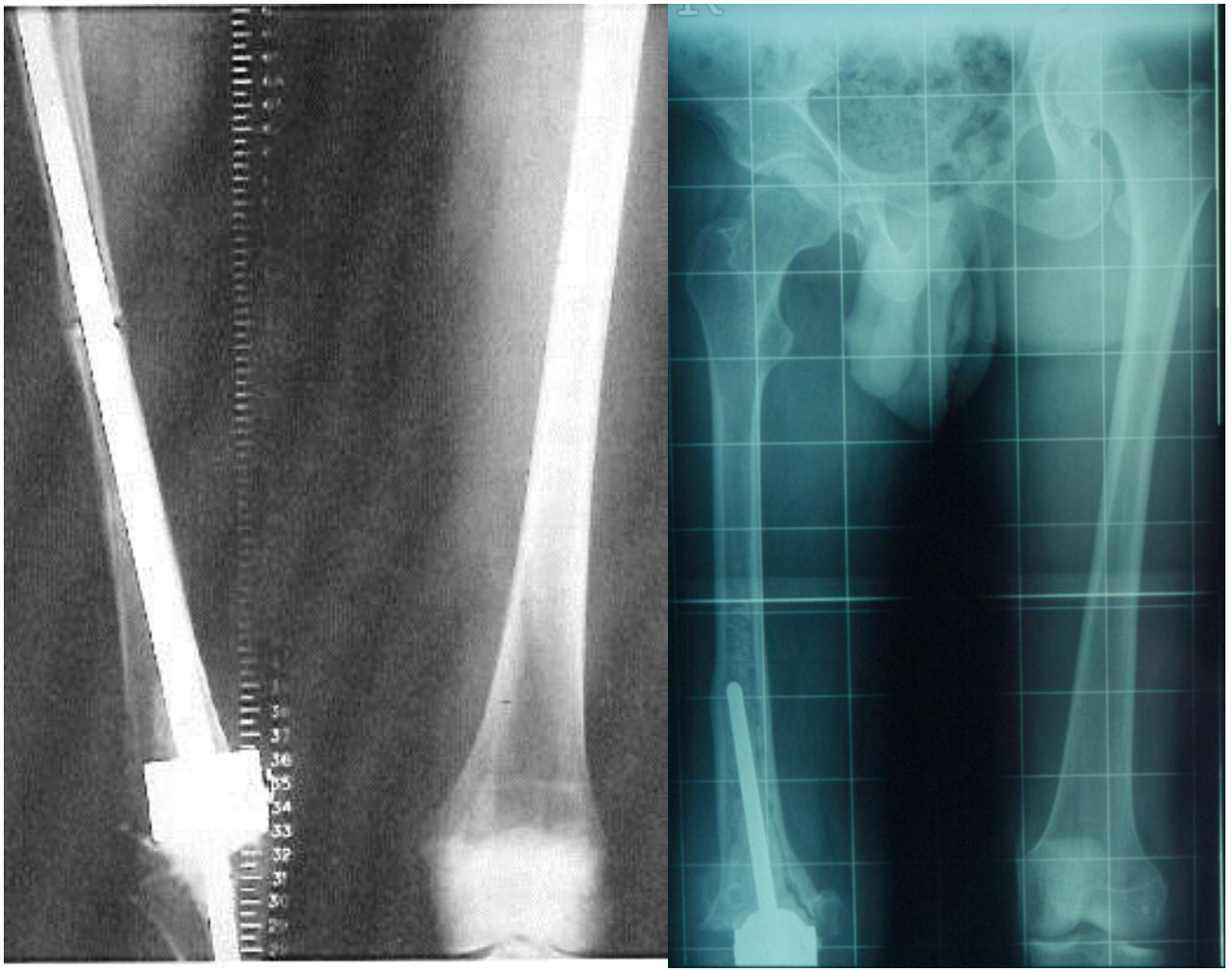
upper tibia 5.



27 early prosthesis implantation

- In 18 patients, the expanding prosthesis was inserted immediately after the resection,in 9 during the following year

23 secondary implantations to treat leg length discrepancy.



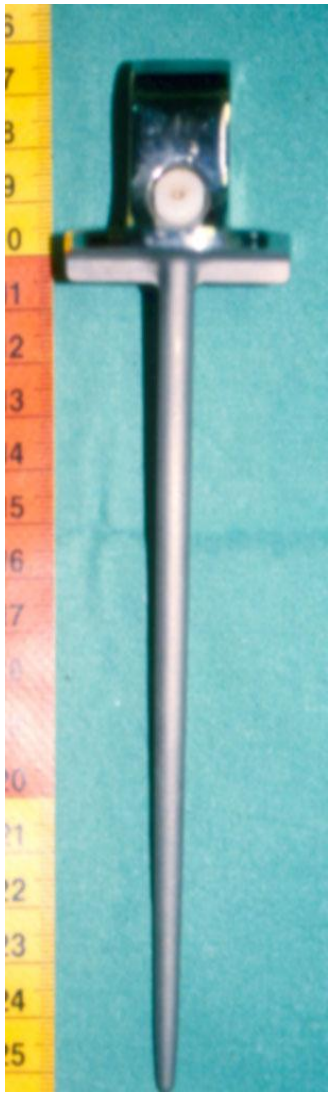
Active expanding prosthesis

- Consists of a tibial and femoral component joined by a metal on polyethylene hinge .
- The lengthening mechanism is contained in the part of the prosthesis which replaces the tumor.

Long term follow up of Expanding prosthesis

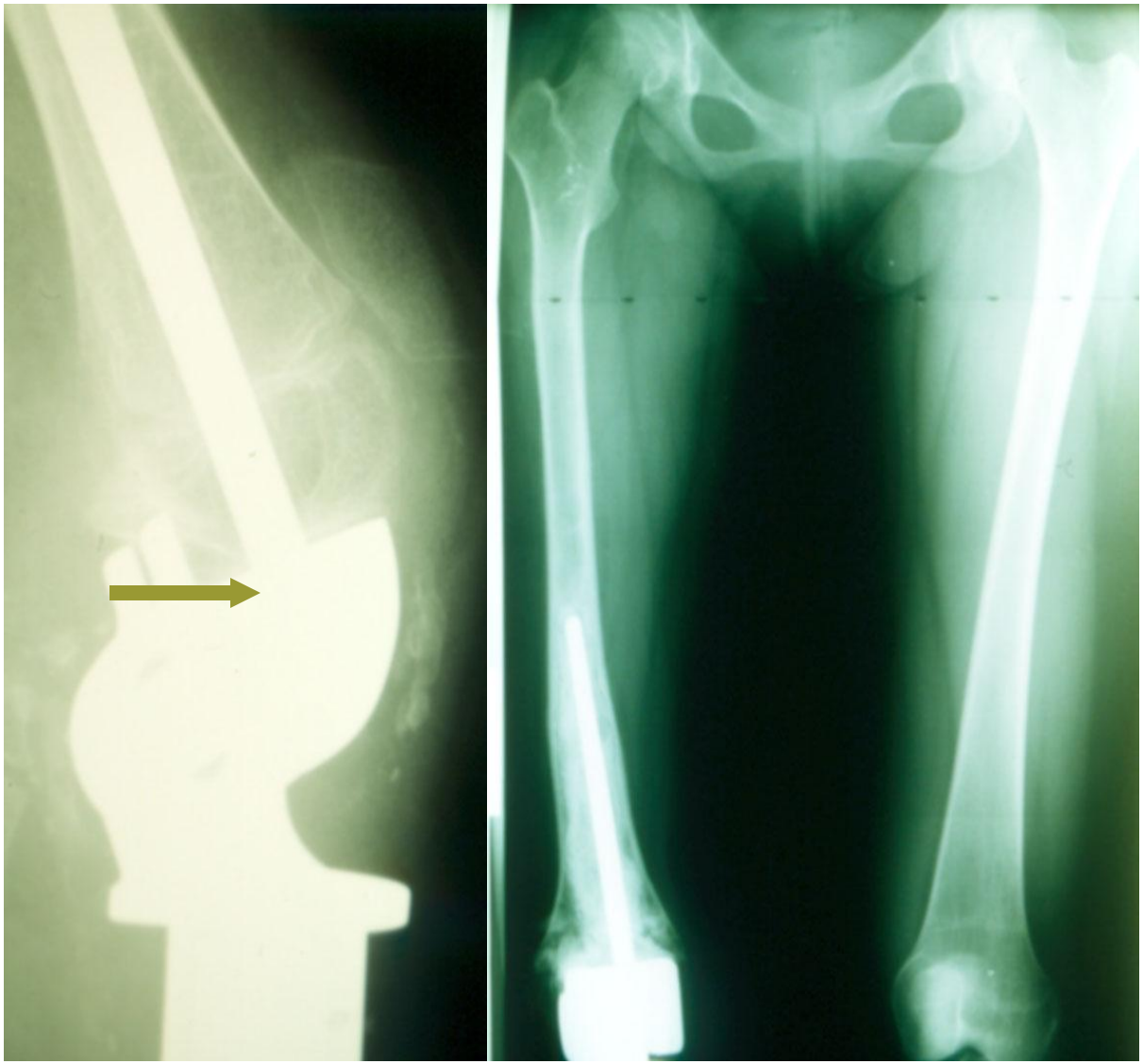
EFORT 2008 Nice

The tibial passive part for femoral tumor



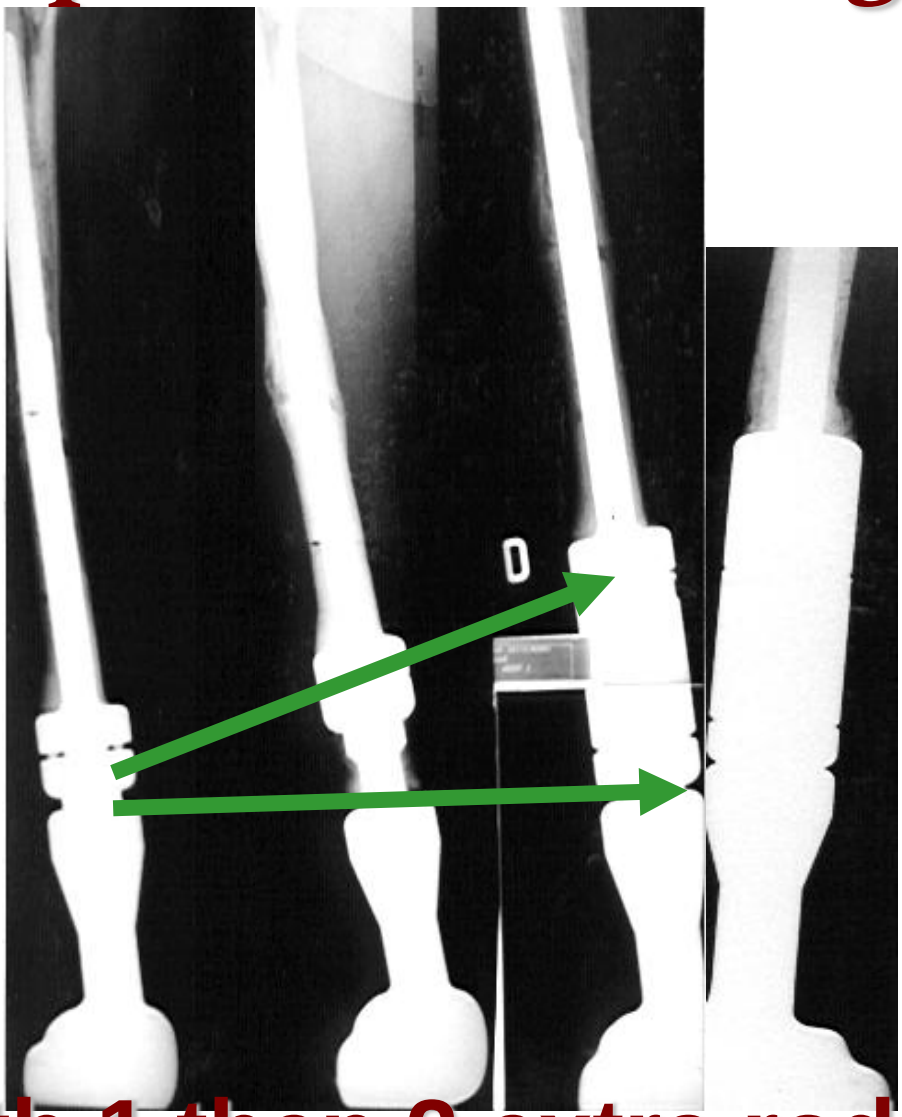
6 years after implantation the tibial growth is similar to the controlateral side

The femoral passive part for tibial tumors



8 years after implantation the femoral growth is similar to the controlateral side

Morse taper unlimited lengthening

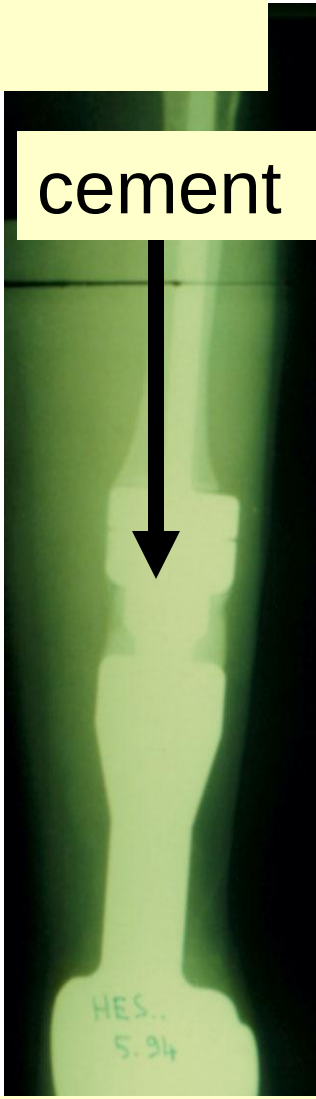


with 1 then 2 extra rods

The open sky prosthetic mechanism Zimmer Delepine (ZD1)

The generation 1 « open sky prosthetic mechanism »used a threaded rock which was turned by a screw driver inserted into the knee in the line of the femur.

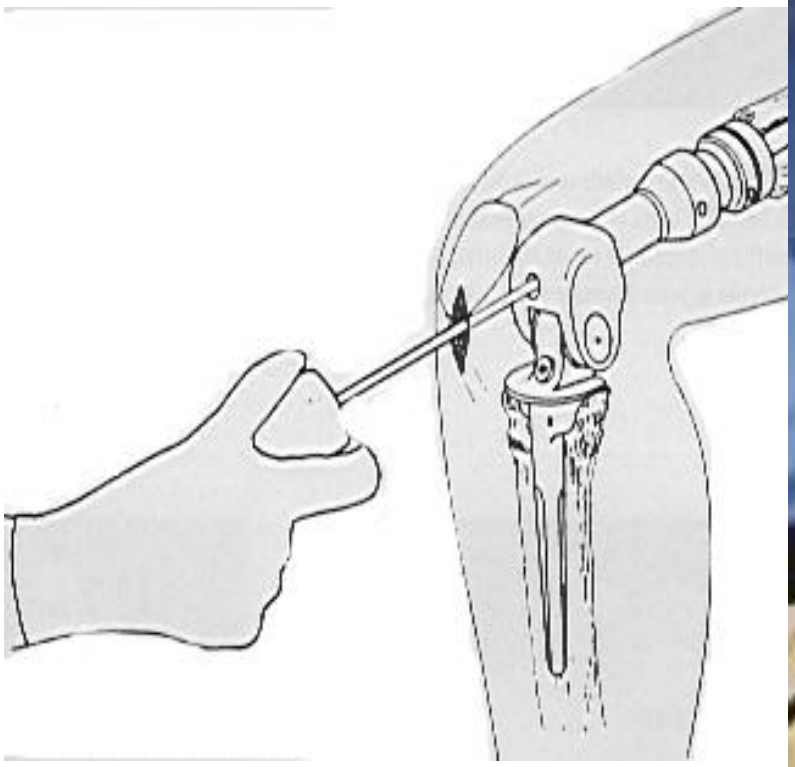
Screw driver



It was insufficiently stable to maintain position and had to be reinforced by using a wedge of acrylic cement.

the arthroscopic prosthesis

- a better anticollapse device
- elongation is produced arthroscopically using small puncture incisions

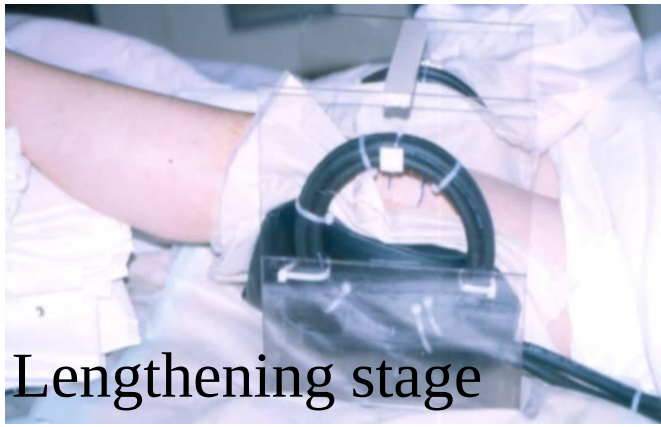


Long term follow up of Expanding prosth

magnetic prosthesis
Soubiran - Delepine (SD3)

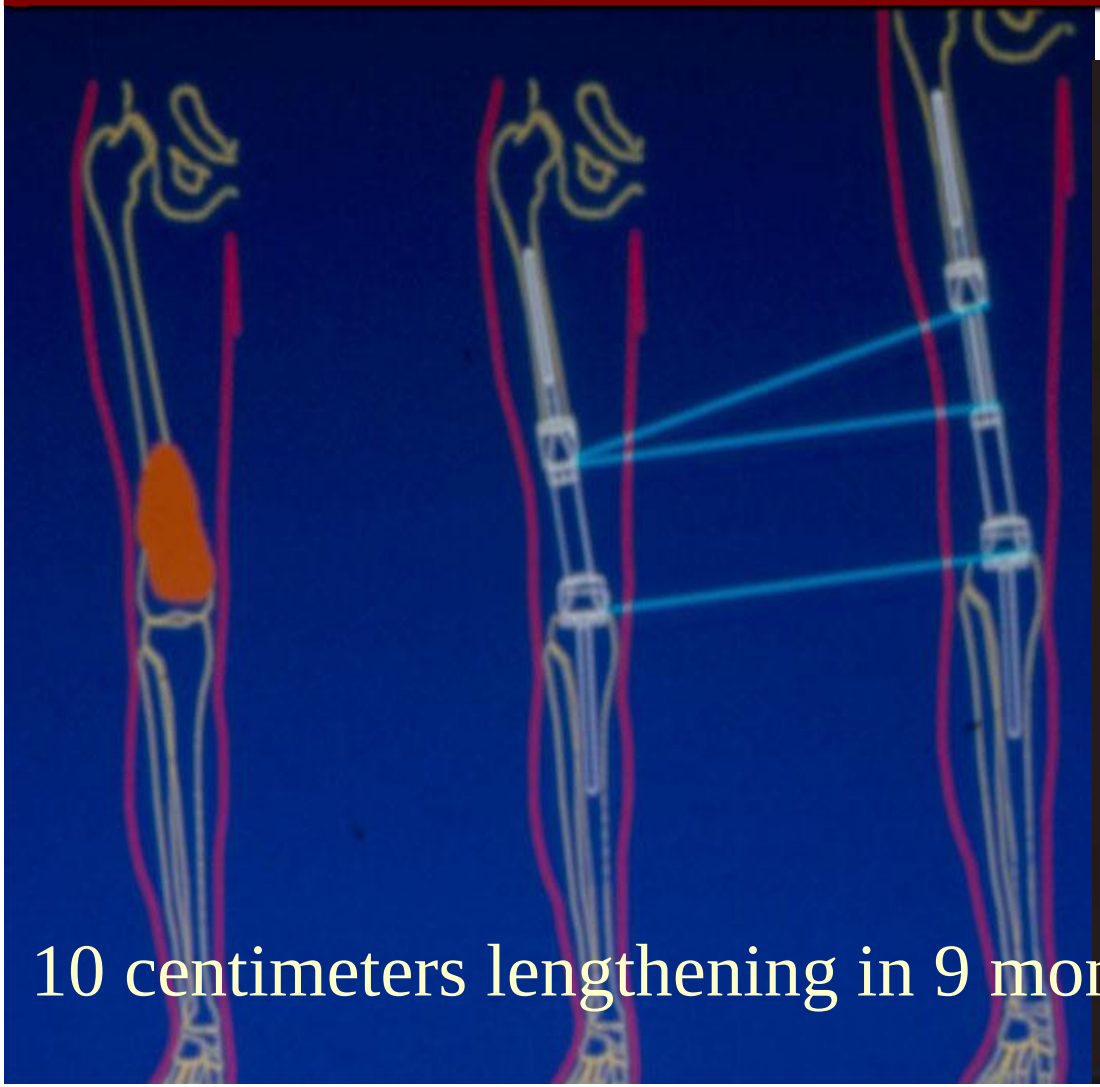
- The generation 3 prosthesis depends on a compressed spring which can be adjusted by using magnetic stimulation applied externally.
- As there is no need for any incision lengthening, it can be achieved in stages, each of a few millimeters.

Magnetic field generator



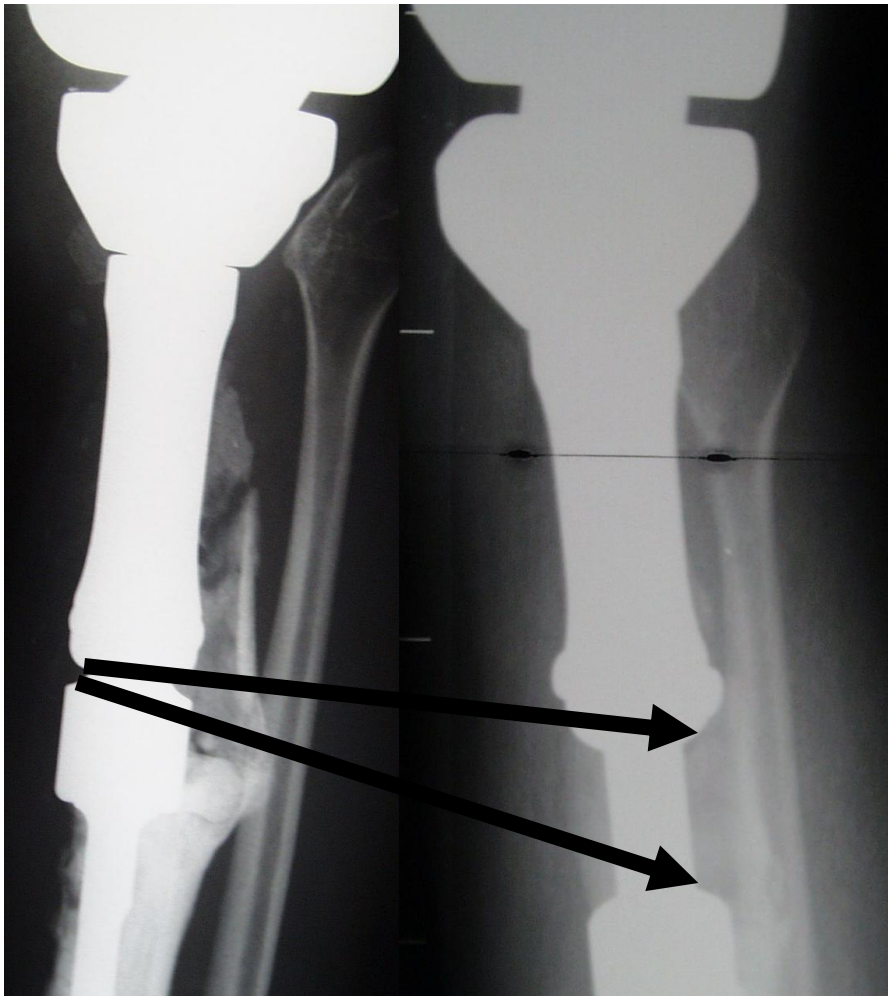
Lengthening stage

Elongation of a magnetic prosthesis for distal femur(SD3)



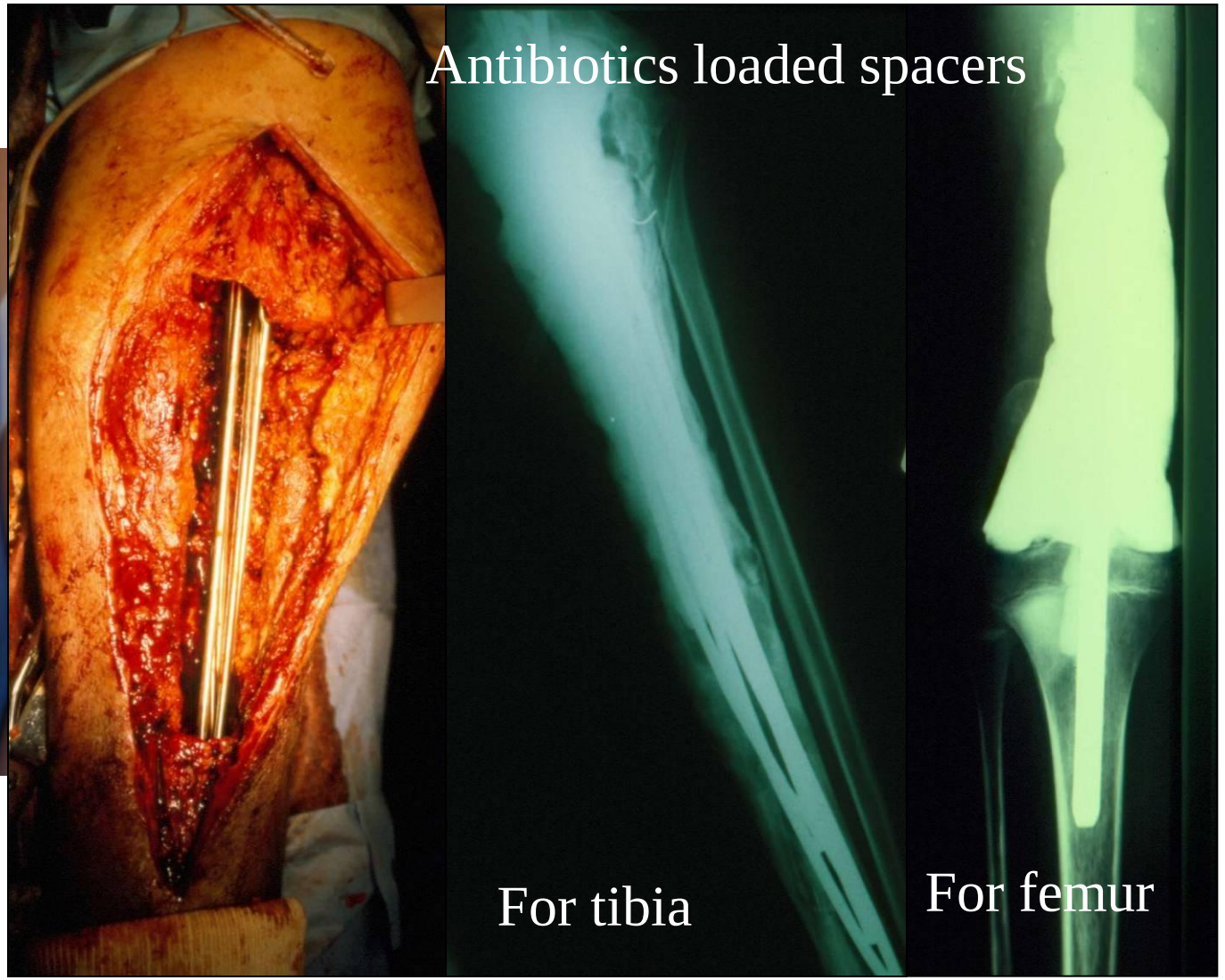
10 centimeters lengthening in 9 months

Aspect of elongation of a magnetic prosthesis for proximal tibia (SD3)

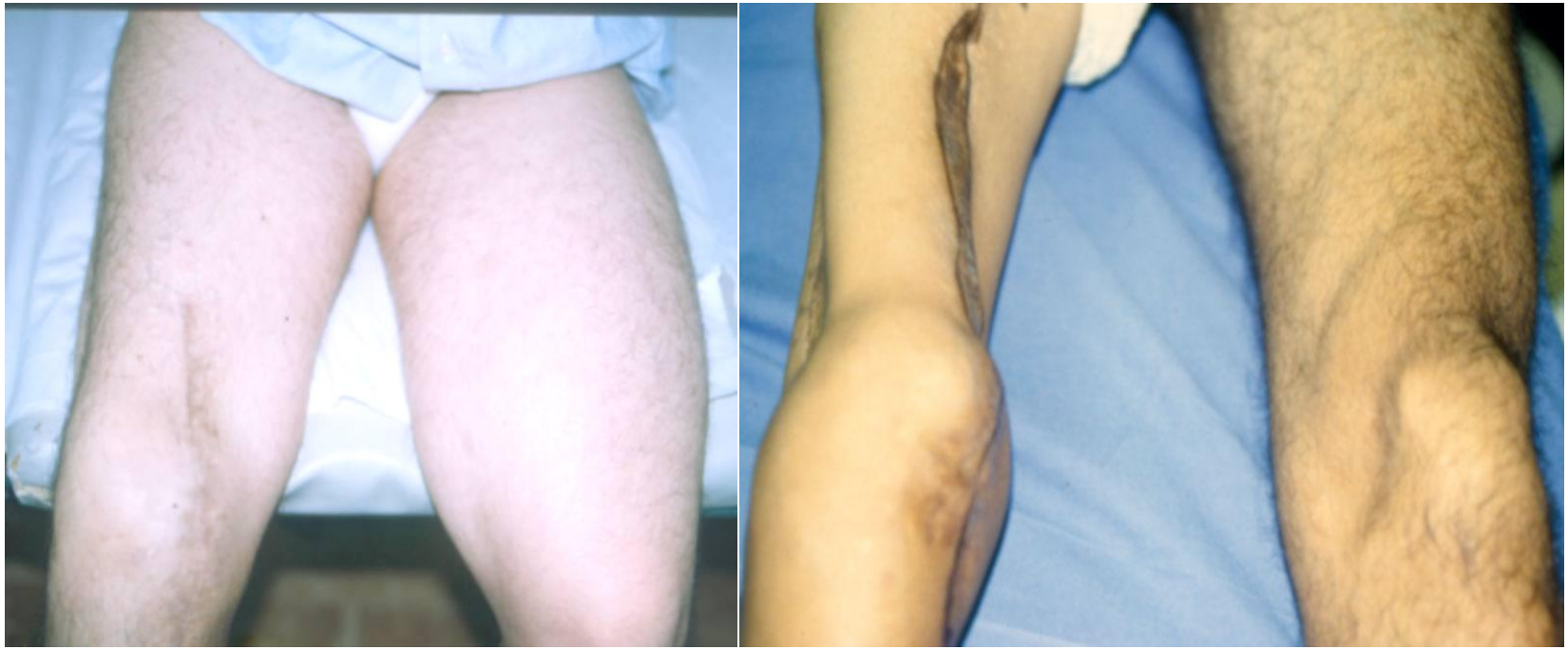


Deep infection

Spontaneous skin breakdown



trophic sequellaes

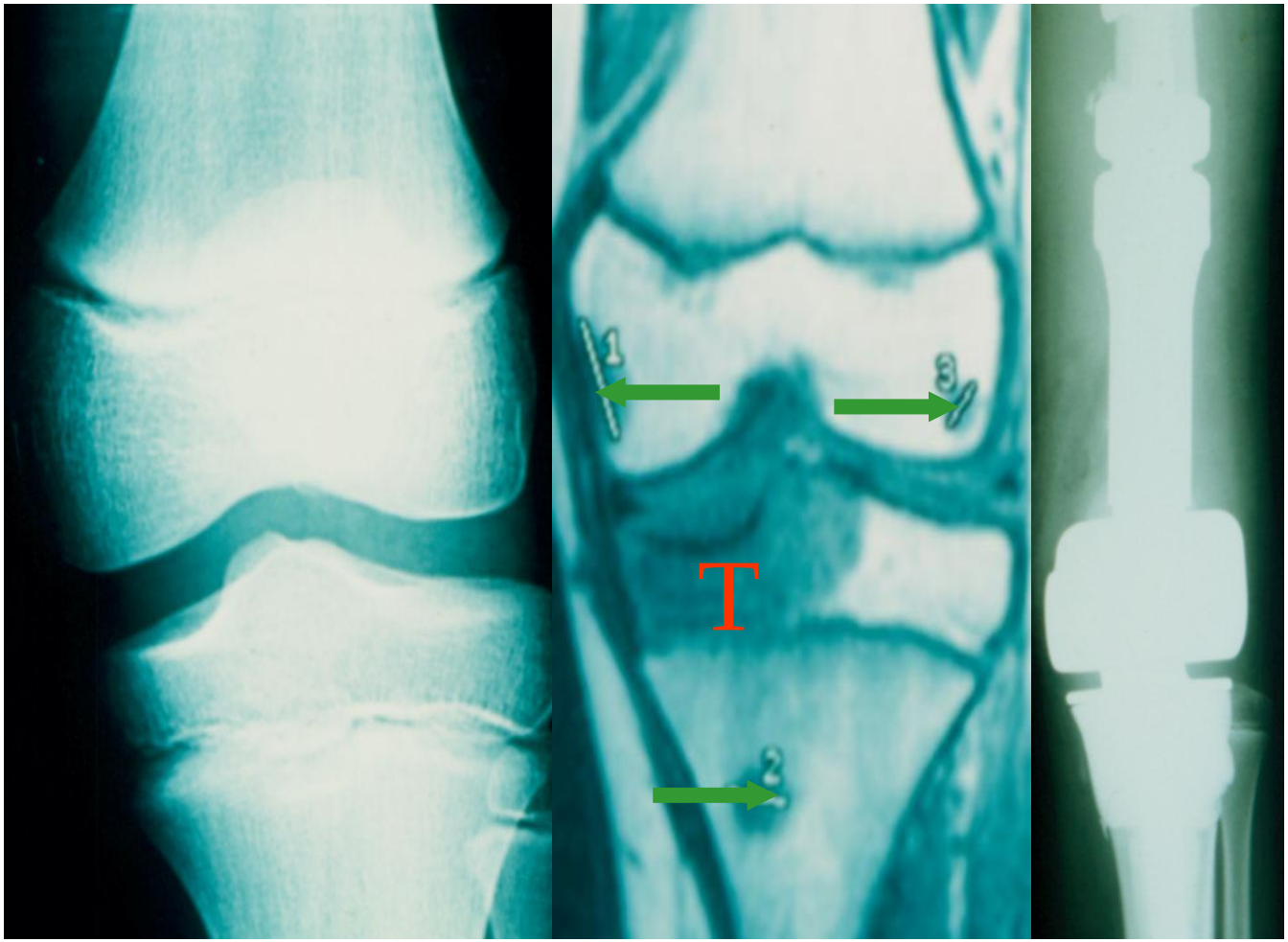


if we obtain a usually a good lenght, the lenghtening can lead to trophic sequellaes

late functional result (according to EMSOS criteria)

- Excellent 10
- Good 15
- Fair 10 (total femoral reconstruction and stiff knees)
- poor 5 (among them 4 secondary amputations)

bifocal Resection

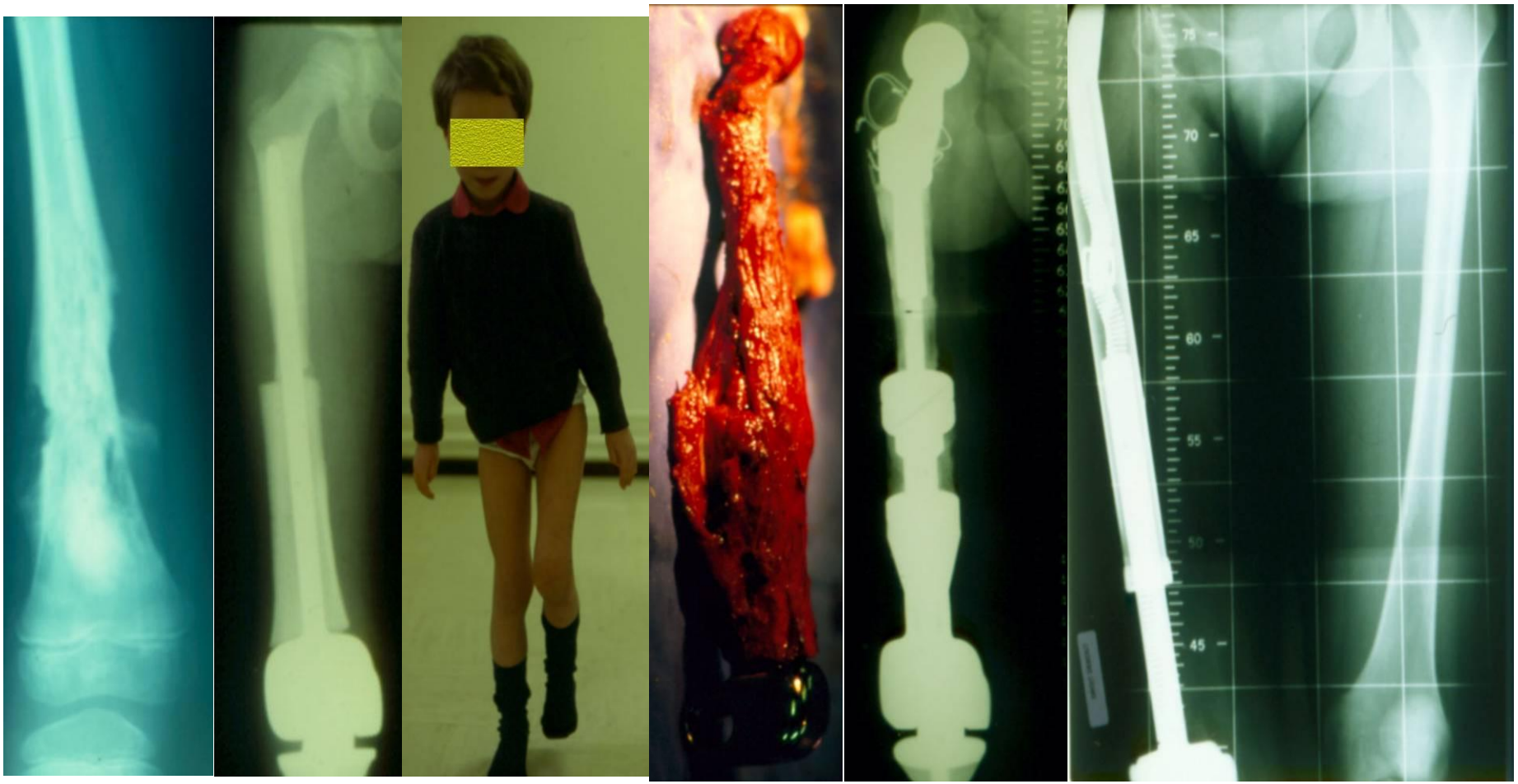


Upper Tibial Ewing's Sarcoma with 3 skip metastases on NMR. Bifocal Resection.

1989 Osteosarcoma in a 4 years old boy

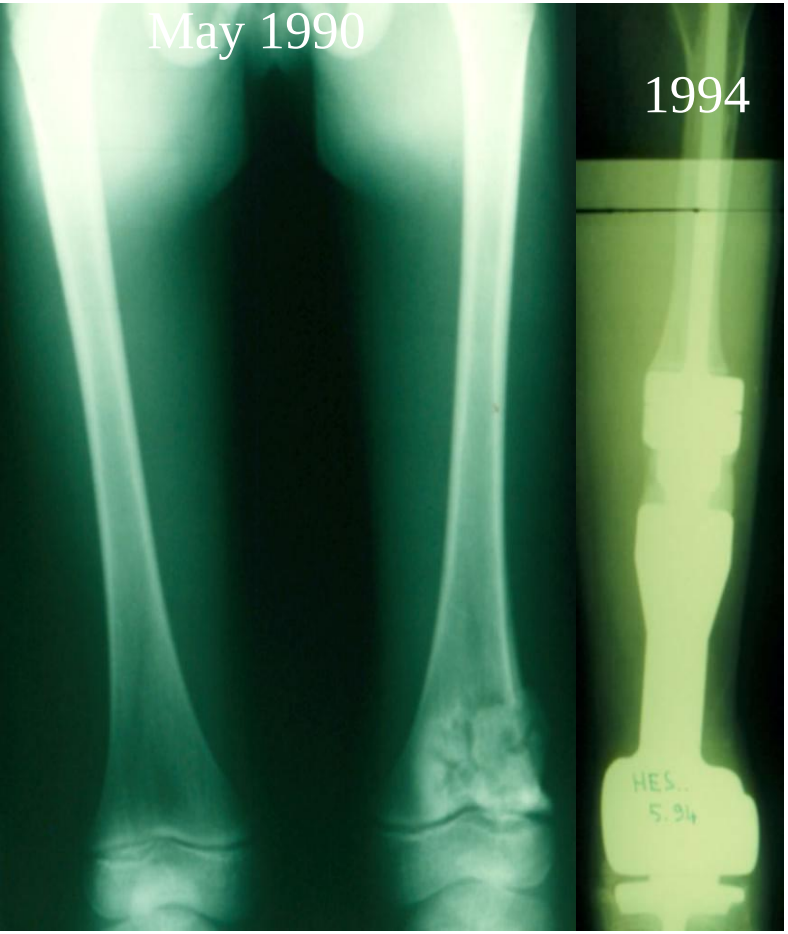
2007,18 years after resection

4 years old girl



03 1984 01 1985

:Osteosarcoma in a 7 years old girl.



osteosarcoma of the proximal tibia in a 10 y old girl (13 Y FU)

1992

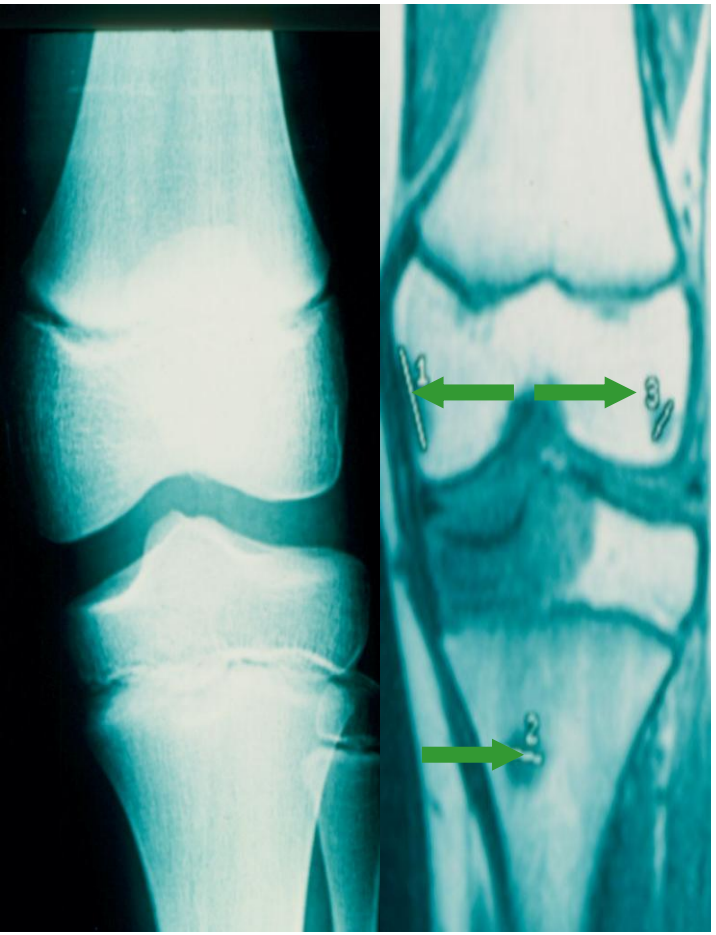
1994 1997

Expanding tibial prosthesis (T SD3)

8/2007

Allograft composite P

Bipolar Resection

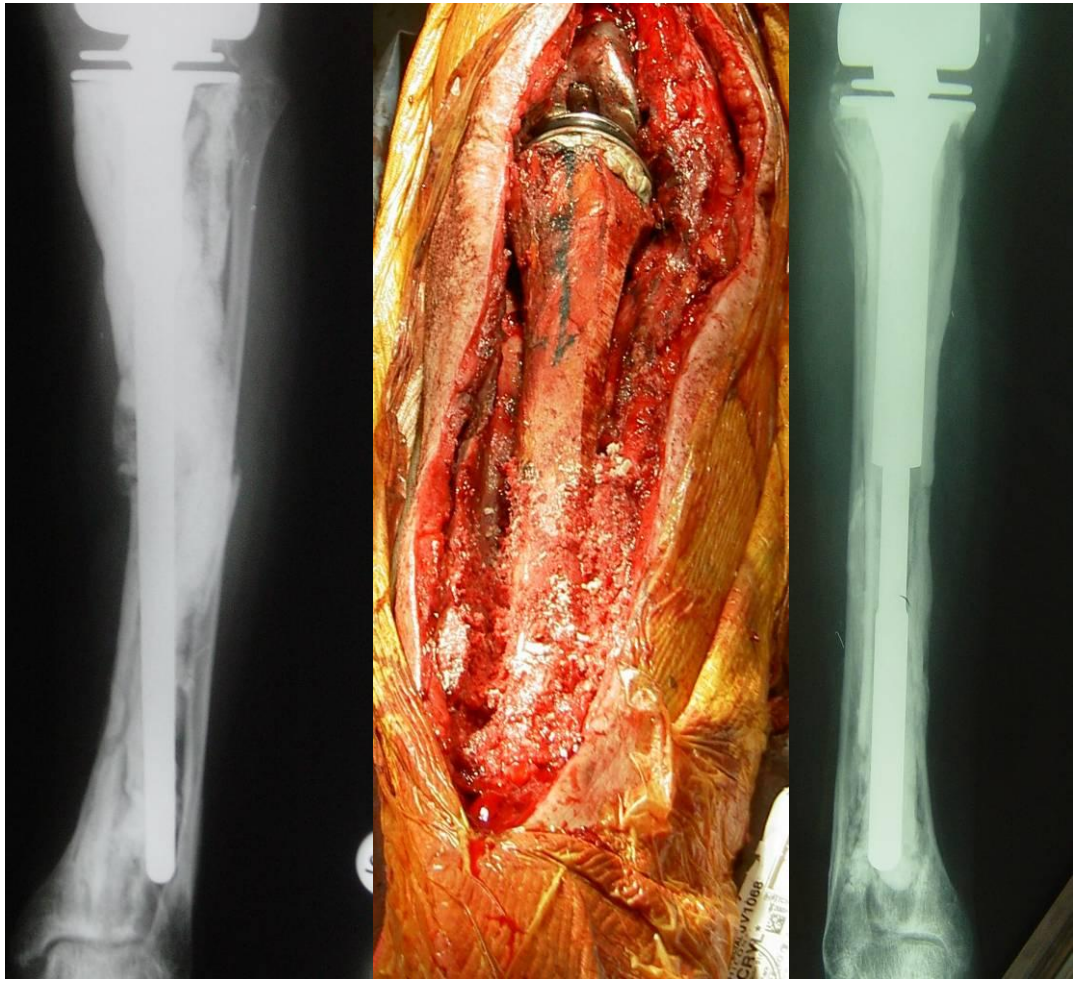


Distal femur expandable prosthesis

After large lengthening bone stock may become insufficiant

- Patient treated for osteosarcoma of proximal tibia when she was 9 years old.
- 10 years later and after 6 operations the proximal part of femur became too small.

In these cases we advocate to reconstruct the bone defect with an allograft



CONCLUSION :

The expandable prosthesis provides an effective alternative to amputation for about 80% young children .

But the number of operations is high for large lengthening

with a high rate of infection,

frequent stiffness of the knee,

and at the adult age , poor trophicity of the limb and bone stock frequently insuffisant.

Conclusion 2

- When a prosthesis of the kne is planned in a young child.
- avoiding sterilization of the growing plate of the unaffected side of the articulation is mandatory.