BONE TUMOURS

Dr.Freih Odeh Abu Hassan

FRCS(Eng.),FRCS(Tr.&Orth.)

Professor of Orthopedics &

Pediatric Orthopedics Surgery,

University of Jordan

Tumour (neoplasm):

A mass of cells which proliferate in an atypical and relentless way and serve no useful function

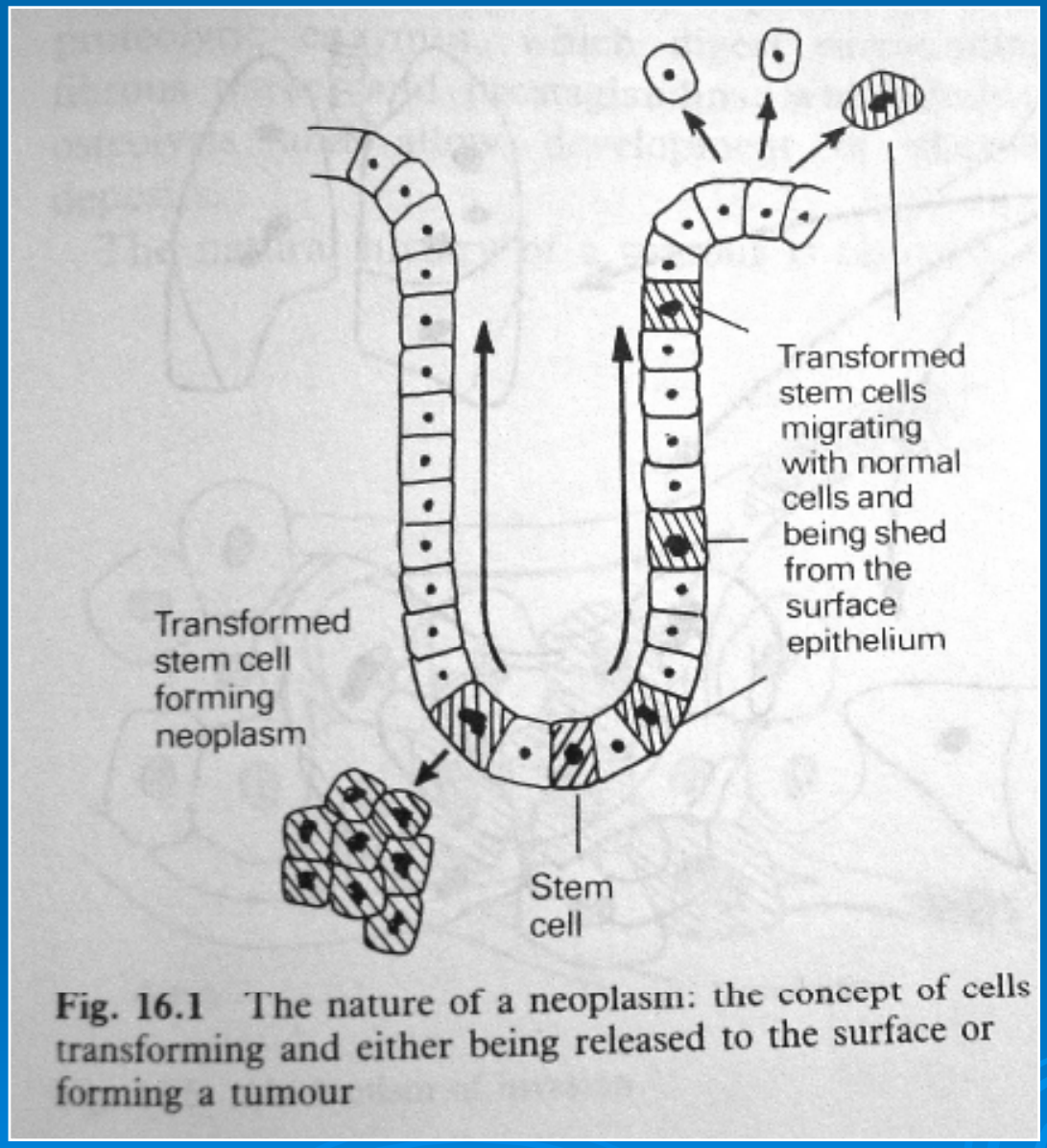


Fig. 16.1 The nature of a neoplasm: the concept of cells transforming and either being released to the surface or forming a tumour

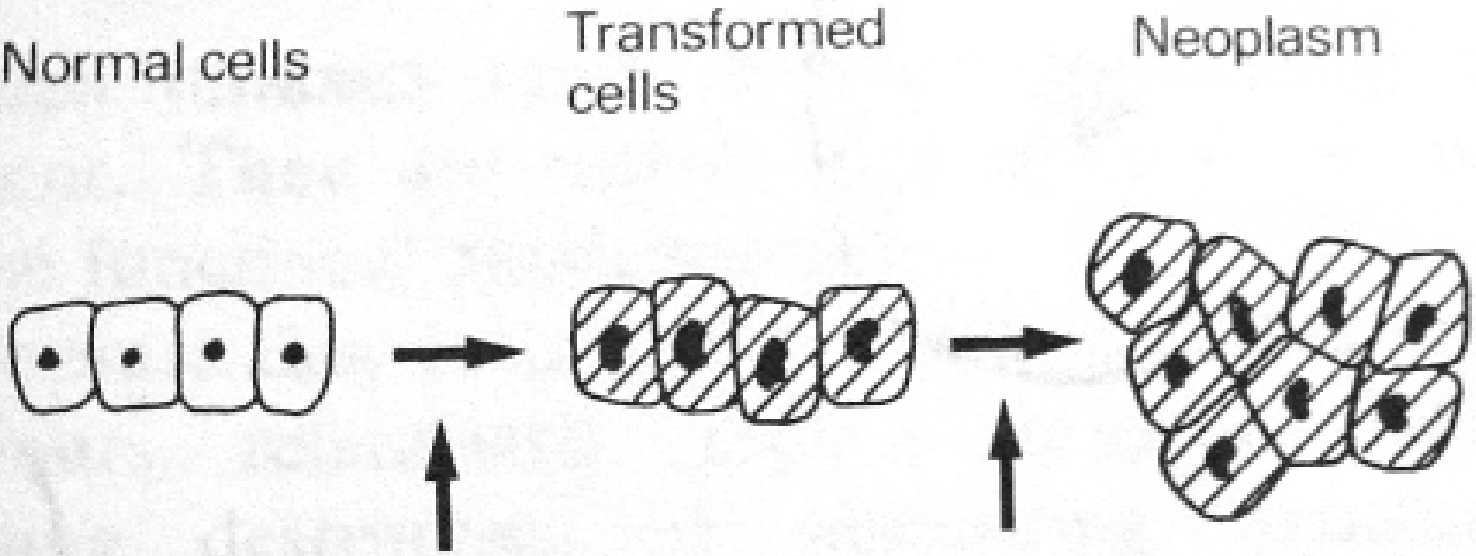


Fig. 16.2 Induction and promotion of tumour growth

Origin	B	M
=Bone	O.osteoma	O.sarcoma
=Cartilage	*O.chondroma *Chondroma *Ch.blastoma	Ch.sarcoma
=Marrow		Ewing's Myeloma
=Notochord		Chordoma

Origin	B	M
=Tumour like	Cysts , E.G F.dysplasia	-
=Carcinoma		Metastatic
=Others	Adaman-- GCT	

Benign	Malignant
=Remain local	=Metastasis
=Well defined edge	=ill defined edge
=Local resection	=Wide resection
=Non fatal	=Fatal

Malignant Bone Tumours

= 0.5% of all primary tumours.
= In the second decade of life
= Common in males than in females.
= The most common malignant B.T are secondary metastasis

Clinical Presentation

=Asymptomatic

=Pain

=Swelling

=History of trauma

=Neurological symptoms

=Pathological fracture

Investigations in Bone Tumours

1-CBC ,ESR,Blood film
2-Calcium, Phosphorus, Alk ph
3-LDH
4-PSA, Acid phosphatase
5-Bone marrow
6-PTH
7-Protein electrophoresis

= Plain radiograph
= CT Scan bone and Chest
= Bone scan
= MRI
= MRA

Biopsy

Osteoporosis

+

Patient 45-60 y old

+

high ESR

=

Multiple myeloma

Plain radiograph

Benign tumour

A radiolucency surrounded by a smooth radiodense edges.

A moth-eaten or permeative appearance is evidence that the tumour is malignant.

Ask your self !!!!

1= Solitary or multiple lesions?

2= What type of bone is involved?

3= Which part of the bone is involved?

4= Are the margins of the lesion well defined?

5= Is there periosteal bony reaction?

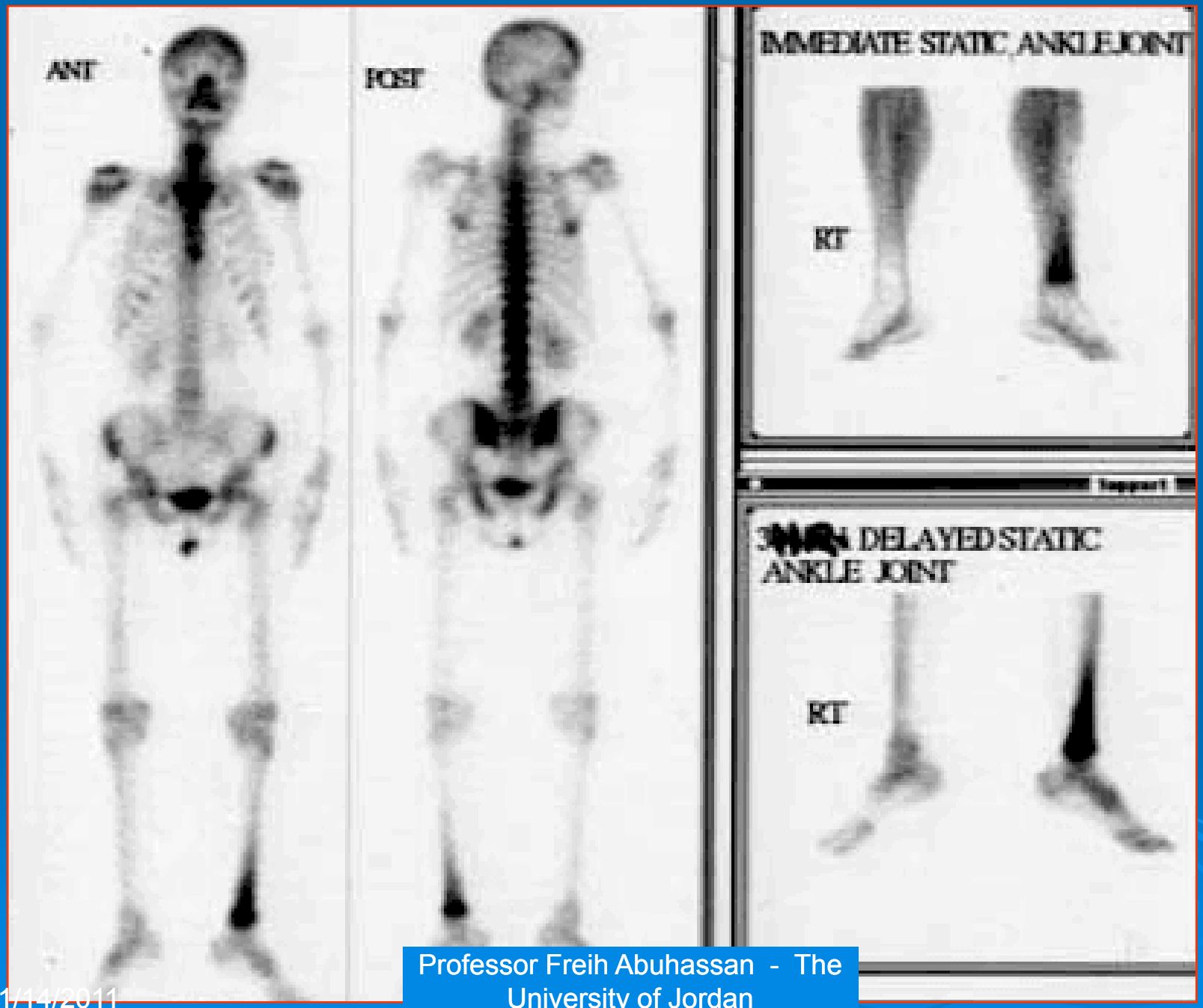
6= Does the lesion contain calcification?

Radionucleotide scanning .

Bisphosphonates labeled with isotopes are used which are taken up at the site of increased blood flow and increased bone formation.

CAT scans and MRI scans

Help delineate the extent of the tumour helping the surgeon plan the surgical approach.


ANT
POST
IMMEDIATE STATIC ANKLE JOINT
RT
DELAYED STATIC
ANKLE JOINT
RT

Differential Diagnosis

1- Osteomylitis

2- Stress fracture

3- Post traumatic swelling such as callus or Myositis ossificans

4- Hyperparathyroidism

5-Benign tumours

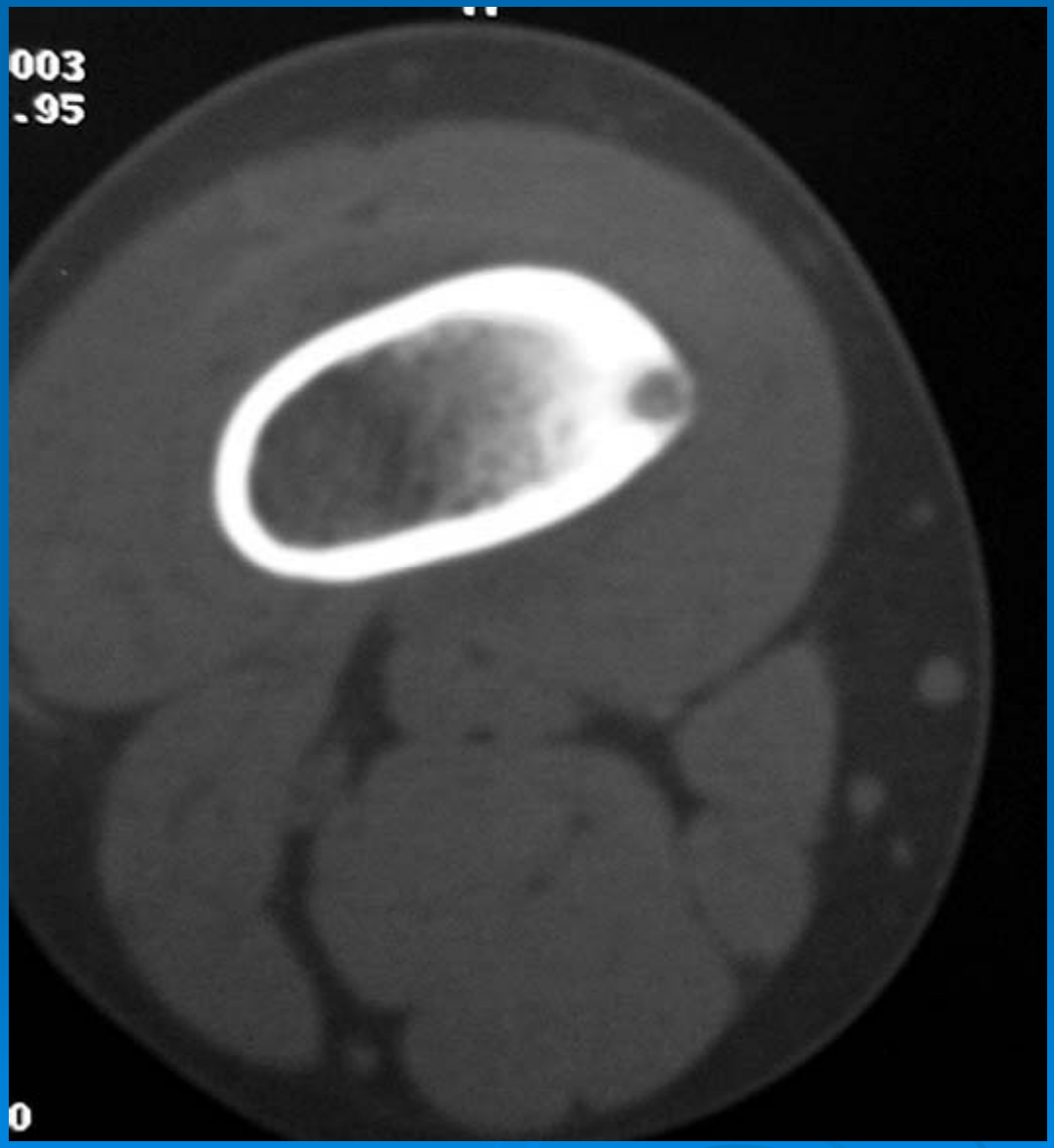
Osteoid Osteoma

= <1.5 cm

=occurring in the femur or tibia.

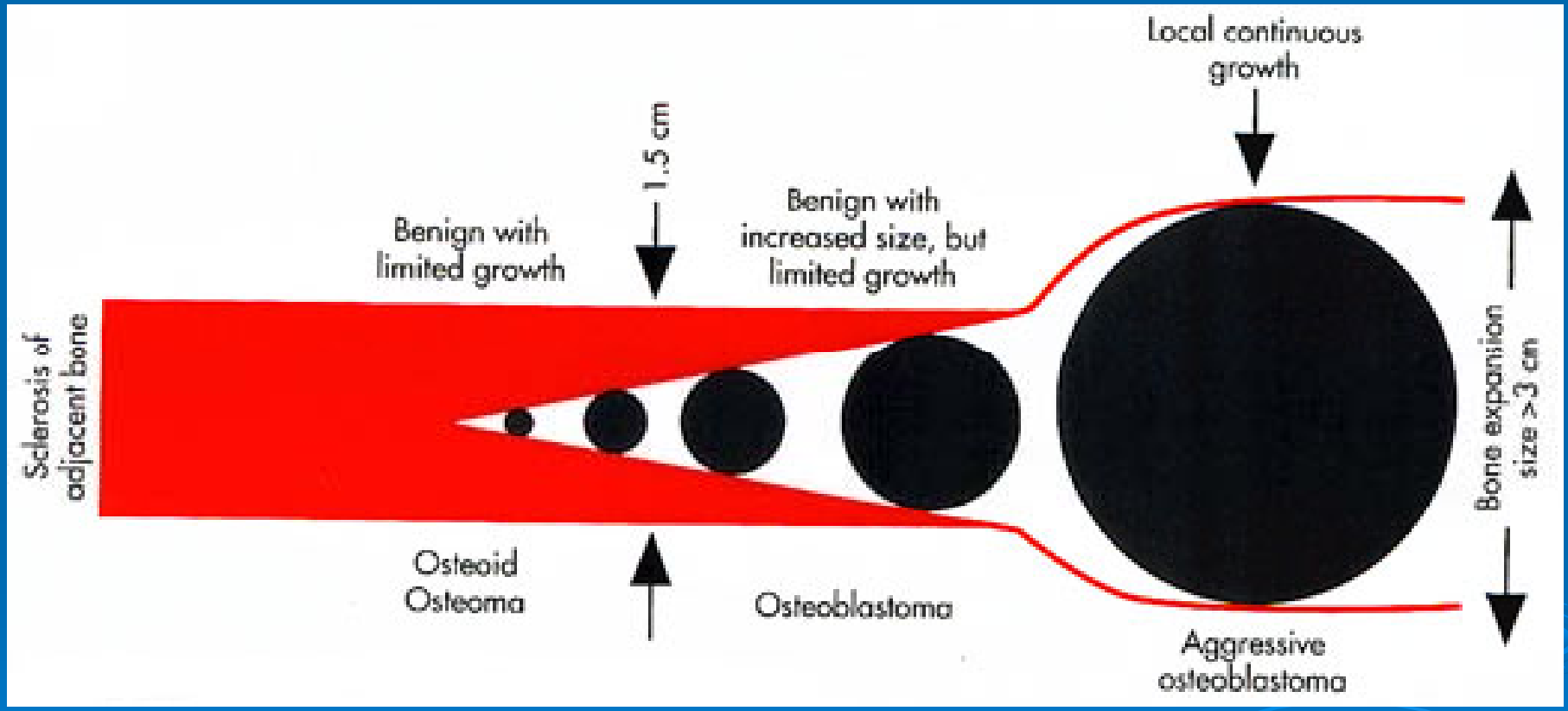
=It is composed of a central nidus of bone forming tissue surrounded by a zone of boney sclerosis.

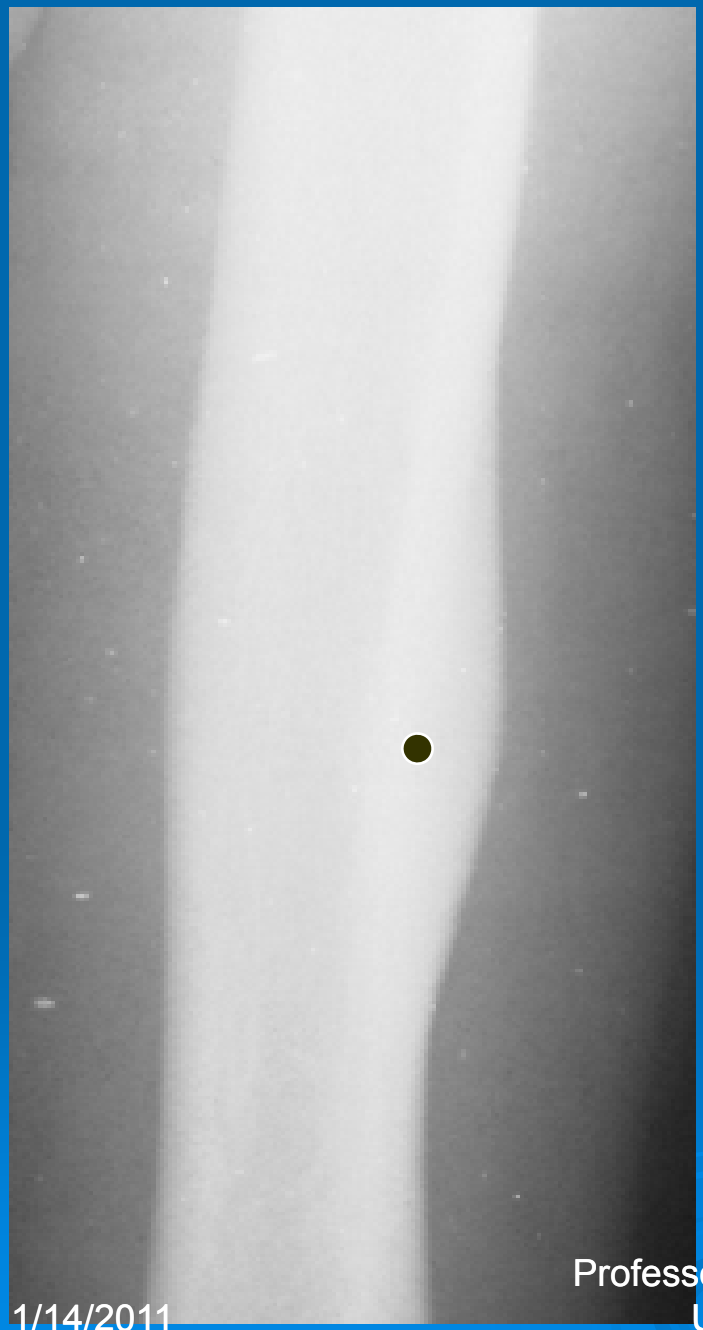
=It characteristically causes marked pain relieved by aspirin.

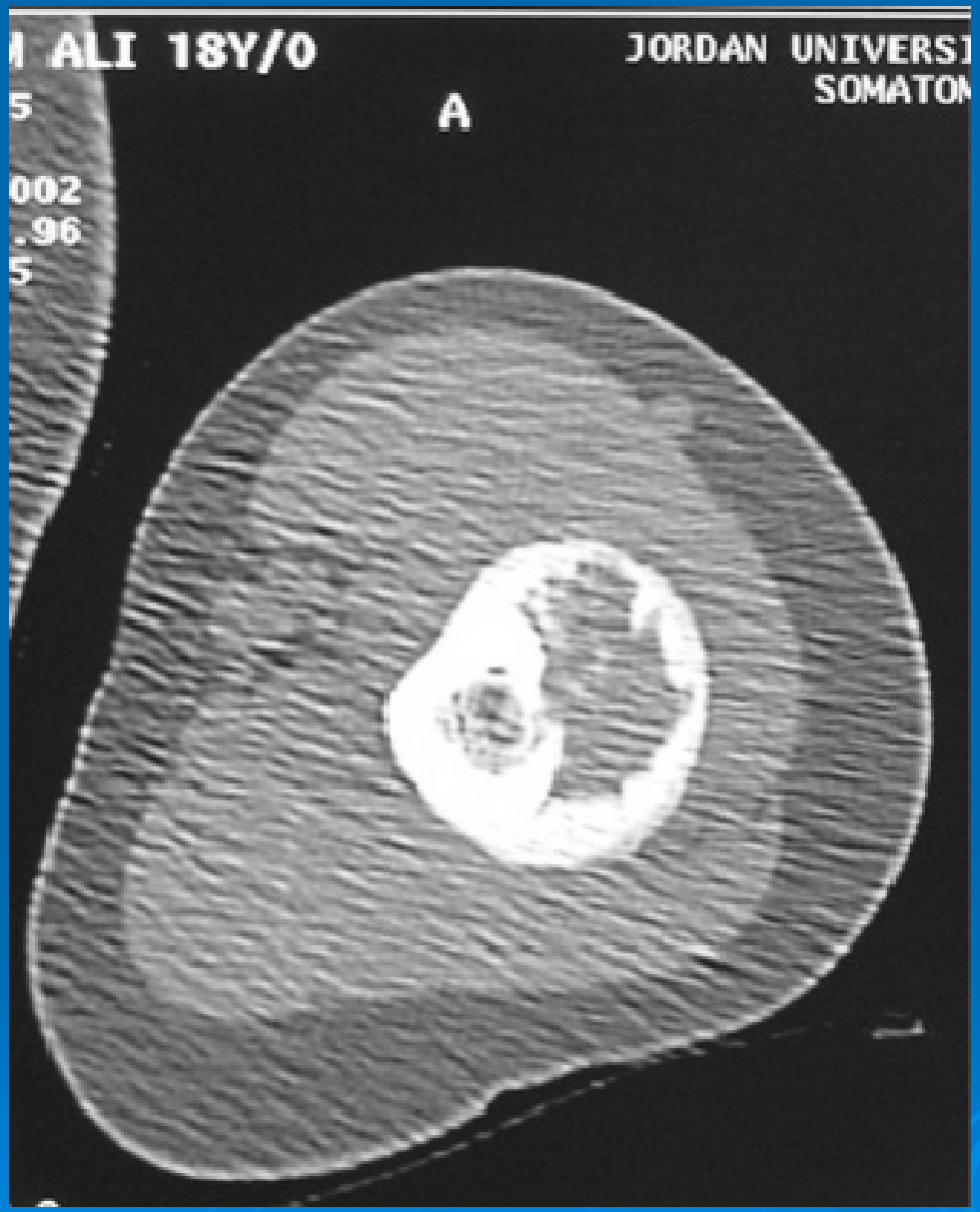

003
.95
0

Osteoblastoma

= Males in the 2nd- 3rd decade
= locally-aggressive tumour.
= 40% occur in the spinal column and sacrum .
= Osteoblastoma is (2-10 cm).


Local continuous growth
1.5 cm
Benign with limited growth
Benign with increased size, but limited growth
Sclerosis of adjacent bone
Bone expansion size >3 cm
Osteoid Osteoma
Osteoblastoma
Aggressive osteoblastoma




ALI 18Y/0
JORDAN UNIVERSI
SOMATOM
A
002
.96

Osteosarcoma

= Commonest 1ry malignant B.T.
= 60% of patients are male .
= Age incidence 10 - 20 years .
= 50% of cases around the knee
= Usually in metaphysis
= Presents with pain and swelling.

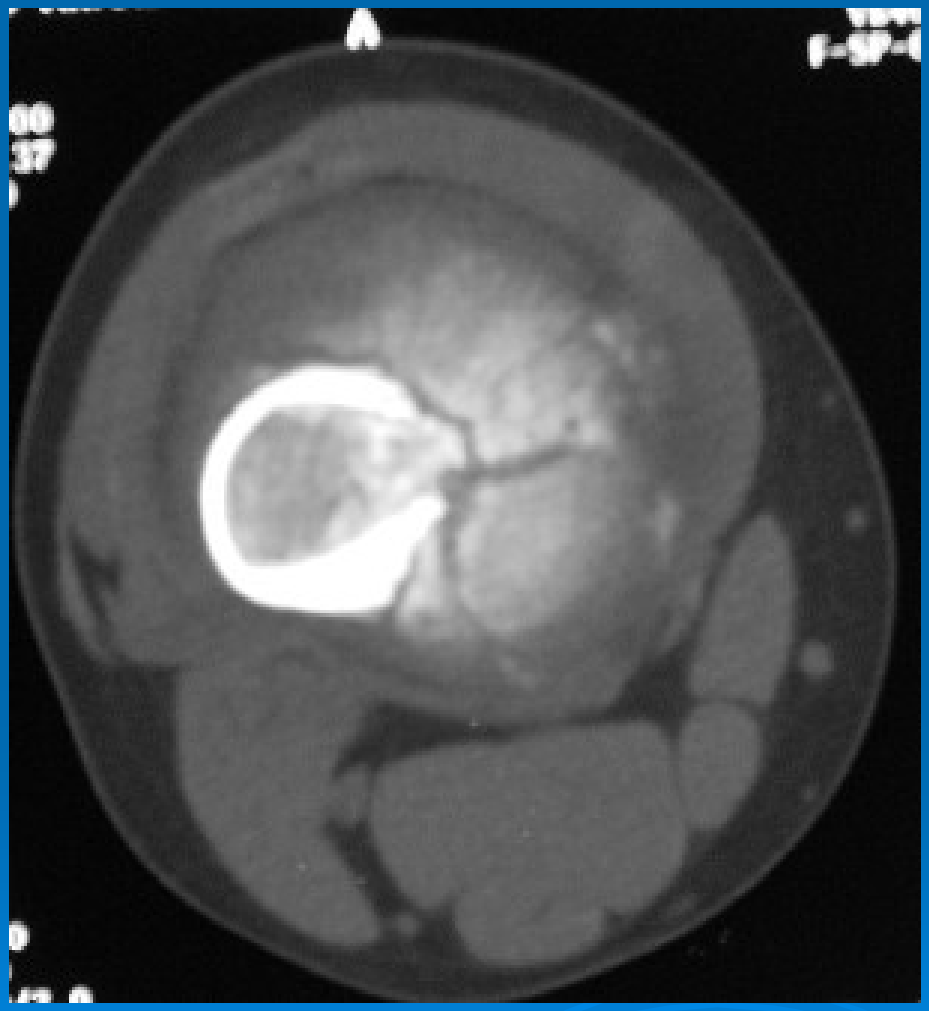
Plain radiograph

=Bone destruction and bone formation lesion with a soft tissue component.

=Medulla: area of rarefaction with ill defined edges

=Cortex: perforated

=Periosteum:Sun ray spicules & Codeman triangle



Distant Mets.

-Lung

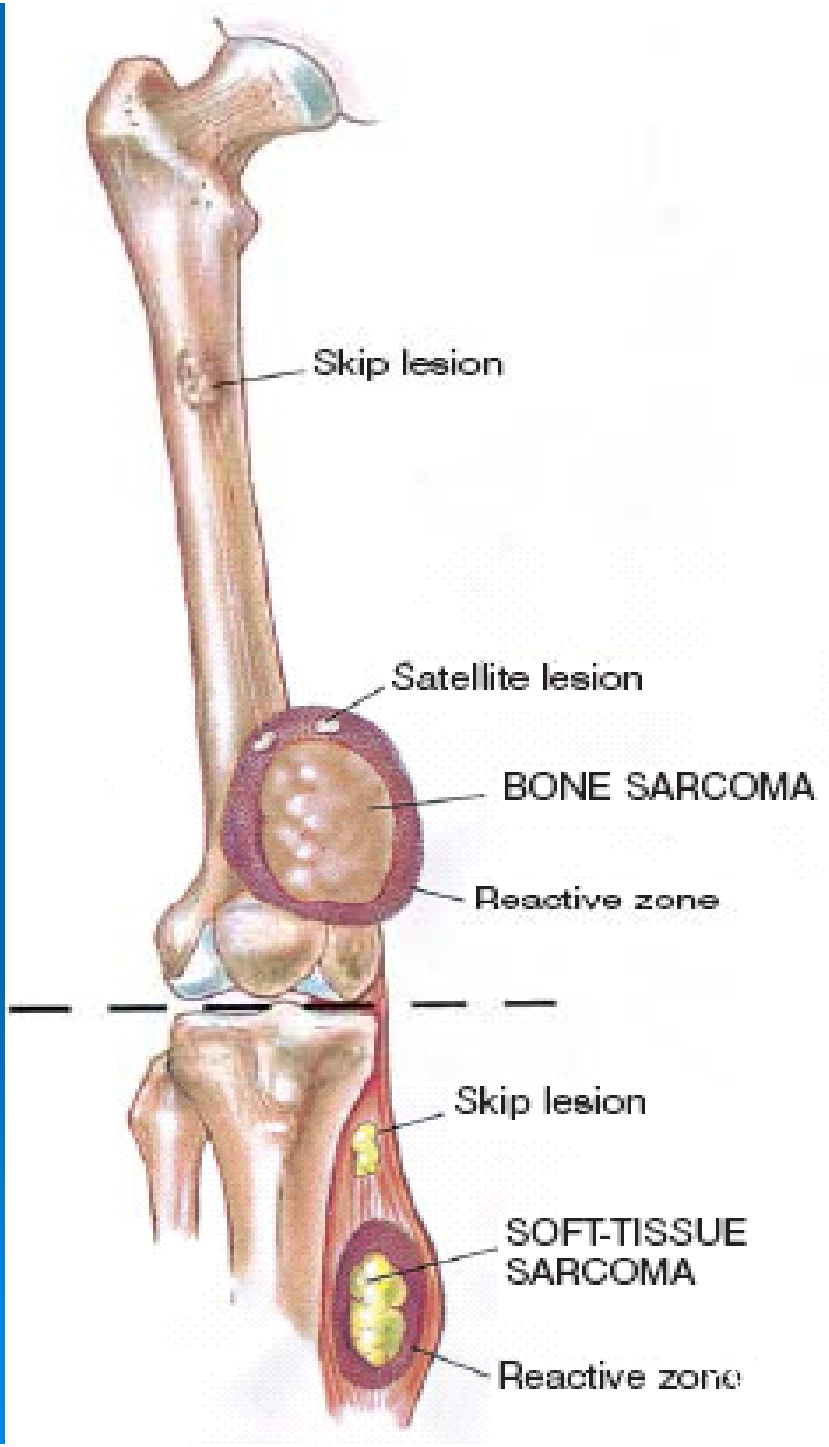
-Bone

Local Mets.

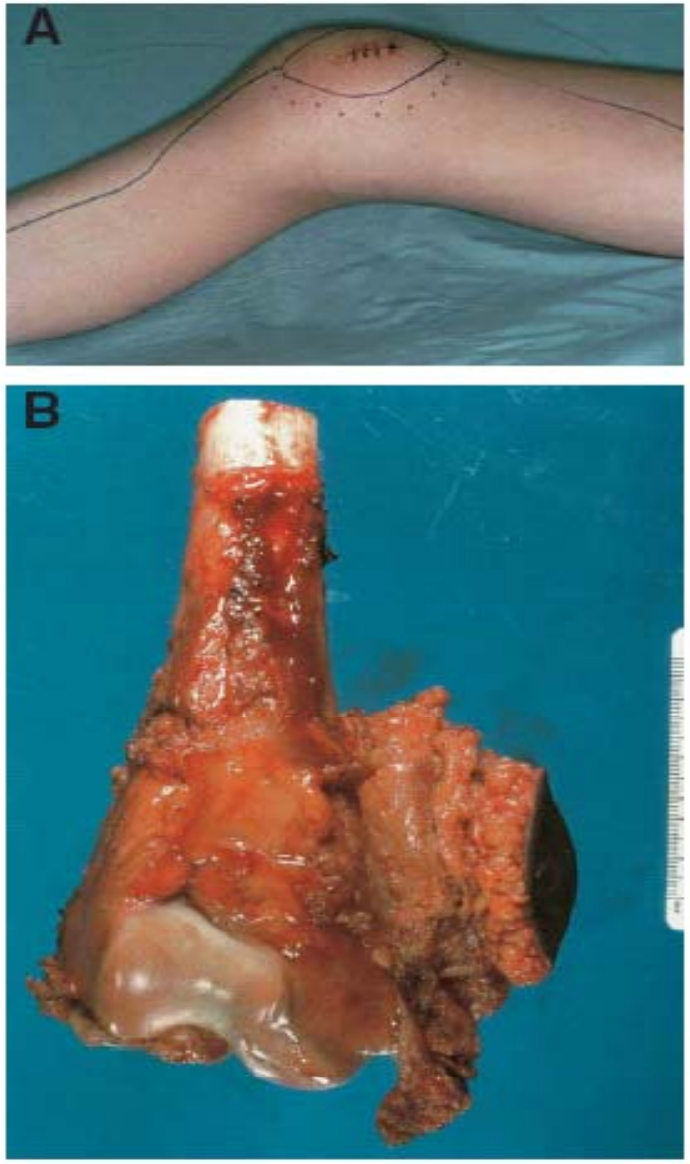
-Satelite lesion

-Skip lesion

Professor Freih Abuhassan - The University of Jordan



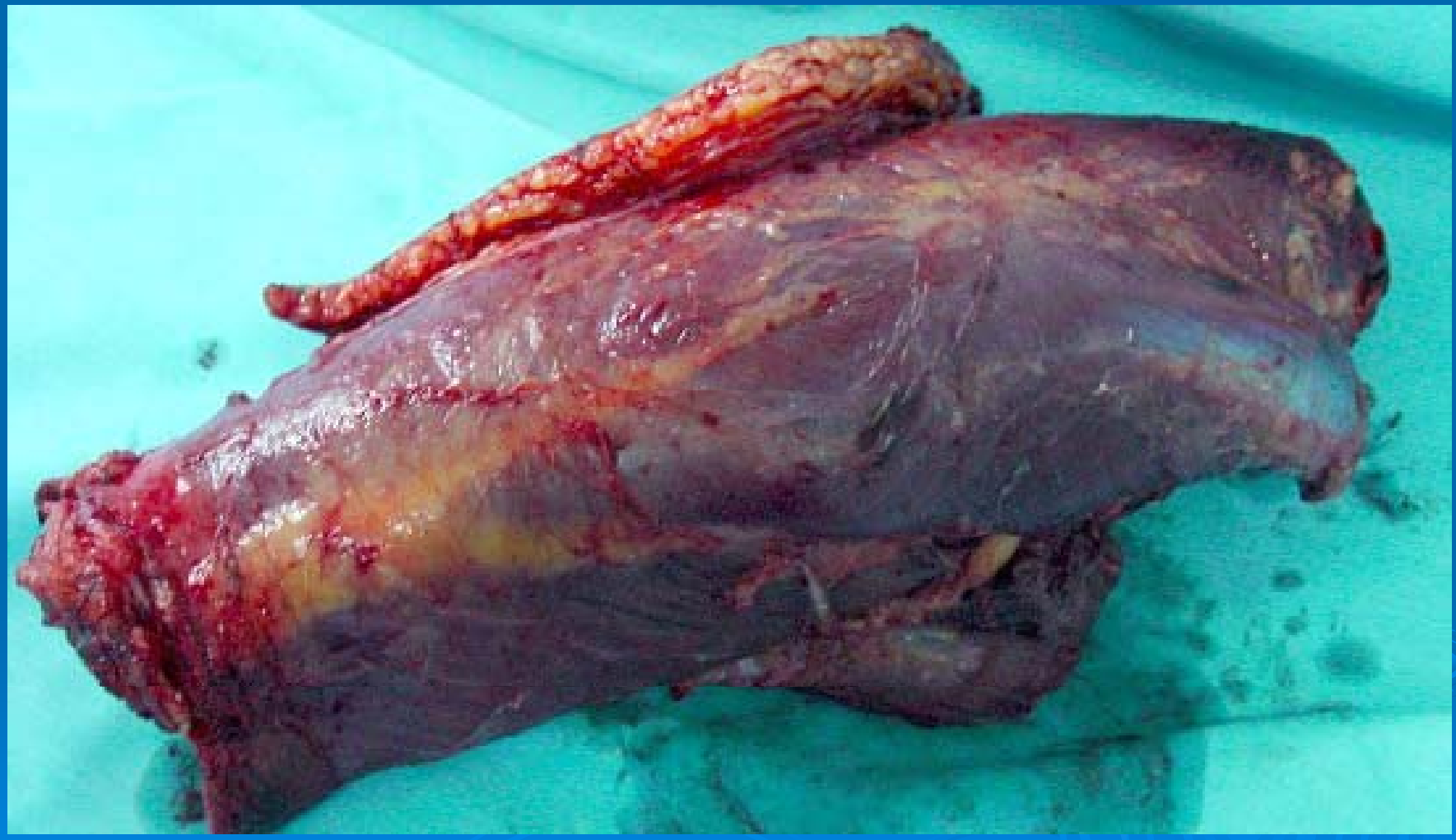

15
M
8
H
L
10 cm

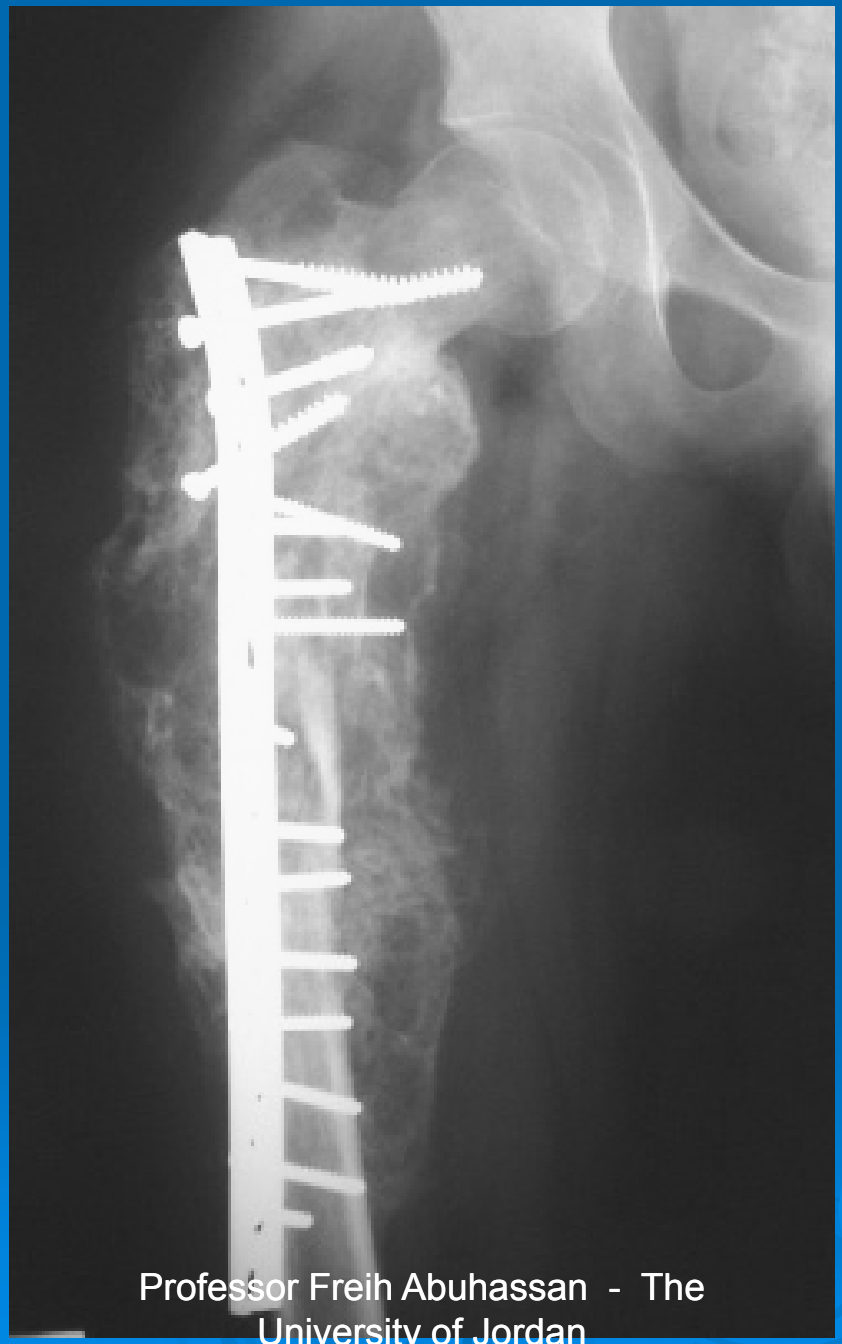

A
B

Ewing's Sarcoma

= 10-20 y
= Long bones esp. the tibia
= C/O: Pain and limp
= Increase temperature
= Mets to lungs, bones, lymph


Rt





Professor Freih Abuhassan - The University of Jordan

Osteochondroma

= The commonest benign B.T.

= Grossly the lesion like a cauliflower.

= It has a cartilaginous cap which is less than 1 cm in thickness.

= Single or multiple

Enchondroma

= Benign tumour composed of mature hyaline cartilage.

= Radiologically the lesion is usually in the diaphysis.

= It often contains calcifications

= Single or multiple

Chondroblastoma

= In young before epiph. closure & usually has origin from the region of the chondral plate of the long bones & the 2ry O.C, 50% in G. trochanter of the femur, humeral tuberosity etc.

The sites of chondroblastoma

= Distal femur,proximal tibia 17%
= Proximal femur 16%
= Proximal humerus 17%

Radiographic features

= Medullary in origin in > 90% of cases.
= Eccentrically located always touching the epiphyseal plate.
=The size of the lesion varies from 1 -10 cms with spherical / oval shape


2002
1 04
21
.0

Chondrosarcoma

= Malignant cartilage tumour.
= Occur in adulthood or old.
= 60% of the patients are male.
= 25% 2ry to osteochondromas and enchondromas.
= Mainly presents with pain.
=Late mets

X-rays

usually show osseous destruction by the tumour and mottled densities within it.

Treatment

WIDE LOCAL RESECTION

Metastatic Bone Tumours

1- Breast

2- Prostate

3- Bronchus

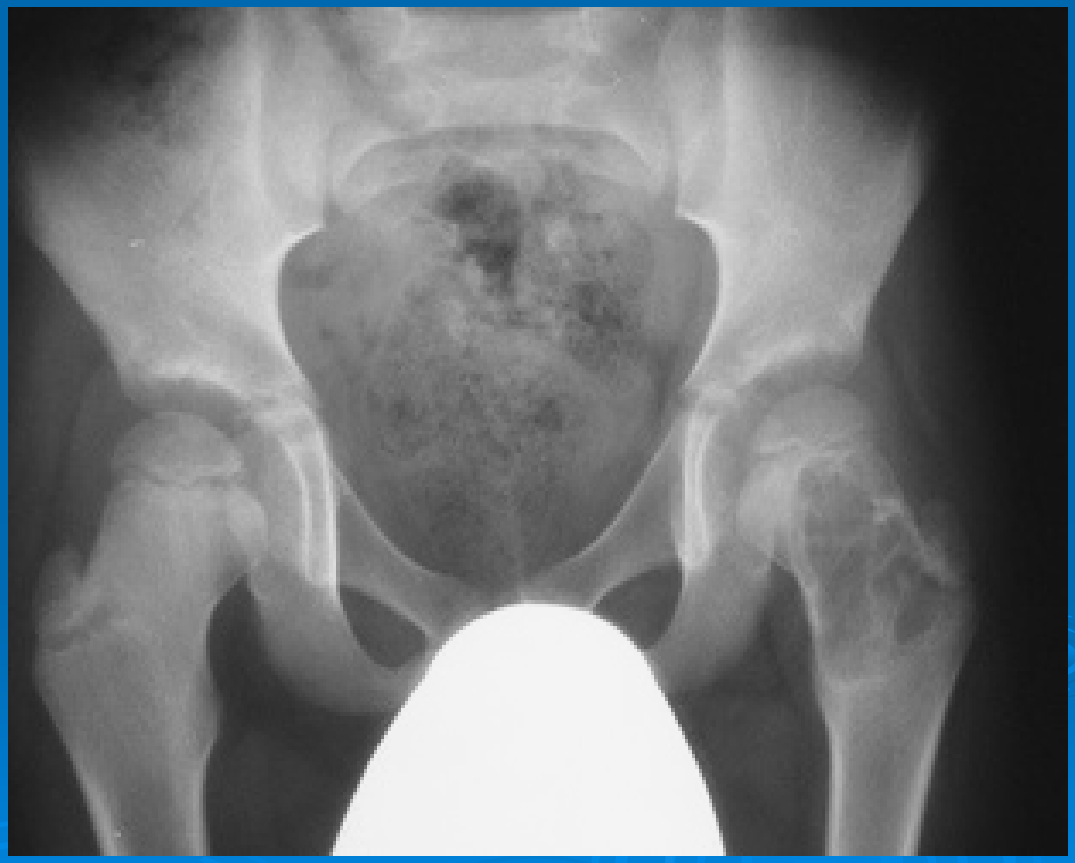
4- Kidney

5- Thyroid

6- GIT

Tumour like lesions

Bone Cysts



Giant cell Tumour

Age: 20 - 40

Presentation

-Pain.

-A mass increasing in size.

Pulmonary mets 1-2%

Giant cell Tumour

Sites:

=epiphysis of the major long bones

-distal femur
-proximal tibia.
-vertebral body.
-Radius

stage 1. Benign
stage 2. Active-Local malignant -60%
stage 3 locally aggressive-30%

Stage 1 GCT

=Curettage/bone graft

Stage 2 GCT

=Curettage/cementation

=Subchondral bone grafting/ cementation

Stage 3 GCT

1=Wide resection/arthrodesis

2=Wide resection/modular prosthesis

3=Wide resection/osteoarticular allograft

Radiation Therapy

=clinical recurrence occurs in 15 – 25%
= late radiation-induced sarcoma < 5 %


Spir
Tilt:
L


83
7
SP

Malignant Bone Tumours Treatment

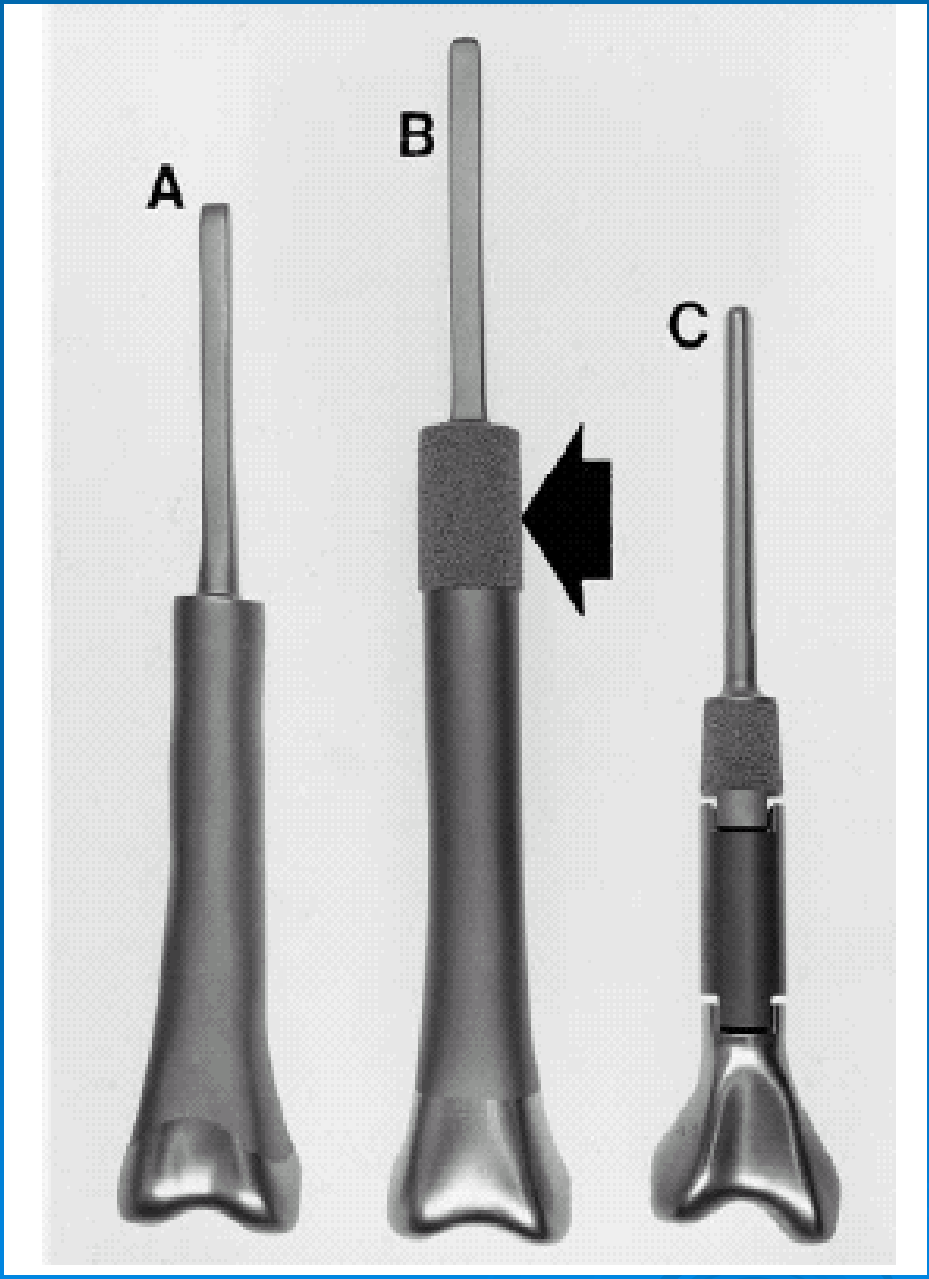
= Neoadjuvant Chemo/R

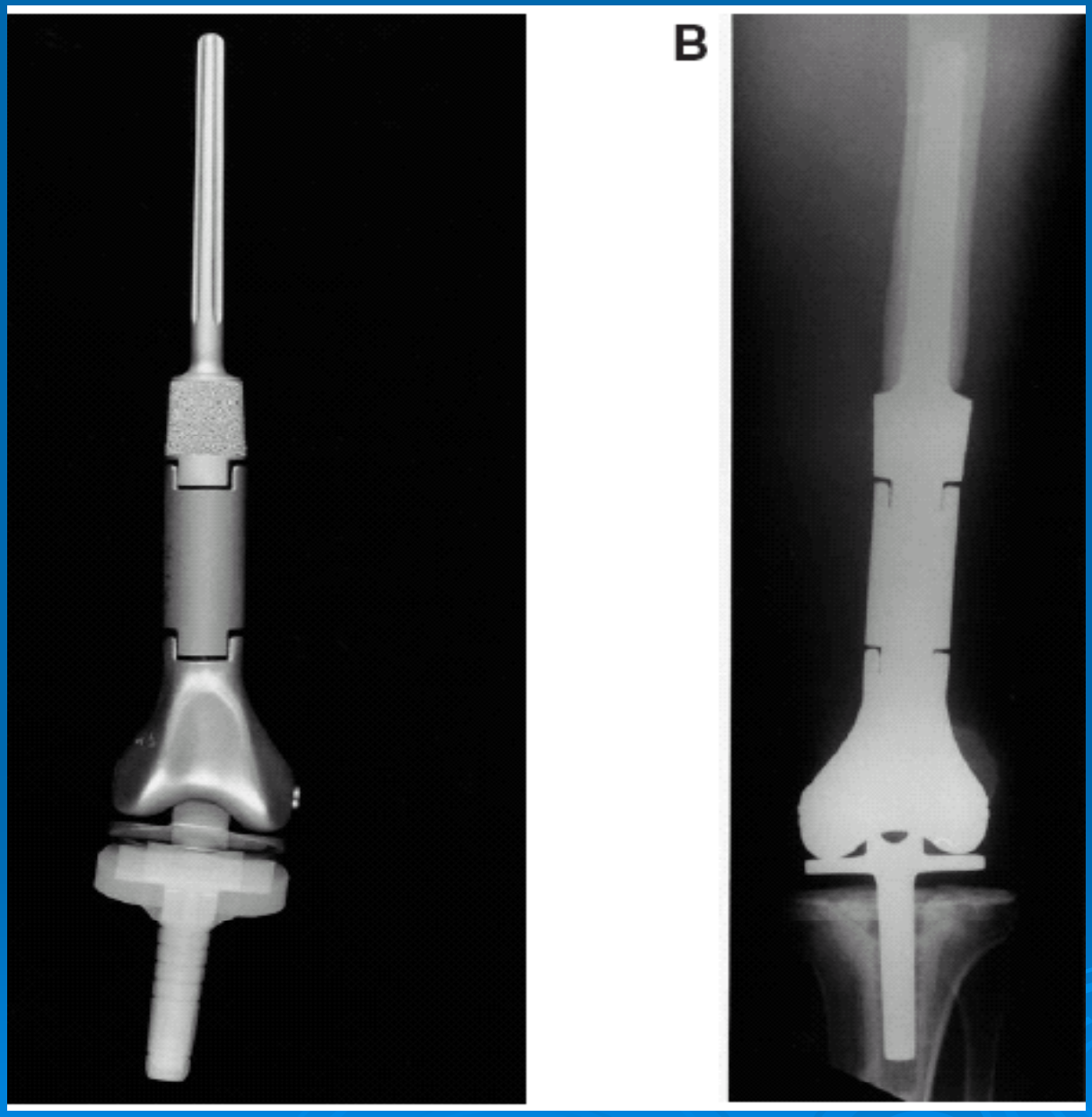
= Radio/R

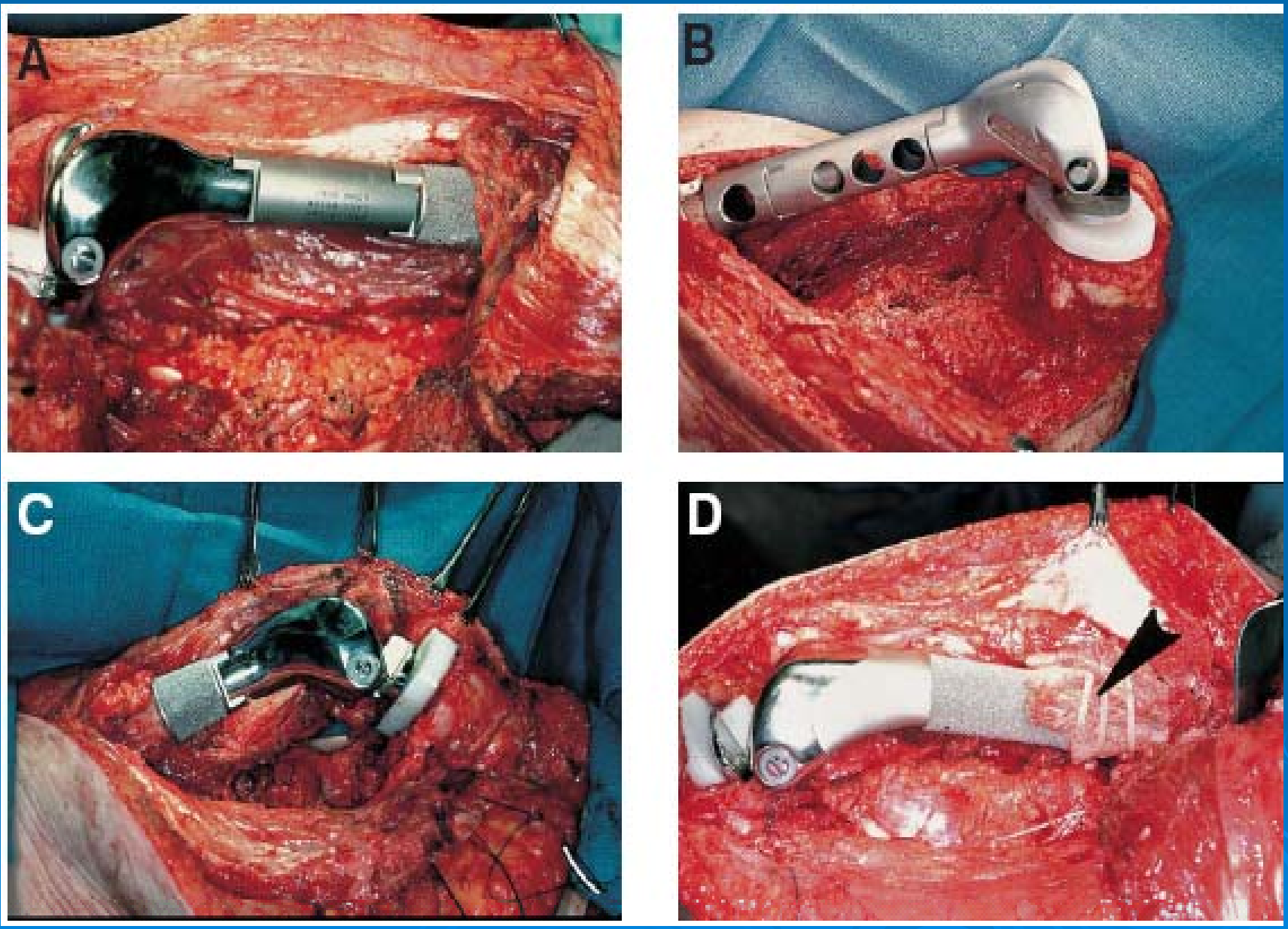
= limb salvage surgery

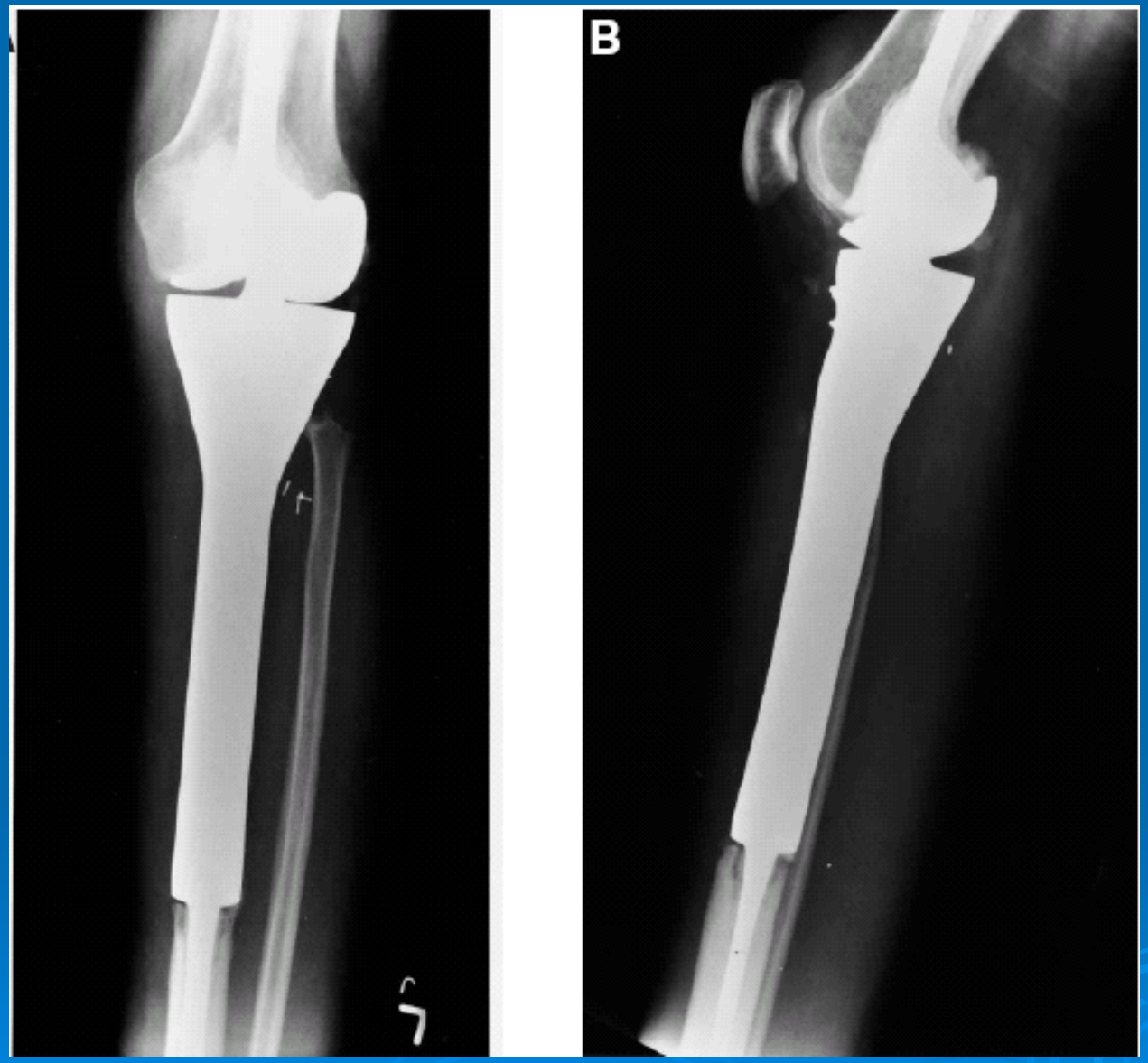
= Amputation

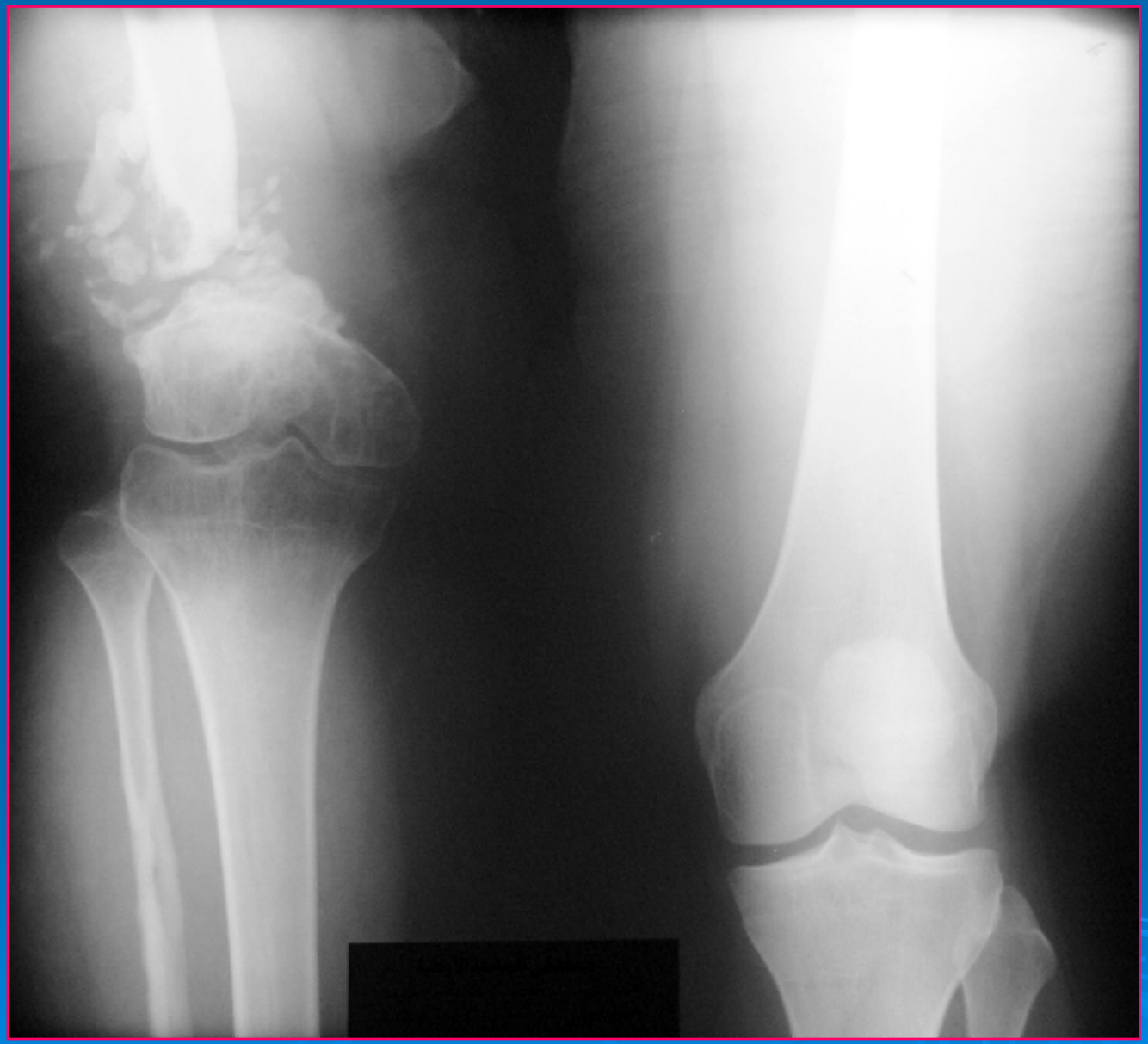
1-Endoprosthesis
2-Distraction osteogenesis
3-Vascularized graft
4-Massive Allograft
5-Resection shortening
6-Rotationplasty

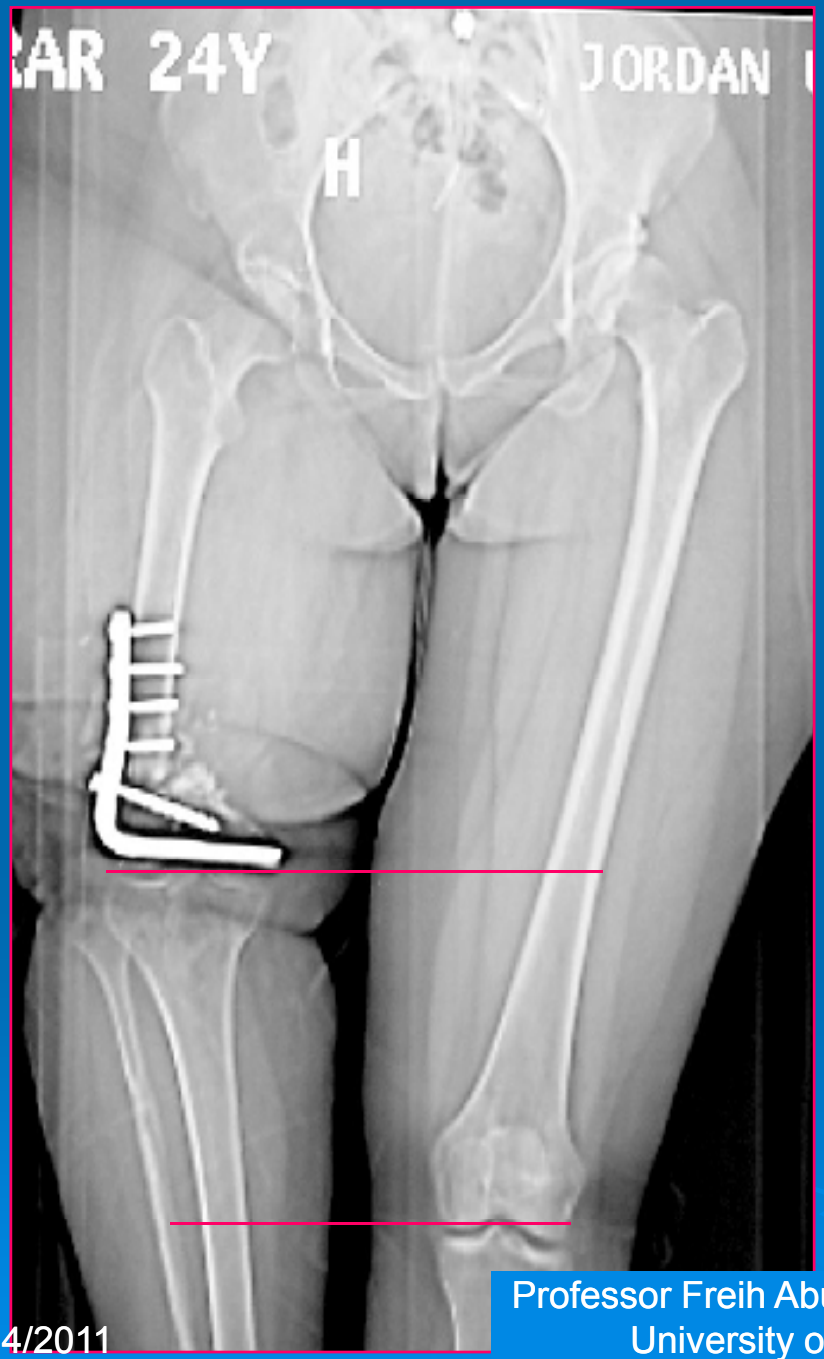

A
B
C

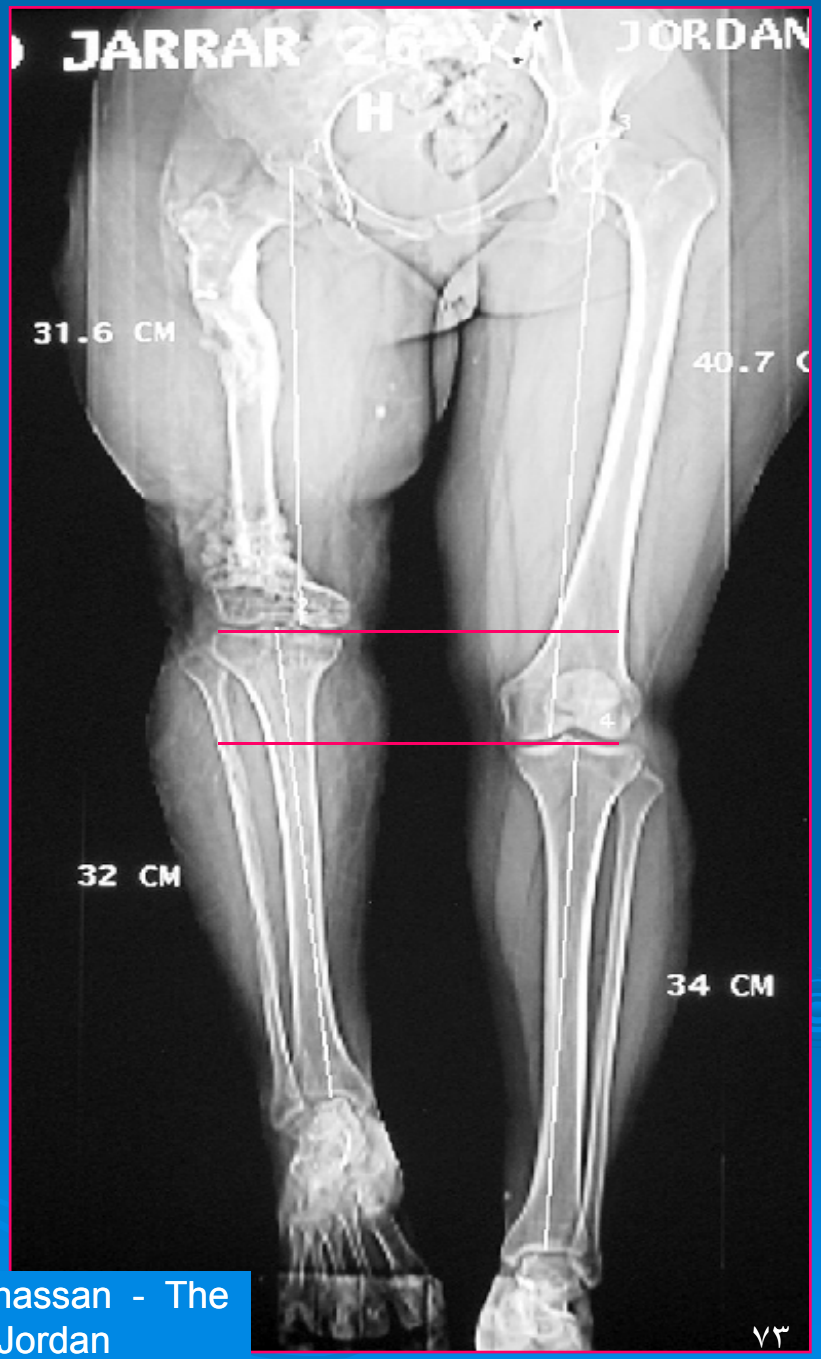

B

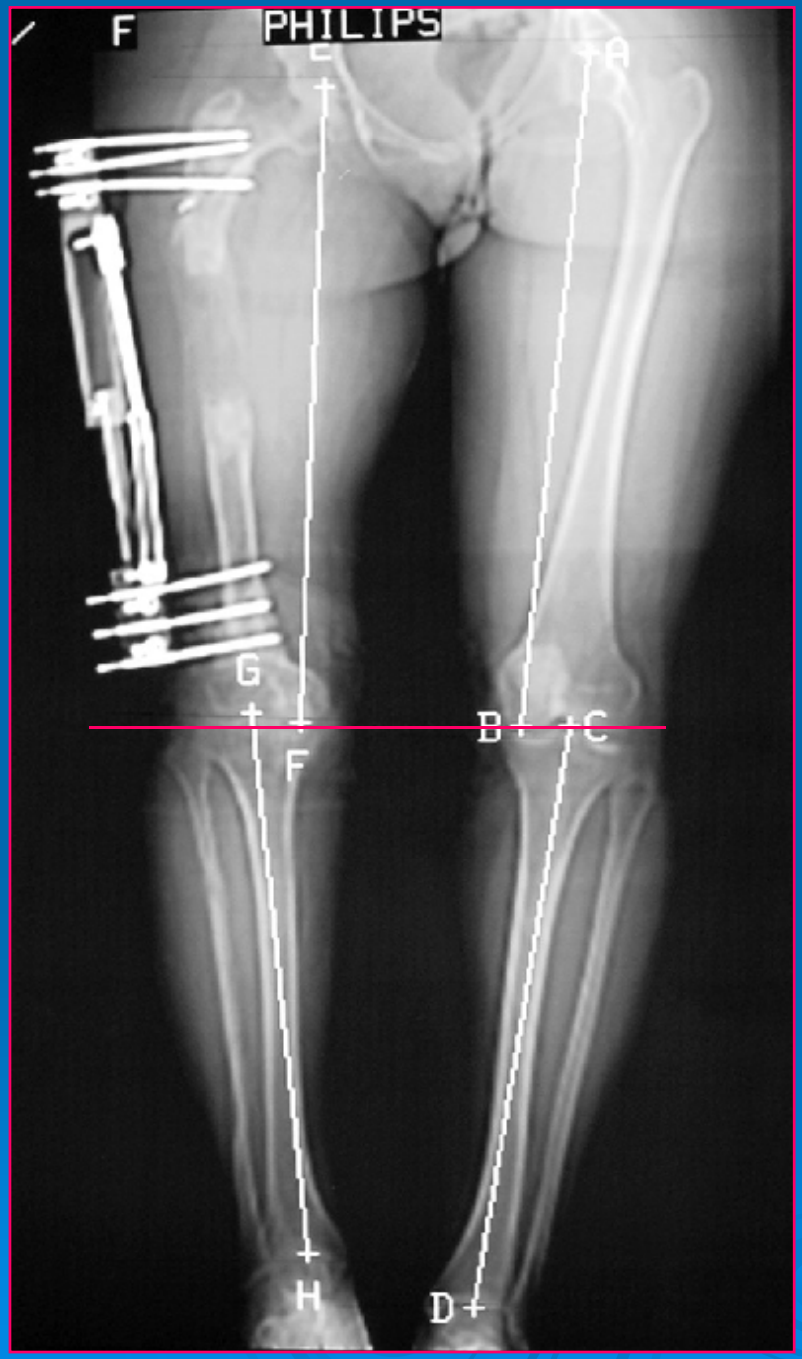

A
B
C
D


B




AR 24Y
JORDAN
H


JARRAR
JORDAN
H
31.6 CM
40.7
32 CM
34 CM


F
PHILIPS
A
G
B
C
F
H
D