BONES & JOINTS
INFECTION

BONE TUMOURS

IMPORTANT …SERIOUS CONSEQUENCE

PLEASE…DON’T MISS!!

EARLY DIAGNOSIS & PROPER TREATMENT

HOW??

- AWARE of THEIR EXISTENCE (Knowledge)
- PREPARE for THEIR OCCURRENCE

- A HIGH INDEX of SUSPICION!!

- PLEASE EXAMINE THE PATIENTS!!

- DON’T JUST LOOK AT X-RAYS AFTER TAKING HISTORY

WHEN IN DOUBT

INVESTIGATIONS

BLOOD TESTS

- CBC; ESR; C-reactive protein; Blood culture

tumour markers; Ca+PO4

X-RAYS

IMAGING

- ULTRASOUND

CT

MRI

BONE SCAN

CONSULT/
SECOND OPINION

ACUTE INFECTION…consider ASPIRATION

BONE & JOINTS INFECTION

- ACUTE vs CHRONIC
- BONE OSTEOMYELITIS
- JOINTS ARTHRITIS

- SEPTIC or SUPPURATIVE

  (Staph. Aureus; Strept; Haem.Inf)

TUBERCULOUS

Others…fungus;
creptococcus;
Atypical Mycobacteria

BONES & JOINTS INFECTION

ORGANISM VIRULENCE VS HOST RESISTANCE

Steroid
Malignancy
AIDS
DM
Renal failure
Drug addict

BONES & JOINT INFECTION

- ENTRY of Organisms

- DIRECT

. WOUND

. OPEN FRACTURE

. OPERATION…incl.
ASPIRATION &INJECTION

- INDIRECT

. VIA BLOOD

ACUTE OSTEOMYELITIS

- USU. A CHILD
- Adults… decreased immunity
- Organisms…STAPH.AUREUS
  (Strept., gram -ve)
- VIA BLOOD; BONE….METAPHYSIS

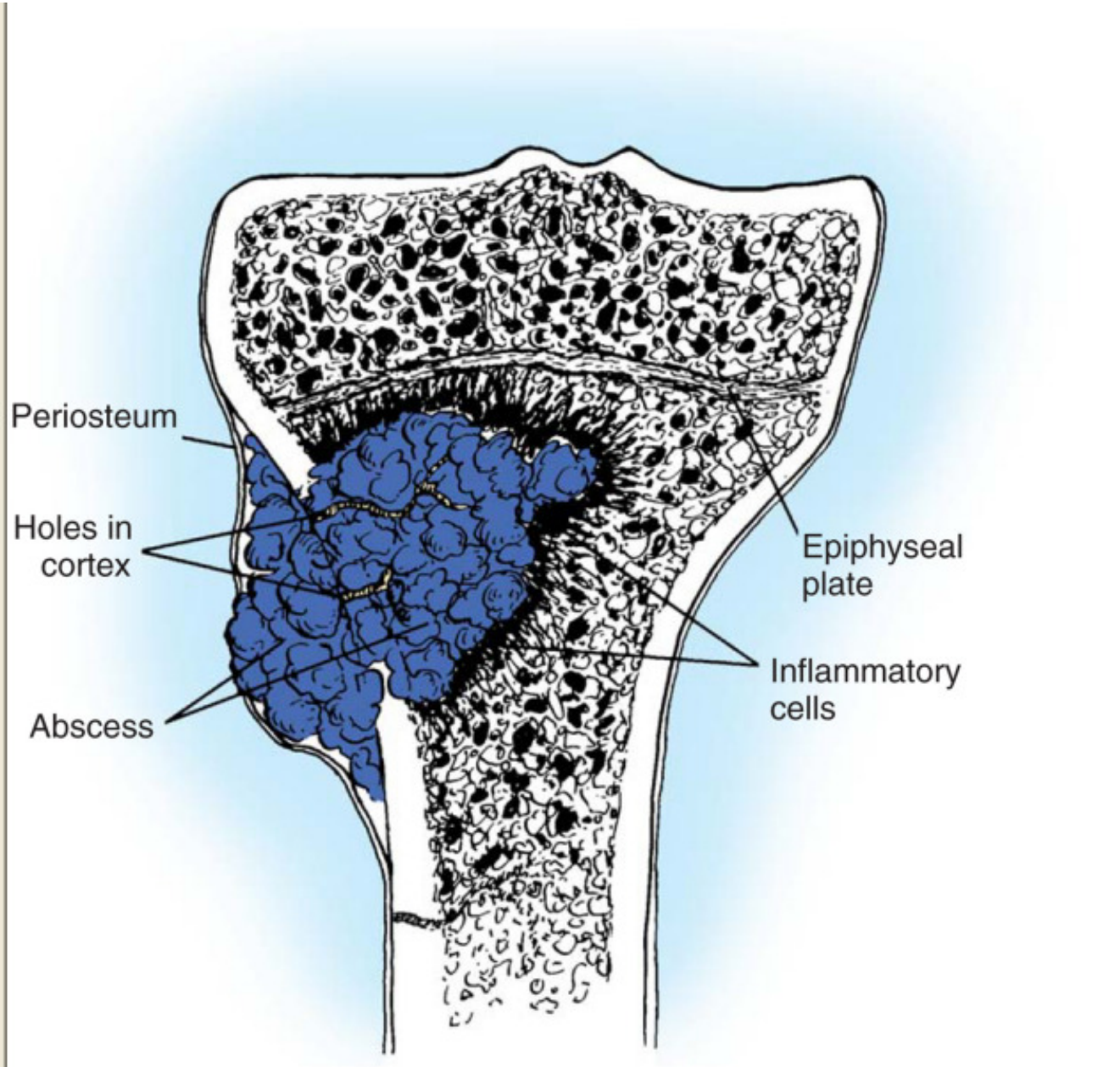


Fig. 16-1 Pathophysiology of hematogenous seeding. When under pressure, exudate or abscess can extend through Volkmar

Acute Osteomyelitis…
CLINICAL FEATURES

- GENERAL… FEVER, MALAISE
- LOCAL…..PAIN, TENDERNESS, WARMTH
  *DECREASED MOVEMENT

BECAREFUL in INFANTS, ELDERLY

CHECK FOR SOURSE of INFECTION

MULTIPLE SITES is POSSIBLE

Acute Osteomyelitis….
INVESTIGATIONS

- X-RAYS…. **NORMAL FIRST 10 DAYS
- USS
- BONE SCAN
- MRI….very sensitive
- BLOOD TESTS…CBC, ESR, C-REACTIVE PROTEIN

- ASPIRATE…from Metaphyseal region or adjacent joint

*sent for smear, Gram stain, culture/st

Acute Osteomyelitis
TREATMENT

- START EARLY!!! TAKE SPECIMENS

  Don’t wait bacteriological confirmation

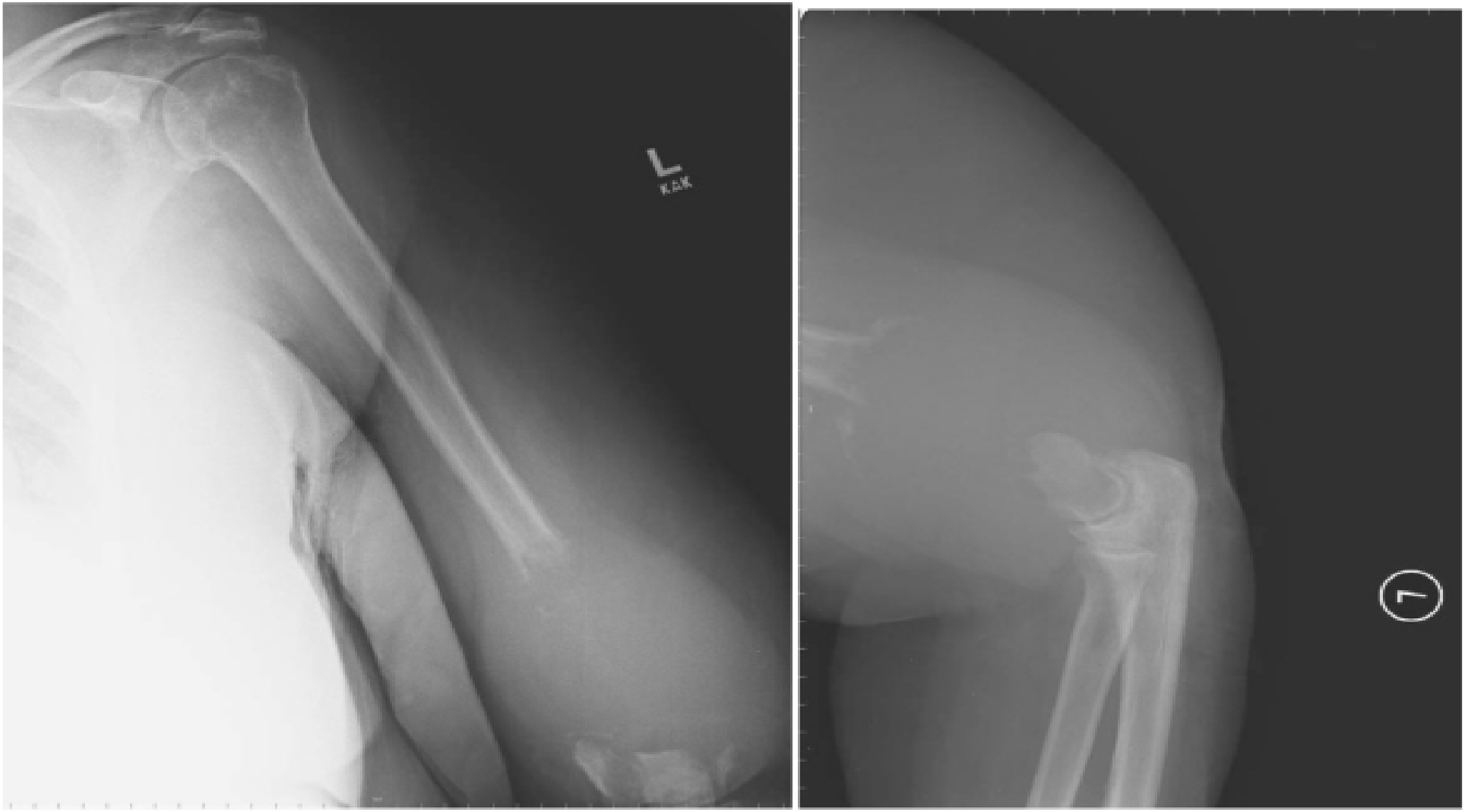
- 4 IMPORTANT PRINCIPLES

1. SUPPORTIVE (incl. pain relief)
2. SPLINTAGE
3. ANTIBIOTICS
4. DRAINAGE by OPERATION

   .pus aspirated/no clinical response

Acute Osteomyelitis
COMPLICATIONS

- SEPTICAEMIA
- METASTATIC INFECTIONS (Other sites)
- ARTHRITIS
- ALTERED BONE GROWTH
- Bone destruction…Path.#
- CHRONIC OSTEOMYELITIS



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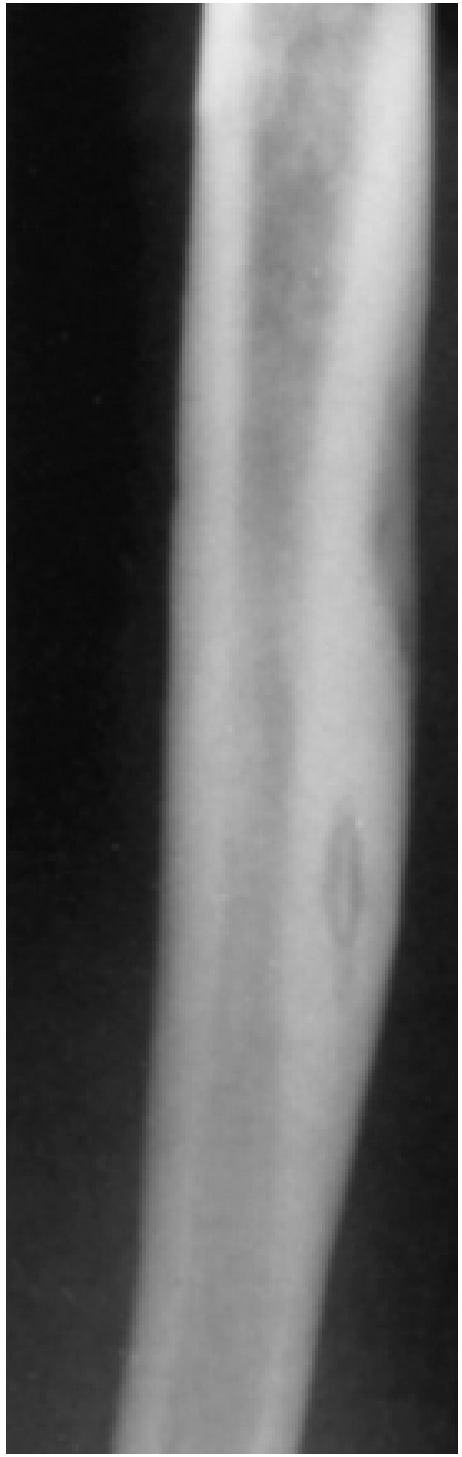
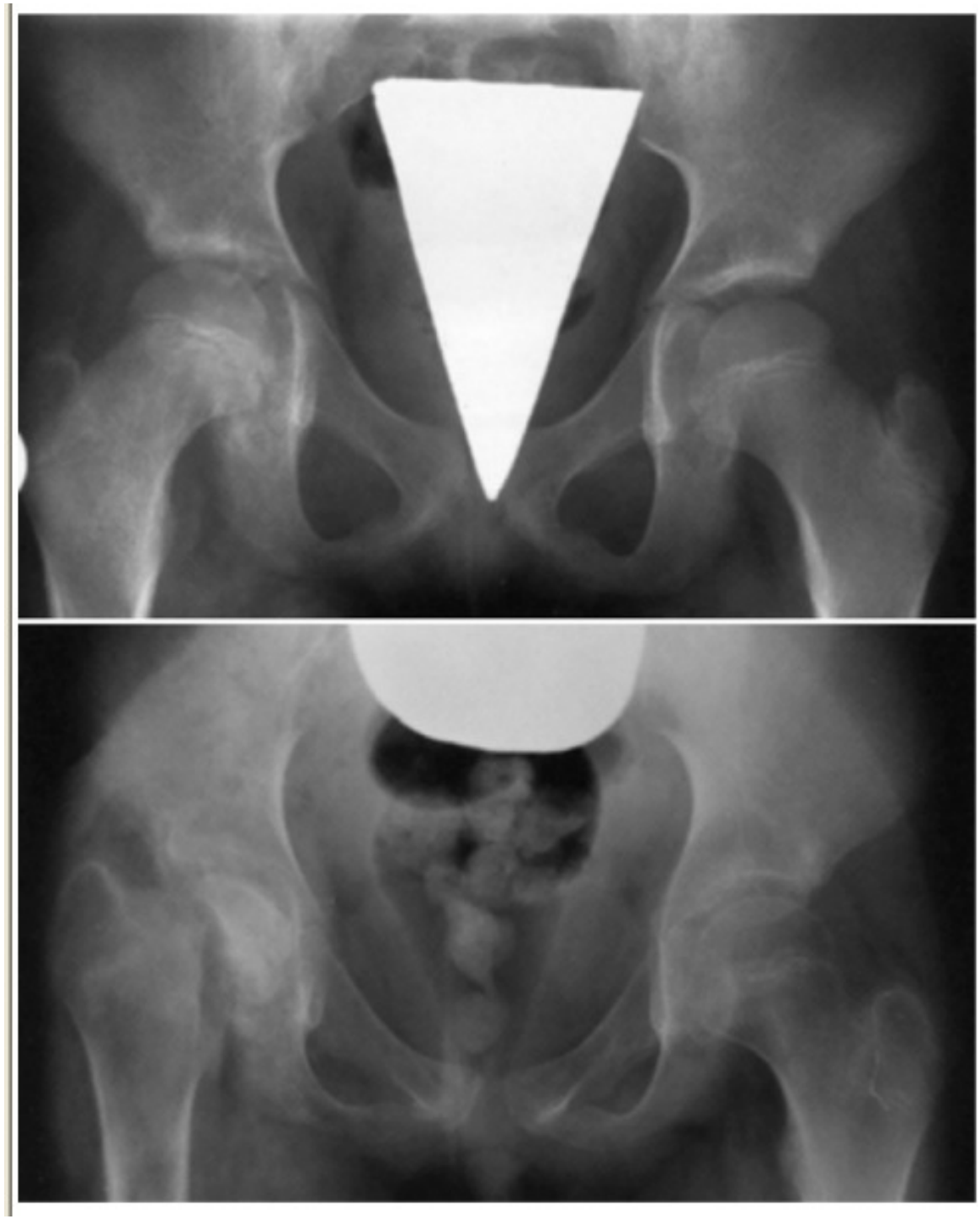




ACUTE SEPTIC ARTHRITIS

- HOW TO REACH JOINTS

- BLOOD
- DIRECT…Wound, injection, operation
- Spread from Ostomyelits

ACUTE SEPTIC ARTHRITIS PATHOLOGY

Bacteria from blood

Synovitis…effusion

Exudate & Pus

Damage to CARTILAGE… partial/complete

Bone destructuction

Acute Septic Arthritis
CLINICAL FEATURES

- INFANTS — Irritable, refuse to feed, rapid pulse
  So…examine
- CHILDREN
  Fever, pain, * reluctance to move/walk
  Superficail Joint….warmth, swelling
  decreased motion
- ADULTS — Fever, pain …..

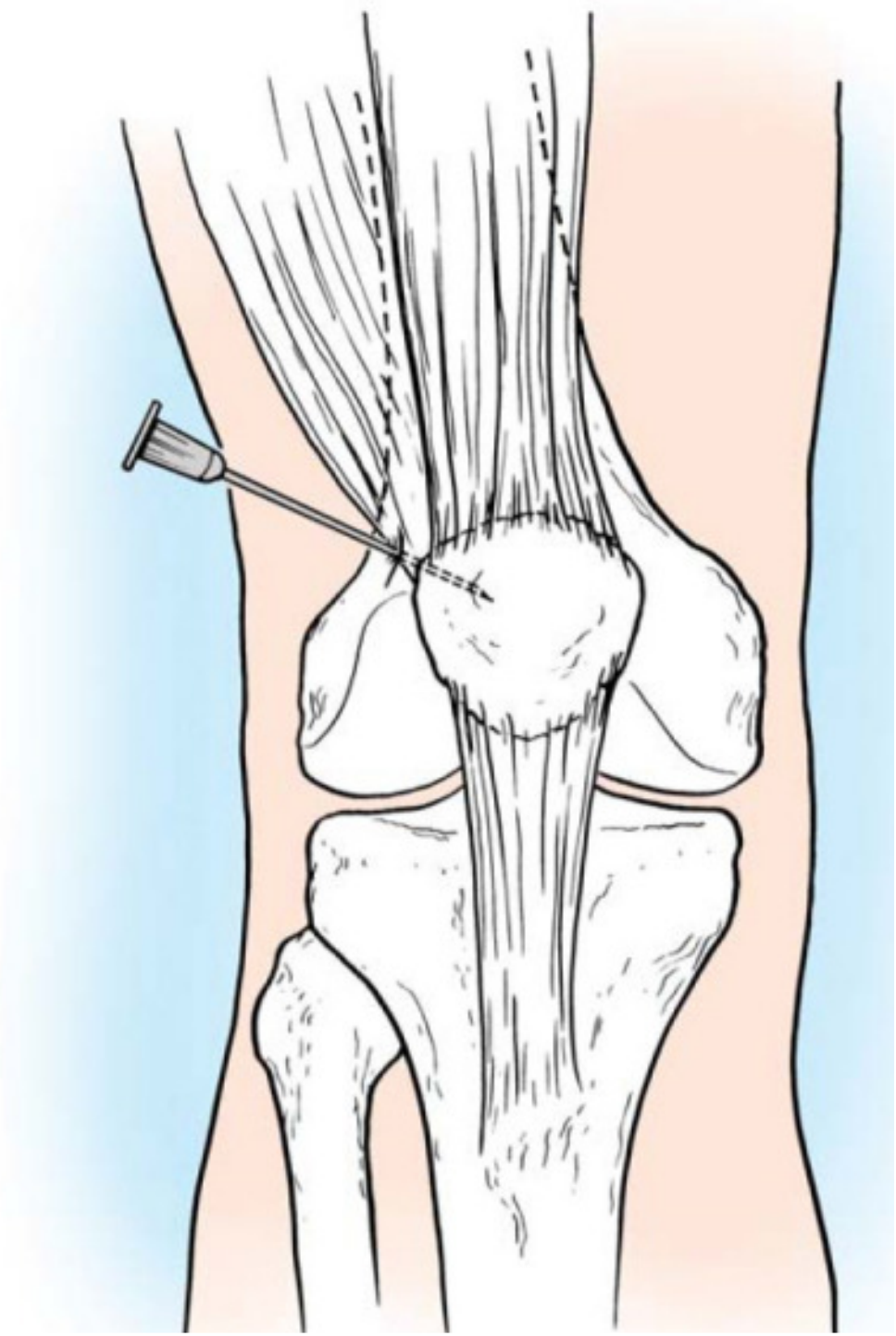
  Beware of ‘silent’ joint infection eg steroids

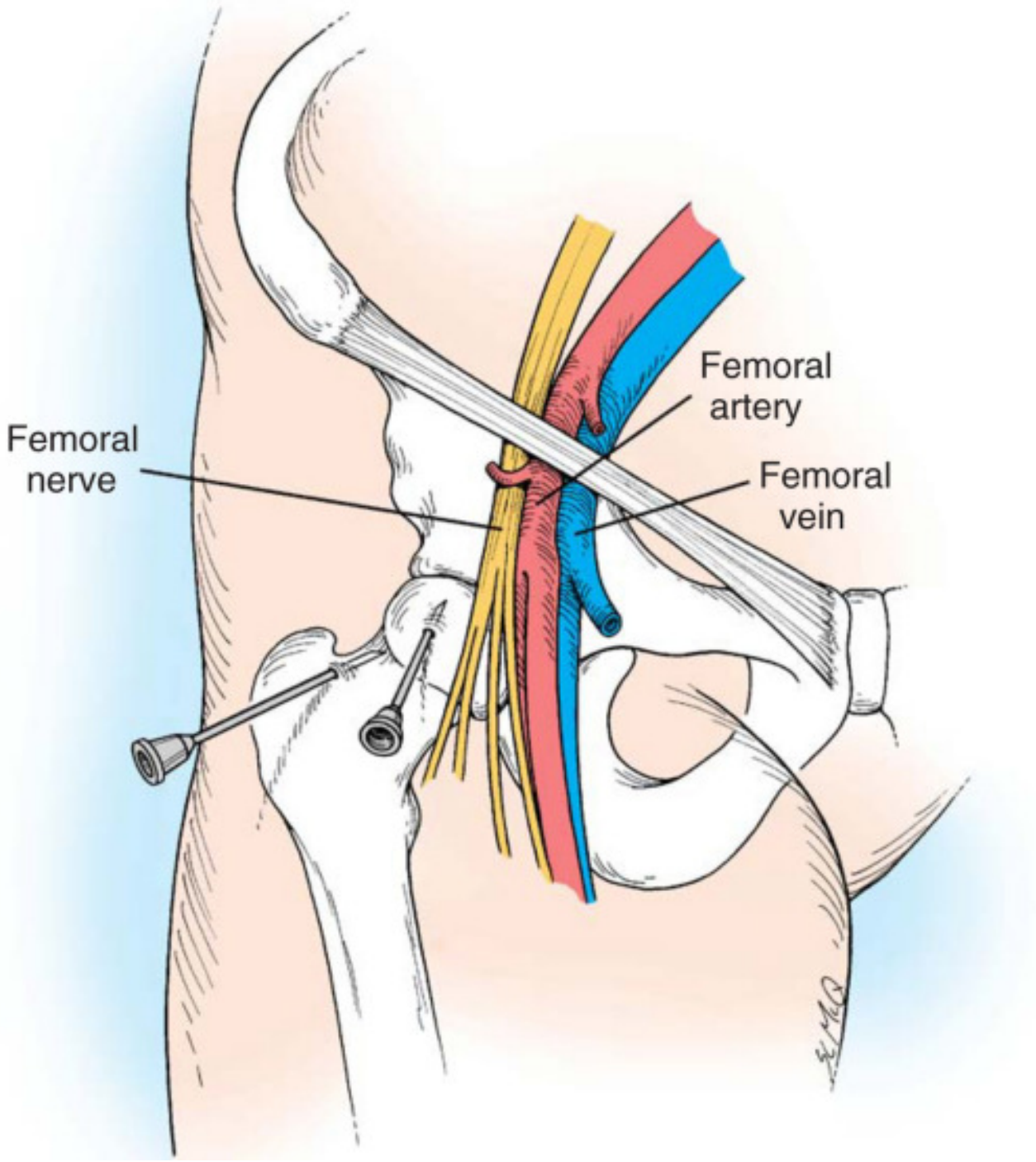
Acute Septic Arthritis
INVESTIGATIONS

- BLOOD TESTS…CBC, ESR, C-reactive protein

  blood culture
- X-rays…. *early…NORMAL

  late….decreased joint space
- USS…..showing effusion
- ASPIRATION… simple & diagnostic!




Femoral artery
Femoral nerve
Femoral vein

Acute Septic Arthritis
TREATMENT

- Early!! To avoid damage to the joint!

- 4 BASIC PRINCIPLES

1. Supportive
2. Splintage……REST with traction or splint
3. Antibiotic……effective and enough
4. DRAINAGE!!

DRAINAGE

- OPEN DRAINAGE

.HIP

.PUS ASPIRATED

.NO CLINICAL RESPONSE

- KNEE….ARTHROSCOPY

- REPEATED ASPRIRATION

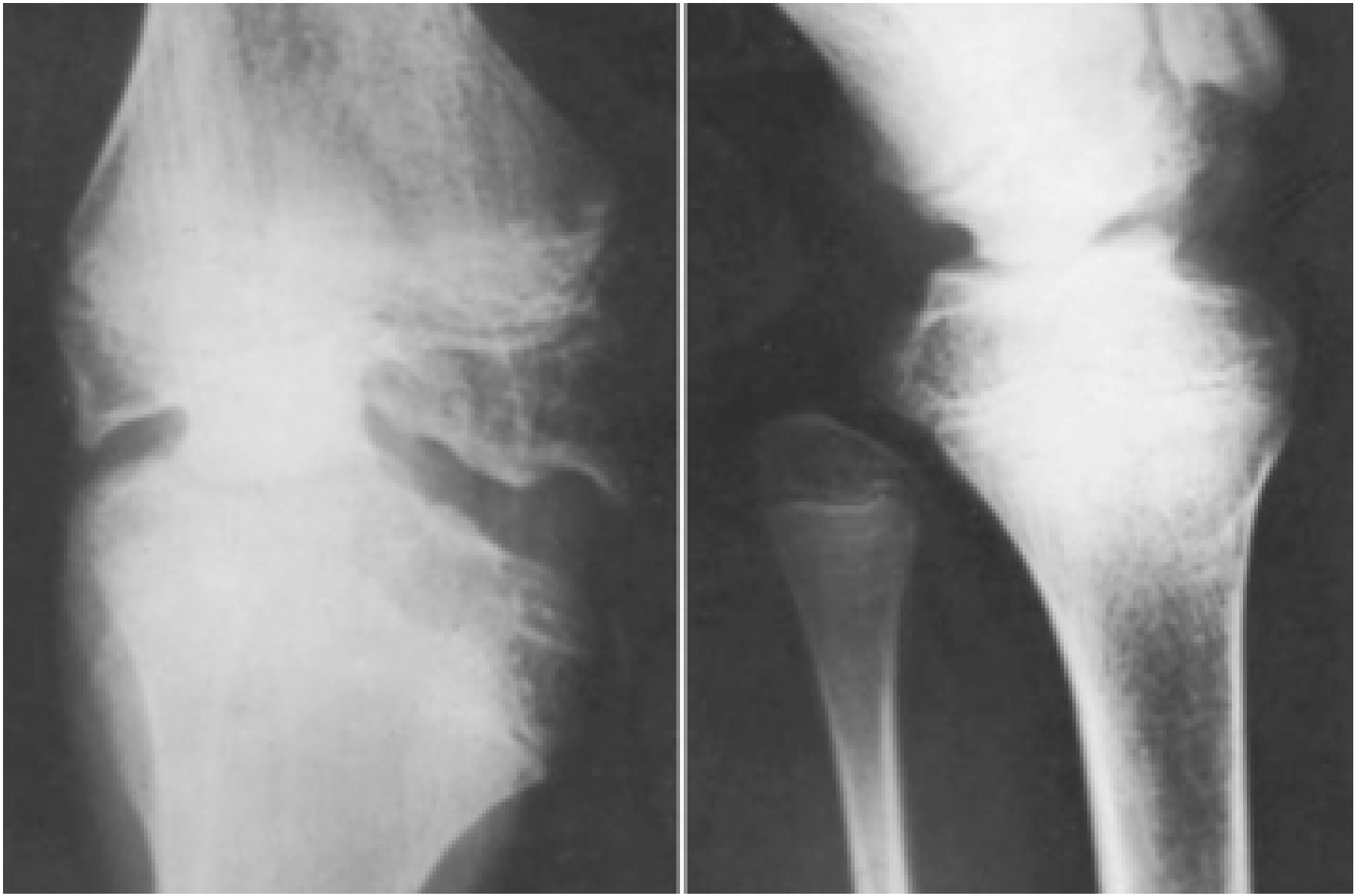
..for older children

..early arthritis

..superficial joints

Acute Septic Arthritis
COMPLICATIONS

- CARTILAGE DAMAGE
  - early OA/ankylosis
- BONE DESTRUCTION
  - Pathological Fracture
  - Hip…dislocation
- GROWTH DISTURBANCE



TUMOURS

- SOFT TISSUE TUMOURS

*BENIGN

*MALIGNANT

For MALIGNANT

>PRIMARY

>SECONDARY(METASTATIC)

- BONE TUMOURS

*BENIGN

*MALIGNANT

SOFT TISSUE TUMOURS

CELL TYPE	BENIGN	MALIGNANT
Fat cell	LIPOMA	LIPOSARCOMA
Fibrous tissue	FIBROMA	FIBROSARCOMA
Synovial tissue	Pigmented villonular synovitis, GCT	Synovial Sarcoma
Blood vessels	Haemangioma	
Nerve	neurolemmoma neurofibroma	NeuroSarcoma
Muscles	Rhabdomyoma	Rhabdomyosarcoma

BONE TUMOURS

CELL TYPE	BENIGN	MALIGNANT
Bone	Osteoid osteoma	Osteosarcoma
Cartilage	Chondroma	Chondrosarcoma
	Osteochondroma	
Fibrous tissue	Fibroma	Fibrosarcoma
Marrow	Haemangioma	Angiosarcoma
		Myeloma

*METASTASIS

A SUSPECTED BONE TUMOUR

? Is it a tumour (DDx: infection;stress #)

? Is it BENIGN or MALIGNANT

? If it is malignant, is it PRIMARY or SECONDARY

? What type

Bone Tumours
CLINICAL FEATURES

History:

.Asymptomatic

.Pain

.Swelling

.Pathological fracture

Physical Examination:

Local

*GENERAL…?nerve/blood vessel involvement

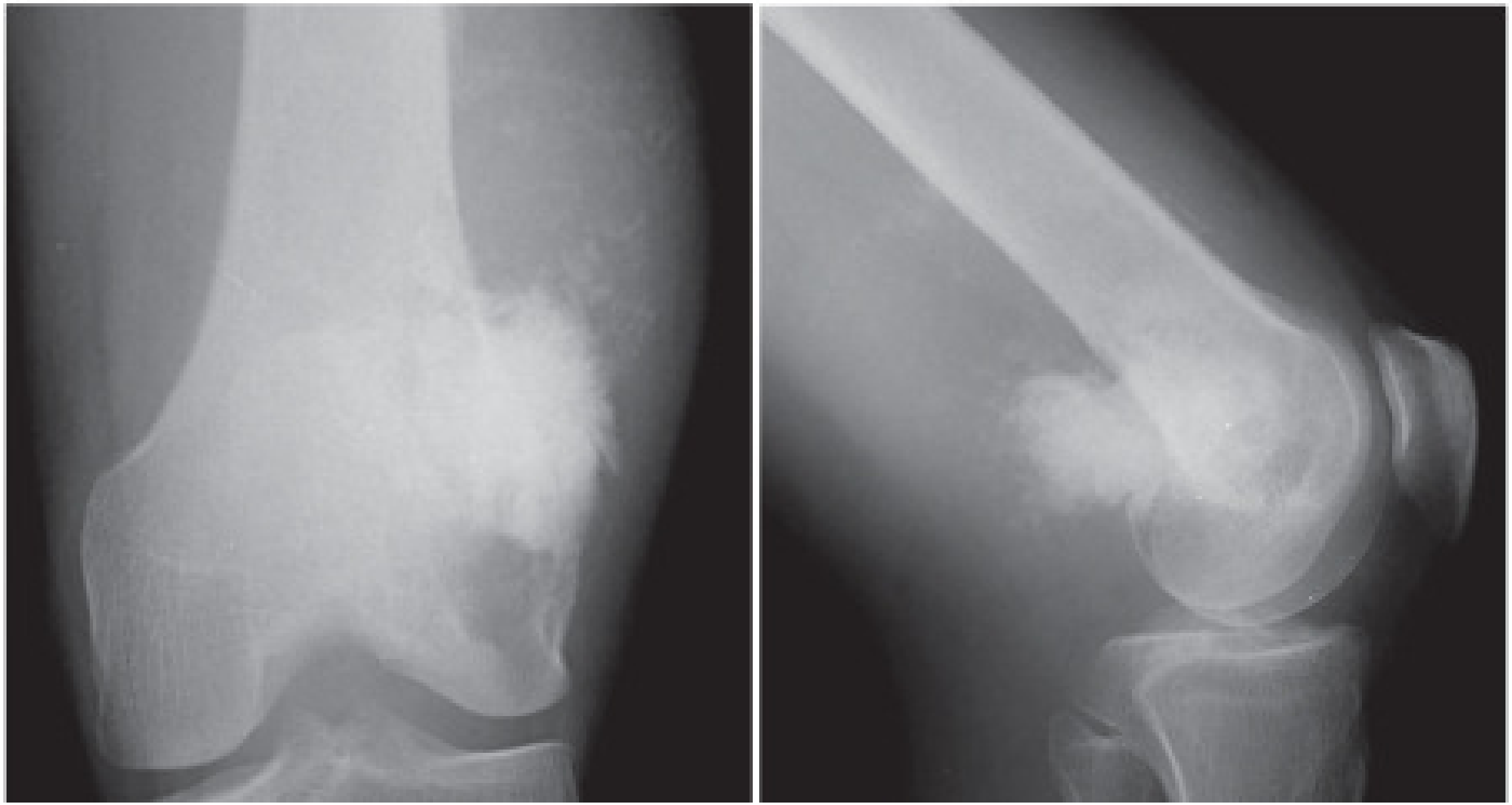
?spread

? Primary cancer

Bone Tumours
INVESTIGATIONS

Blood tests

X-RAYS .. Single or multiple
- which bone
- which part
- margin of the lesion ?well defined
- ?cortical destruction
- ?periosteal reaction
- ?calcification



- CT scan
- MRI scan..

  assess Tumour Spread >within Bone

  >into SOFT TISSUE

  >into Joint

  * important for STAGING/TREATMENT PLAN

PET scan

?distant metastasis

?primary

Bone Tumour
BIOPSY

Essential for definitive diagnosis

Done after imaging

Large bore Needle / Open Biopsy

NOT a minor procedure

Better leave to specialists

TREATMENT for MALIGNANT BONE TUMOURS

FACTORS

>TYPE of TUMOUR

>GRADING of tumour

>STAGING of tumour

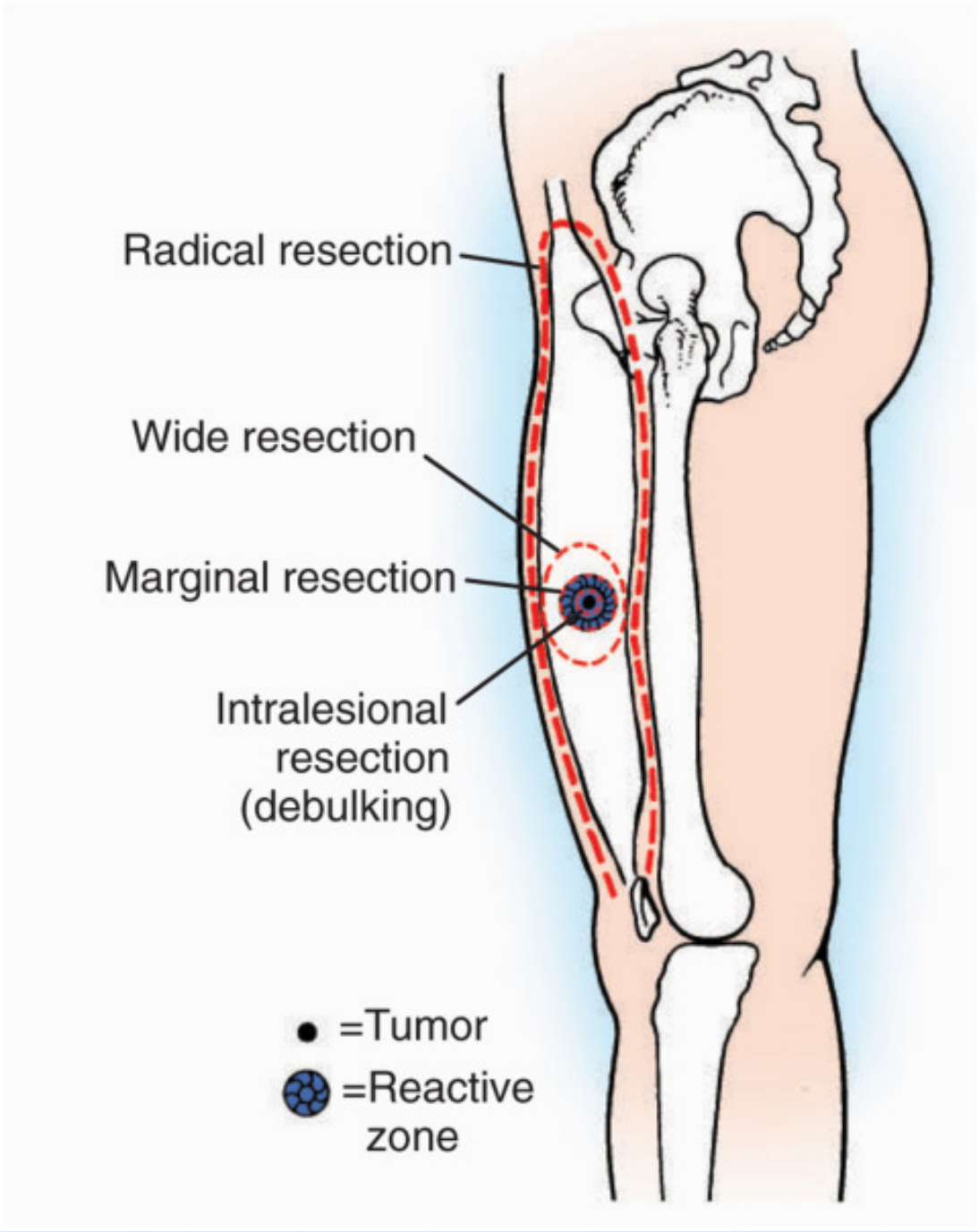
LOCAL: INTRA-COMPARTMENT or
EXTRA-COMPARTMENT

GENERAL

>PATIENT PROFILE

>? EXPERTISE

>? SUPPORTING FACILITIES

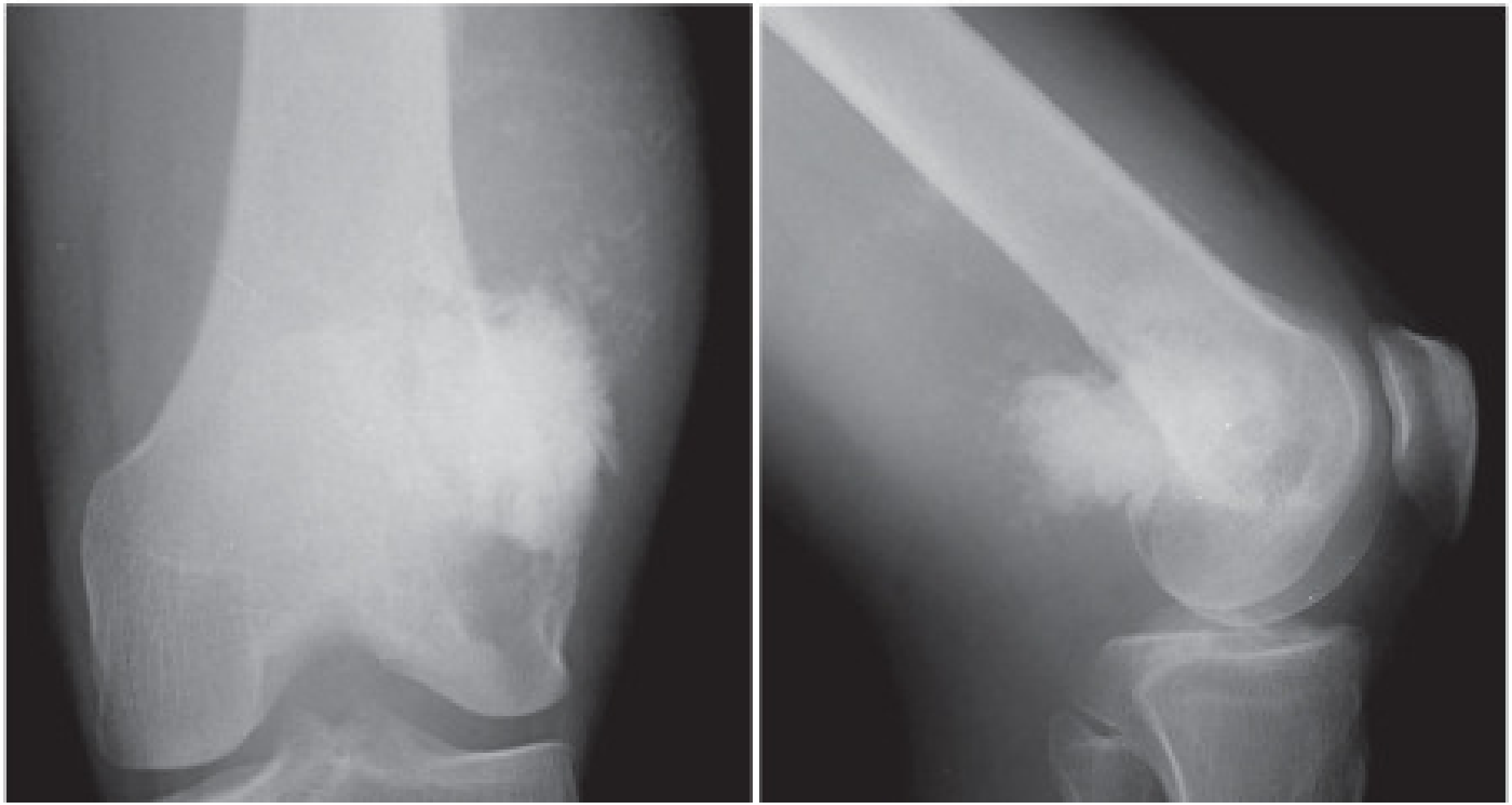

Radical resection
Wide resection
Marginal resection
Intralesional resection (debulking)
=Tumor
=Reactive zone

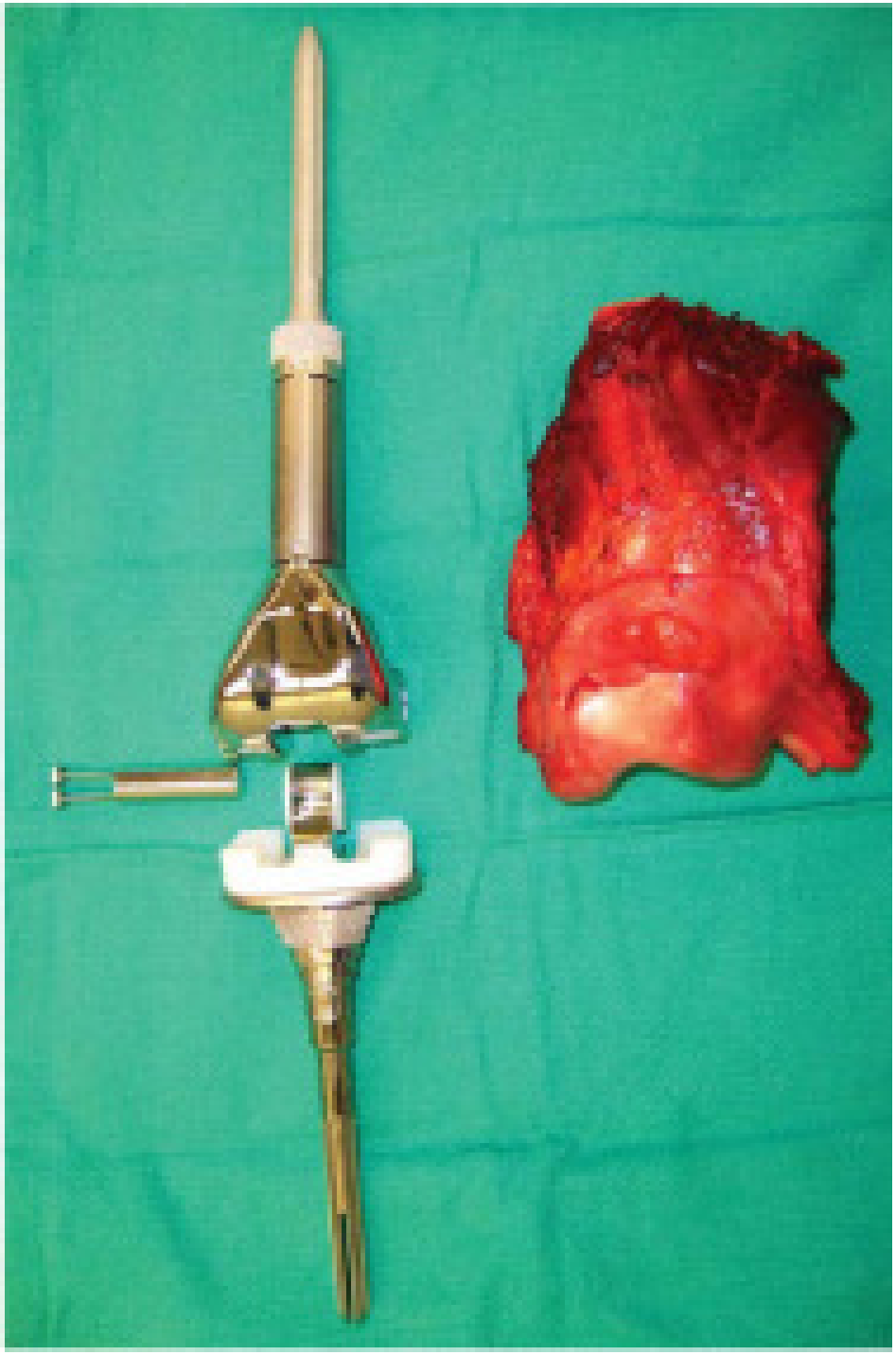
TREATMENT for MALIGNANT BONE TUMOUR

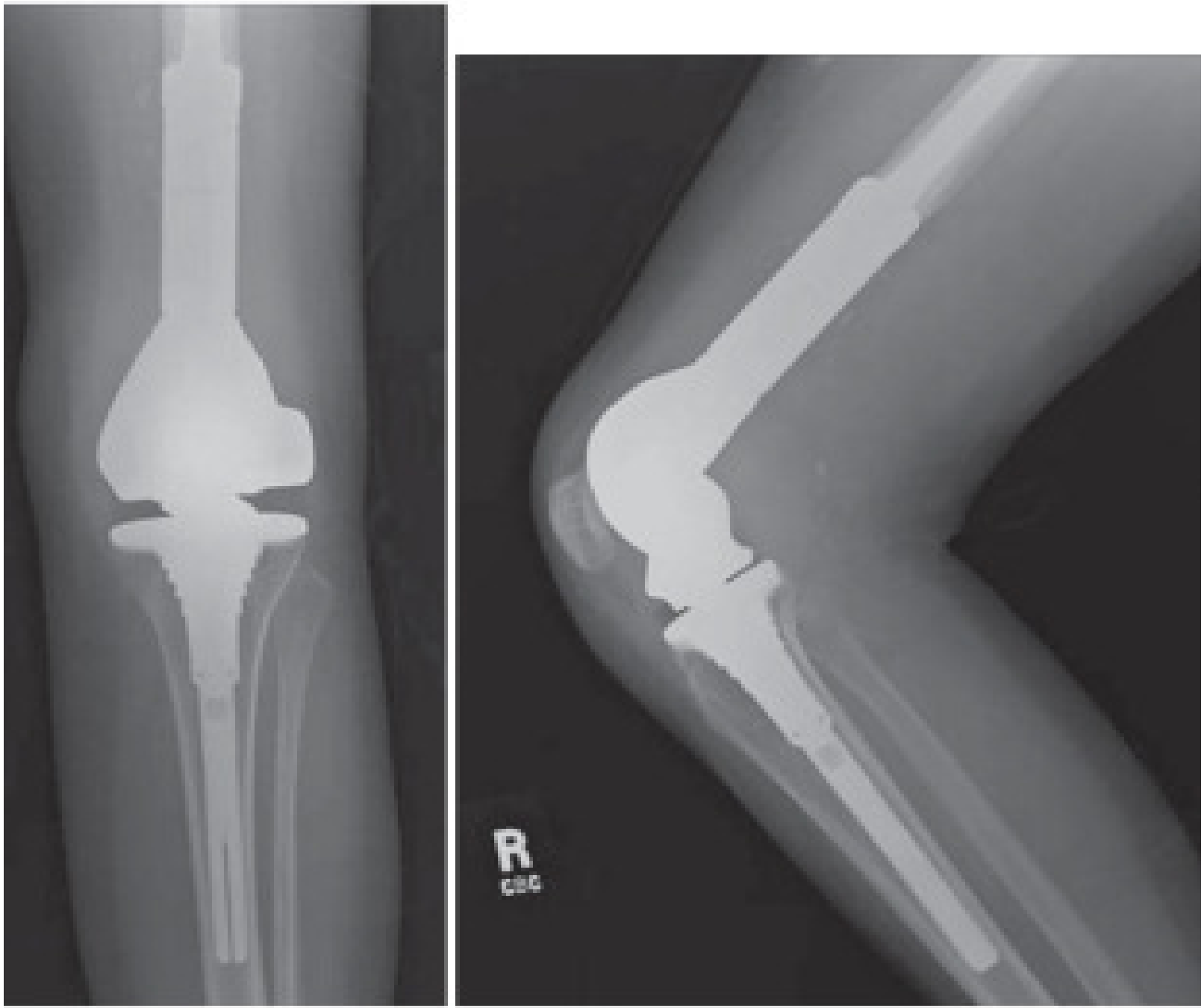
Should be treated in TUMOUR CENTRE
LIFE-SAVING is most important

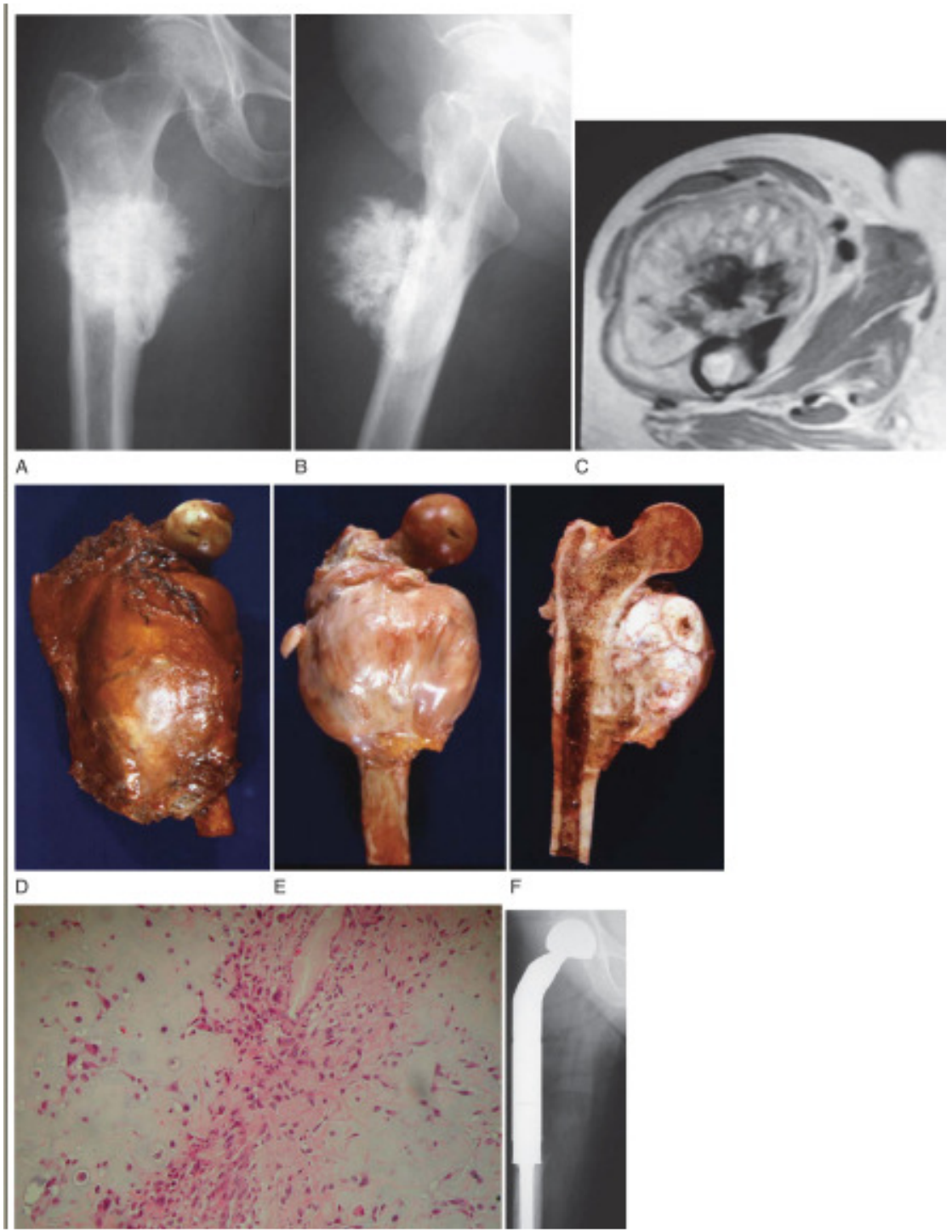
Methods of TREATMENT
1. Surgery….Radical RESECTION or Wide Excision
(complete compartment)
AMPUTATION vs LIMB-SAVING

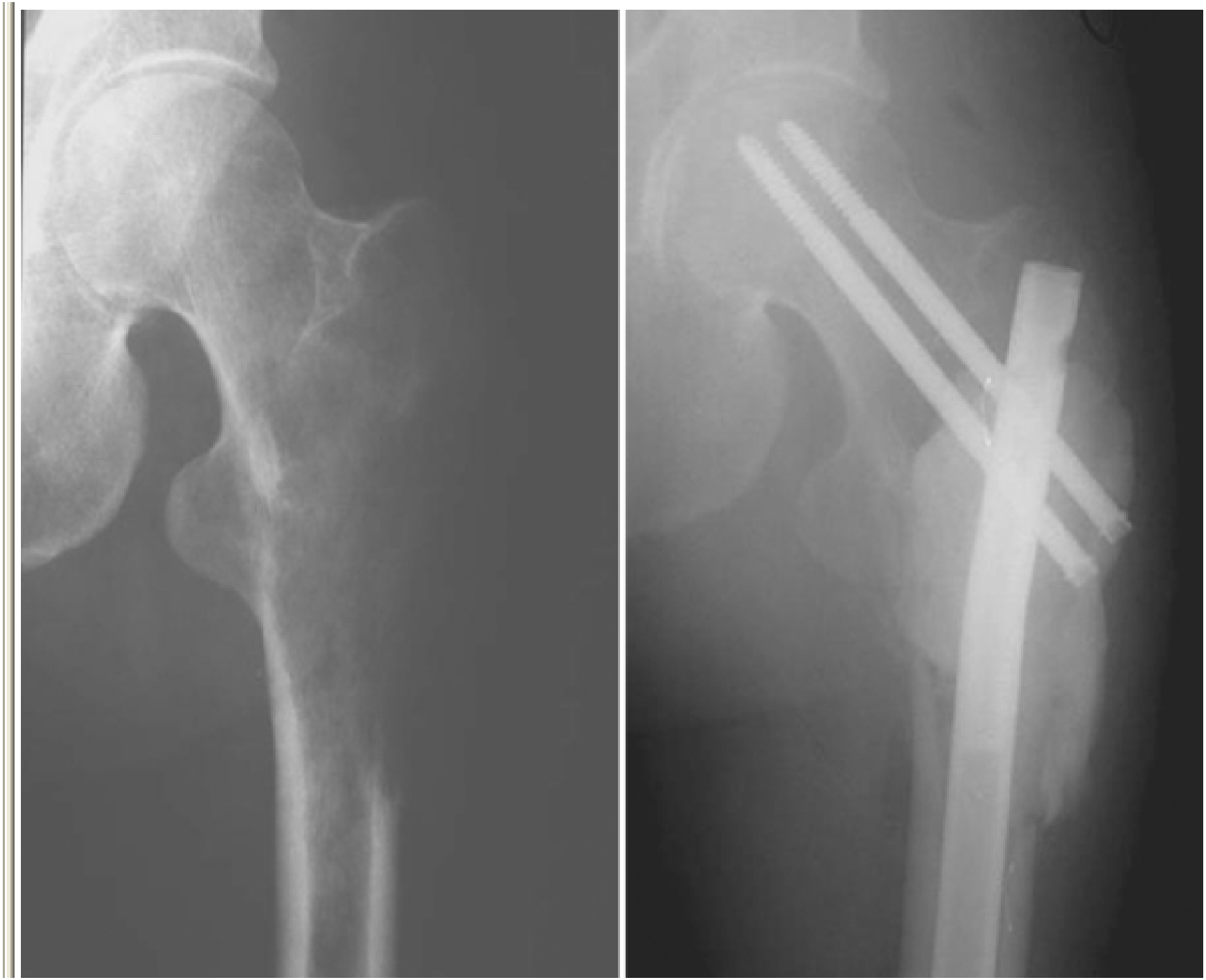
2. CHEMOTHERAPY
3. RT



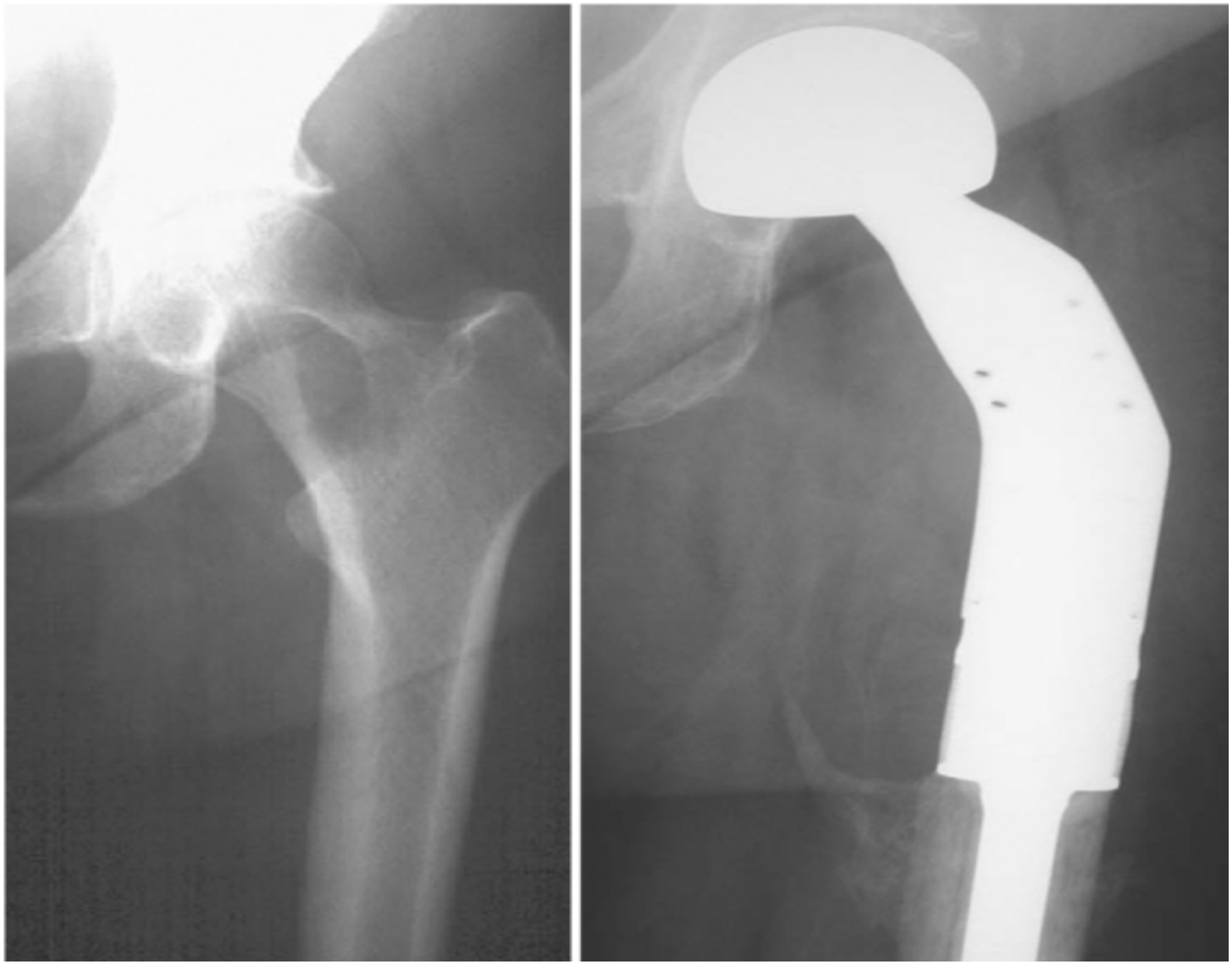



R


A
B
C
D
E
F



METASTAIC TUMOUR



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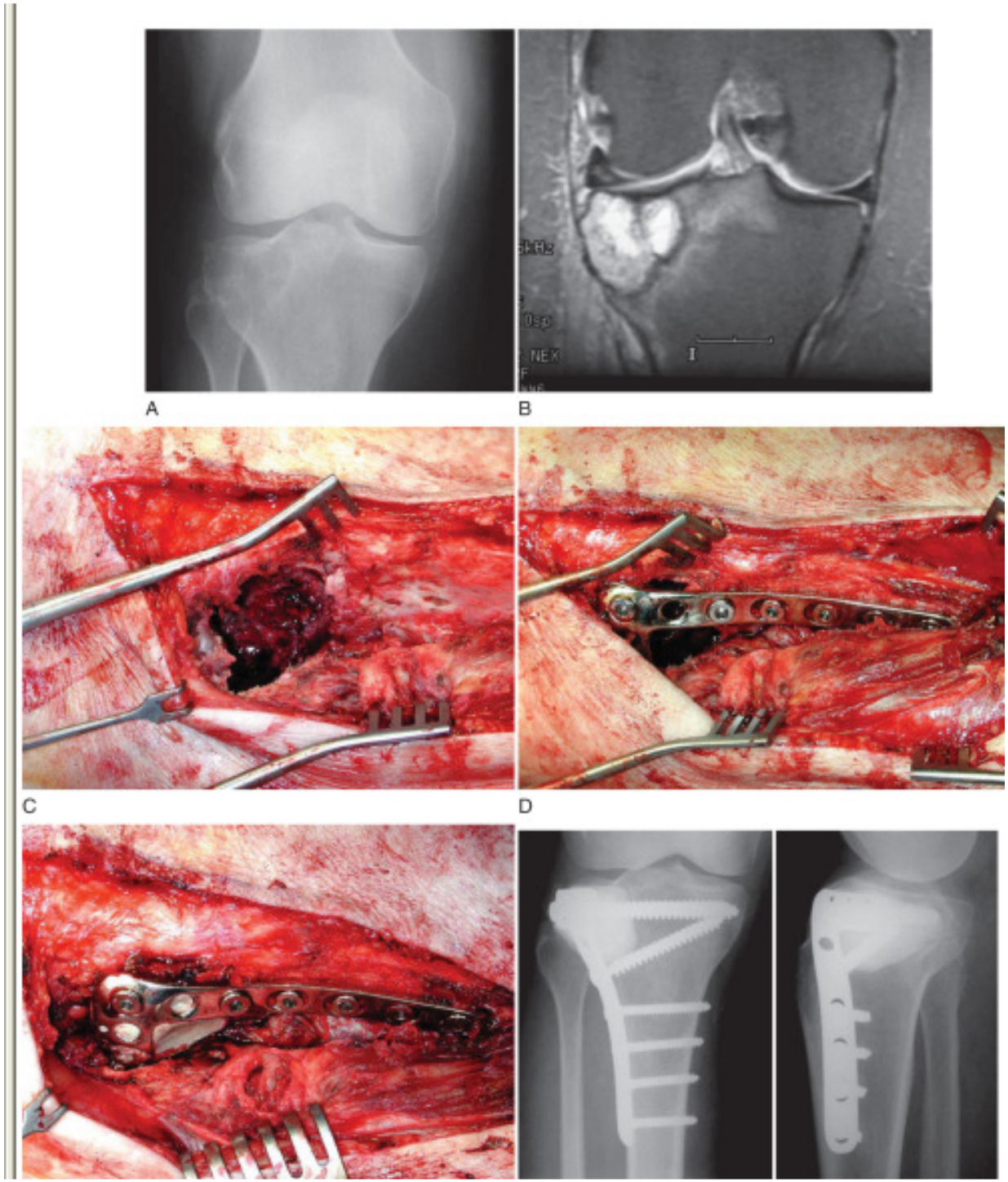
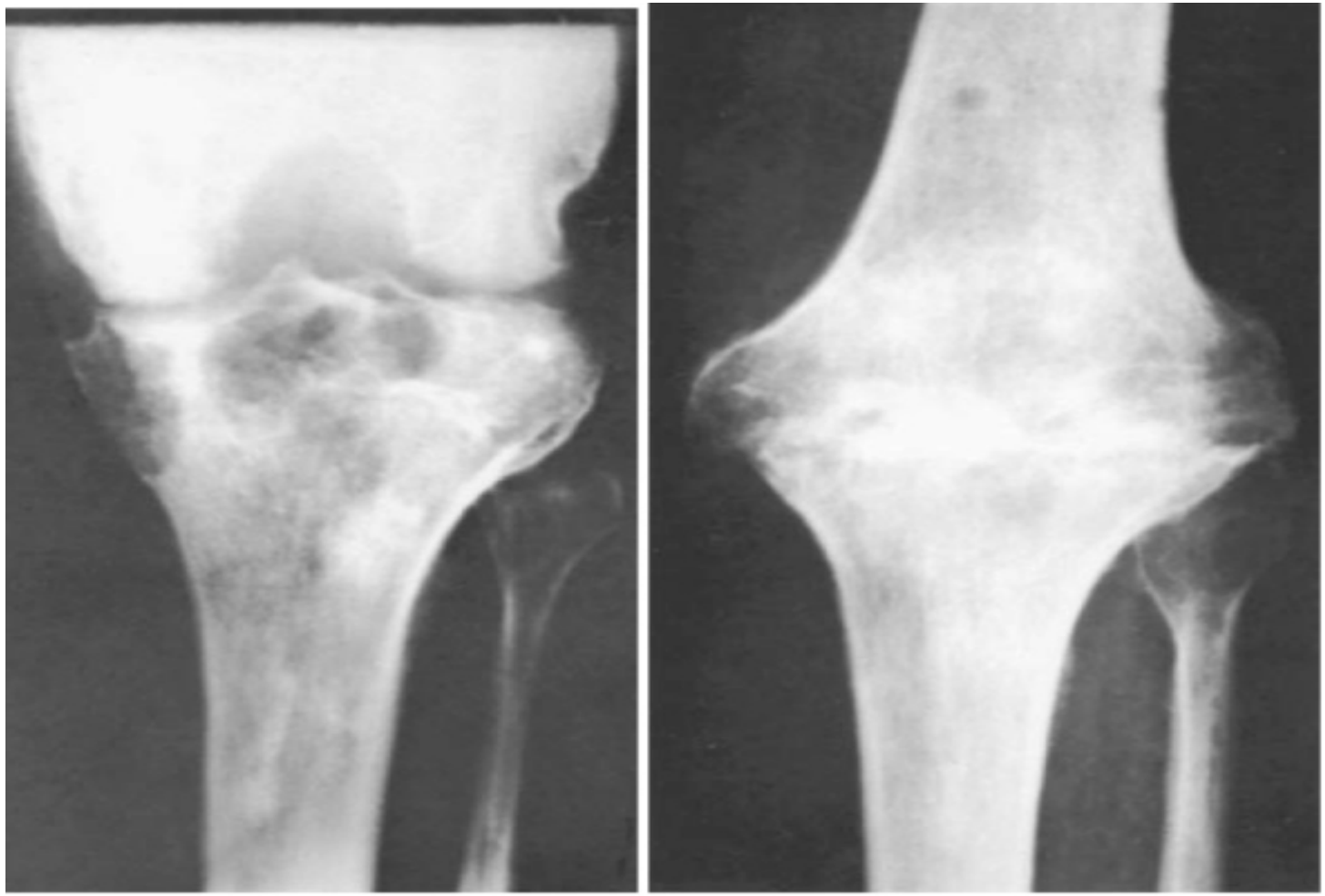

A
B
C
D

TB can still be seen!



CARPAL TUNNEL SYNDROME

- PAIN/PARASTHESIA
- MORNING STIFFNESS
- WEAKNESS

- ?WORK COMPENSATION

Factors Involved in the Pathogenesis of Carpal Tunnel Syndrome

Anatomy

Decrease in Size of Carpal Tunnel

- Bony abnormalities of the carpal bones
- Acromegaly
- Flexion or extension of wrist

Increase in Contents of Canal

- Forearm and wrist fractures (Colles fracture, scaphoid fracture)
- Dislocations and subluxations (scaphoid rotary subluxation, lunate volar dislocation)
- Posttraumatic arthritis (osteophytes)
- Musculotendinous variants
- Aberrant muscles (lumbrical, palmaris longus, palmaris profundus)
- Local tumors (neuroma, lipoma, multiple myeloma, ganglion cysts)
- Persistent medial artery (thrombosed or patent)
- Hypertrophic synovium
- Hematoma (hemophilia, anticoagulation therapy, trauma)

Physiology

Neuropathic Conditions

- Diabetes mellitus
- Alcoholism
- Double-crush syndrome
- Exposure to industrial solvents

Inflammatory Conditions

- Rheumatoid arthritis
- Gout
- Nonspecific tenosynovitis
- Infection

Alterations of Fluid Balance

- Pregnancy
- Menopause
- Eclampsia
- Thyroid disorders (especially hypothyroidism)
- Renal failure
- Long-term hemodialysis
- Raynaud disease
- Obesity
- Lupus erythematosus
- Scleroderma
- Amyloidosis
- Paget disease

External Forces

- Vibration
- Direct pressure

CARPAL TUNNEL SYNDROME

- CLINICAL TESTS

1.PHALEN'S TEST (WRIST FLEXION)

2.NERVE PERCUSSION TEST

3.PRESSURE TEST

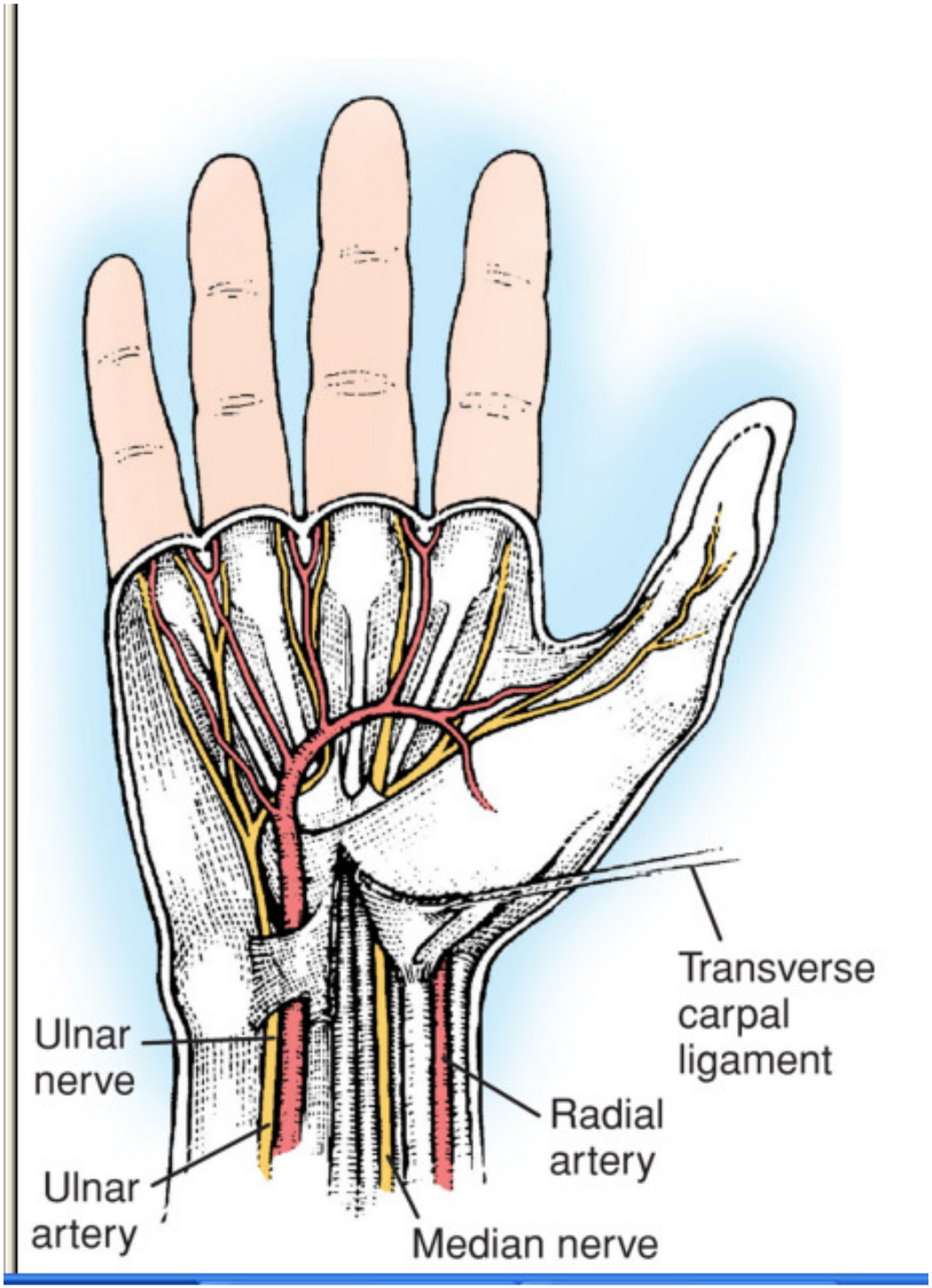
CHECK FOR THENAR WEAKNESS/WASTING

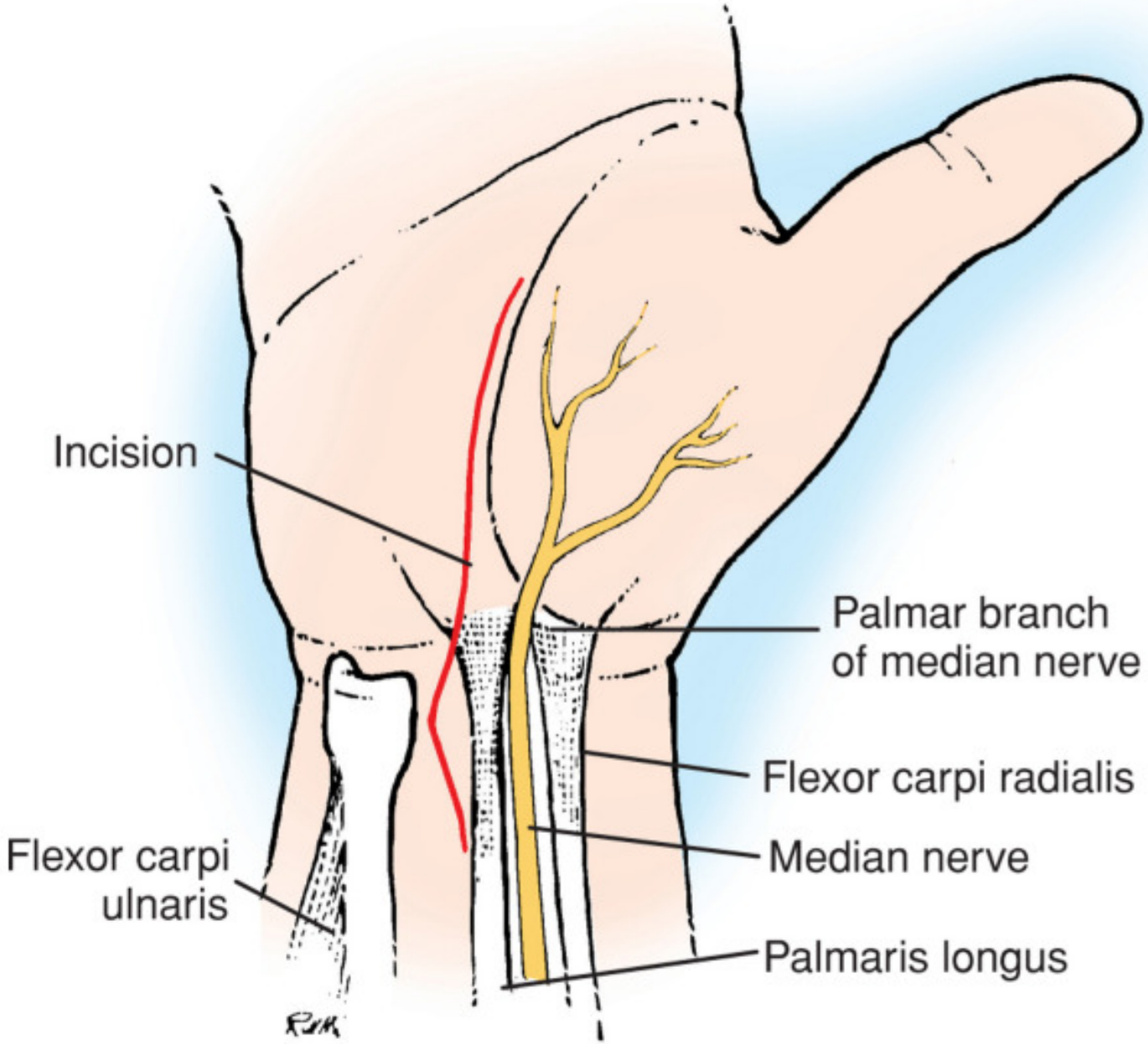
TREATMENT

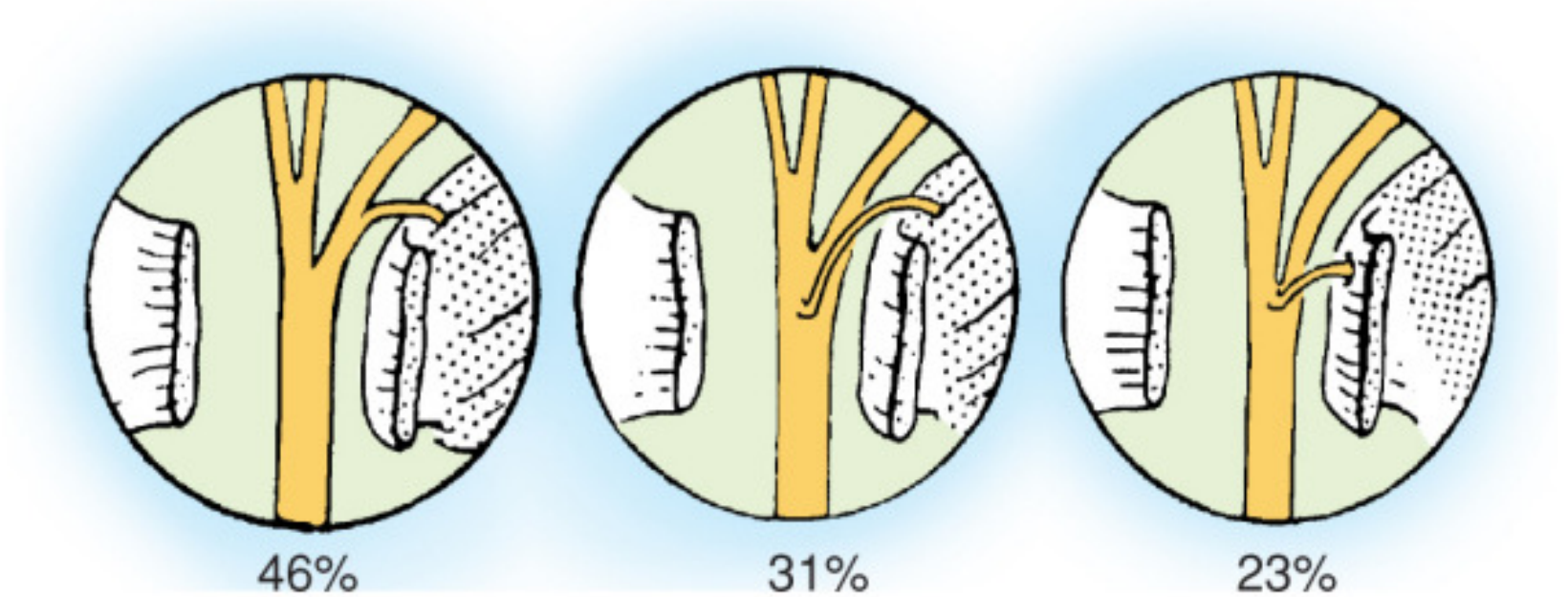
- SPLINT
- MODIFICATION of ACTIVITIES
- STEROID INJECTION…Avoid nerve damage

- Operation.. When conservative Rx fails

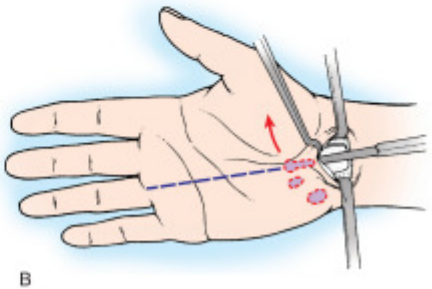
  Thenar weakness/wasting


Transverse
carpal
ligament
Ulnar
nerve
Radial
artery
Ulnar
artery
Median nerve


Incision
Palmar branch
of median nerve
Flexor carpi radialis
Median nerve
Palmaris longus
Flexor carpi
ulnaris


46%
31%
23%

A



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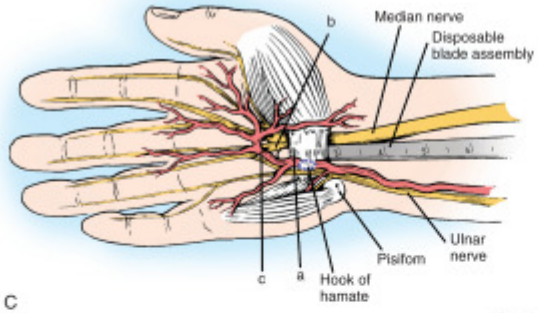

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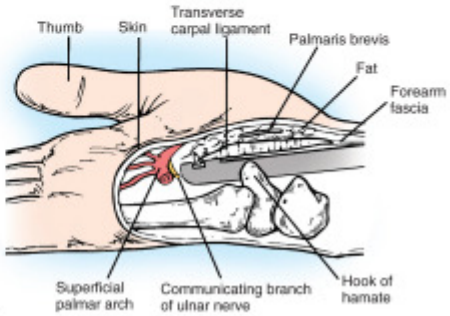

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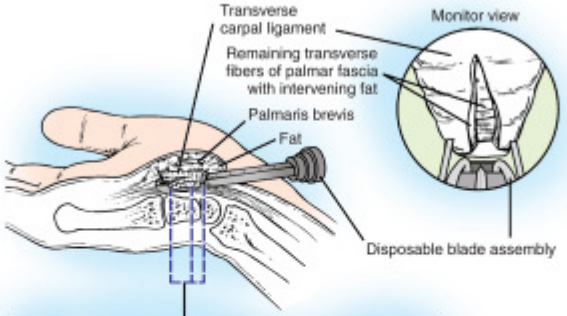
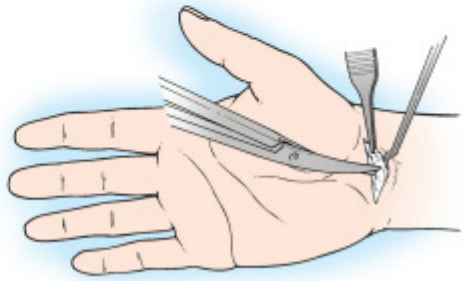


Release distal 1/2 to 2/3 of transverse carpal ligament completely before making a final pass to release the remainder of the ligament. This prevents fat located superficial to the proximal portion of the ligament from dropping into the wound and compromising the surgeon's endoscopic view of the extent of the ligament division.

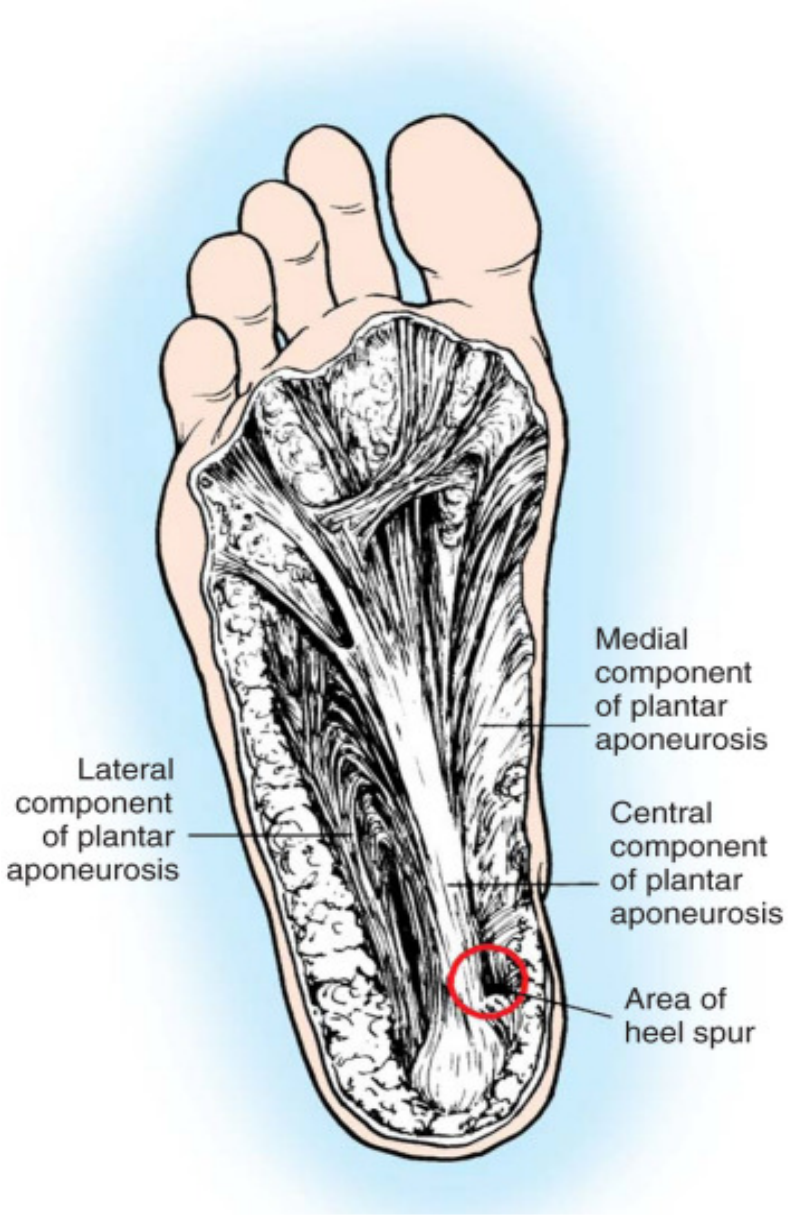
E

F

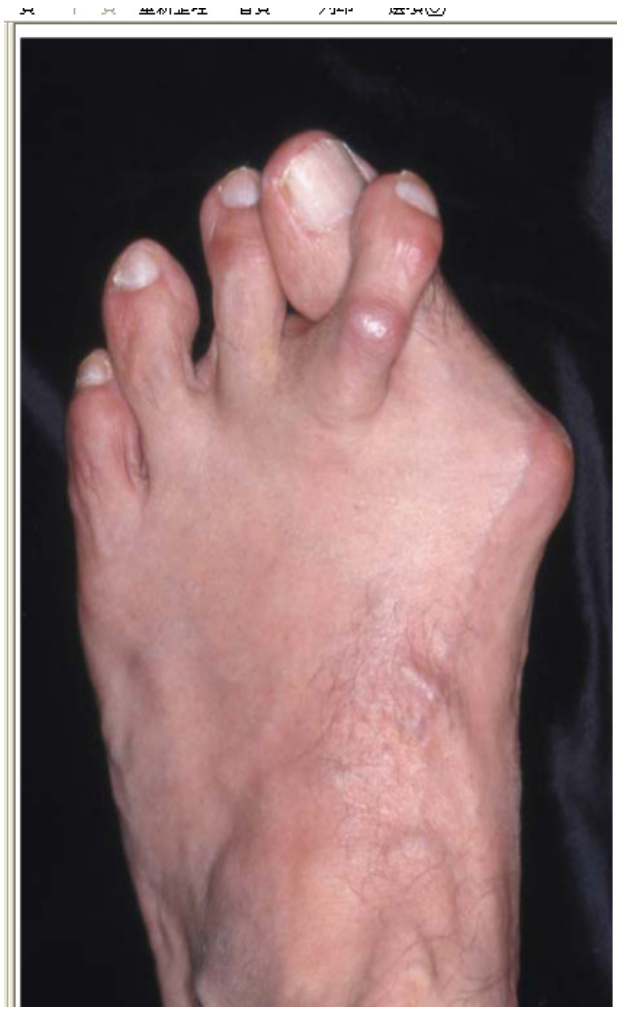


G

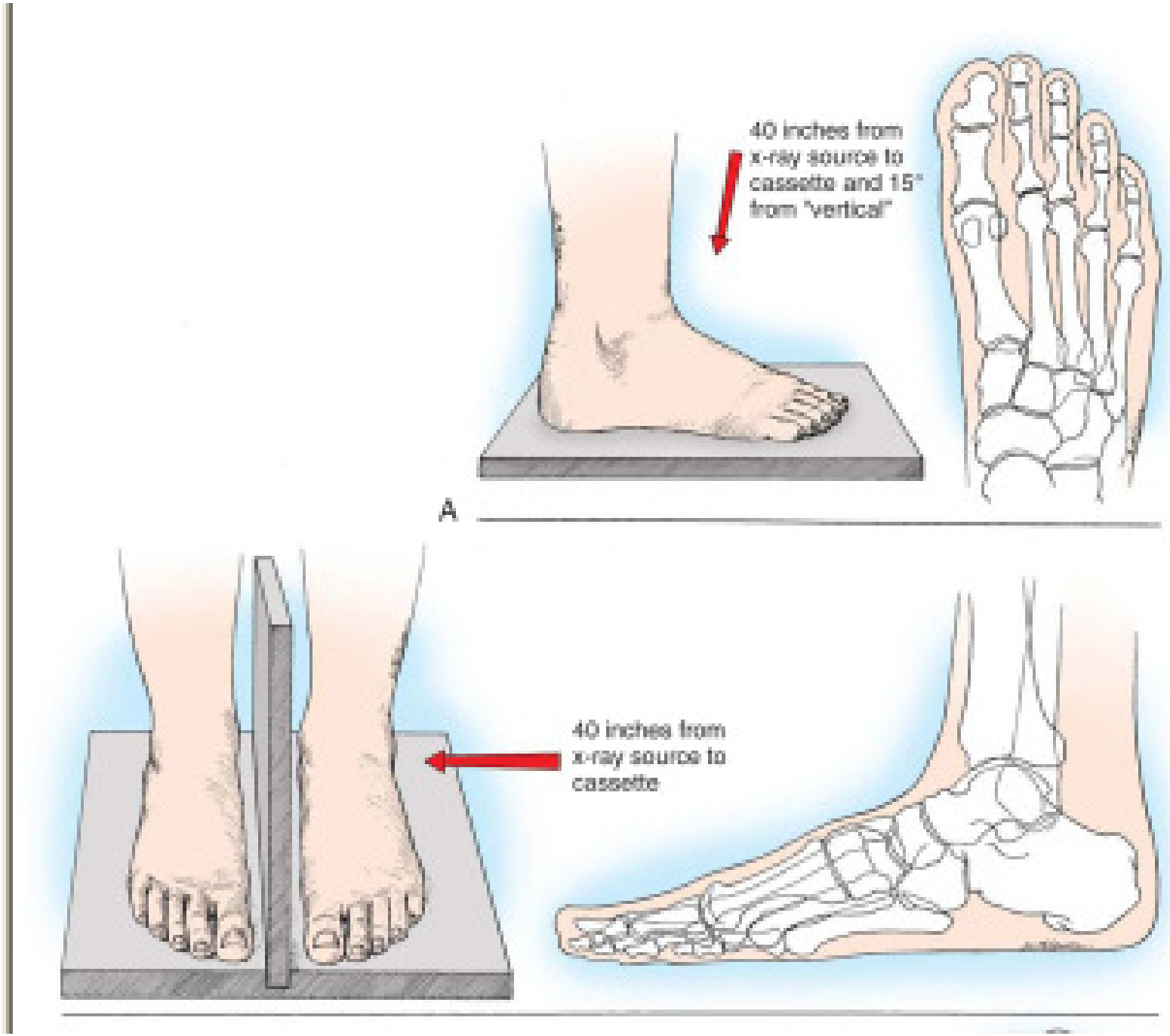
PAINFUL HEEL



HALLUX VALGUS




52°
20°


40 inches from
x-ray source to
cassette and 15°
from "vertical"
A
40 inches from
x-ray source to
cassette

SOFT TISSUE RELEASE

exposed.

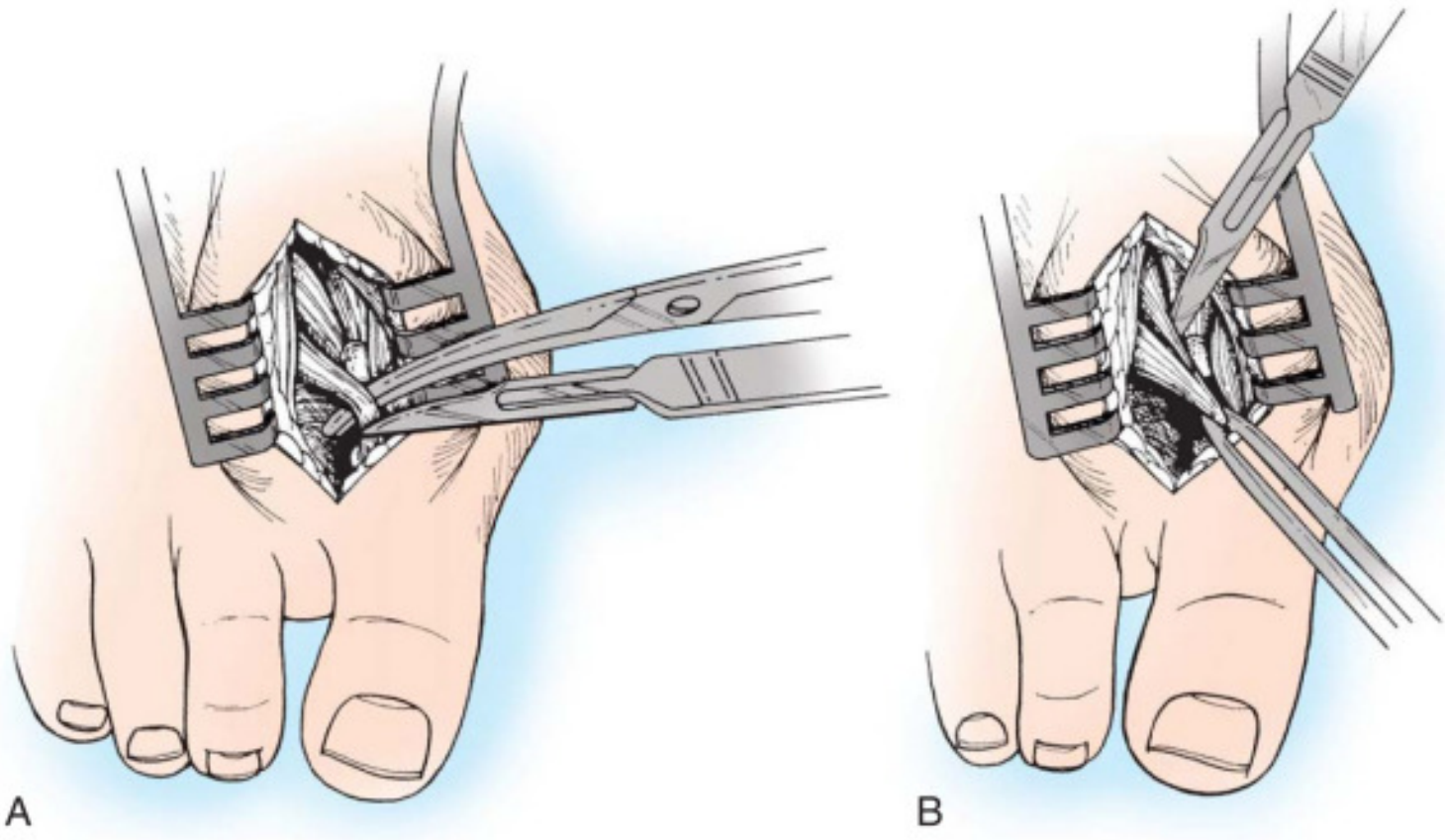


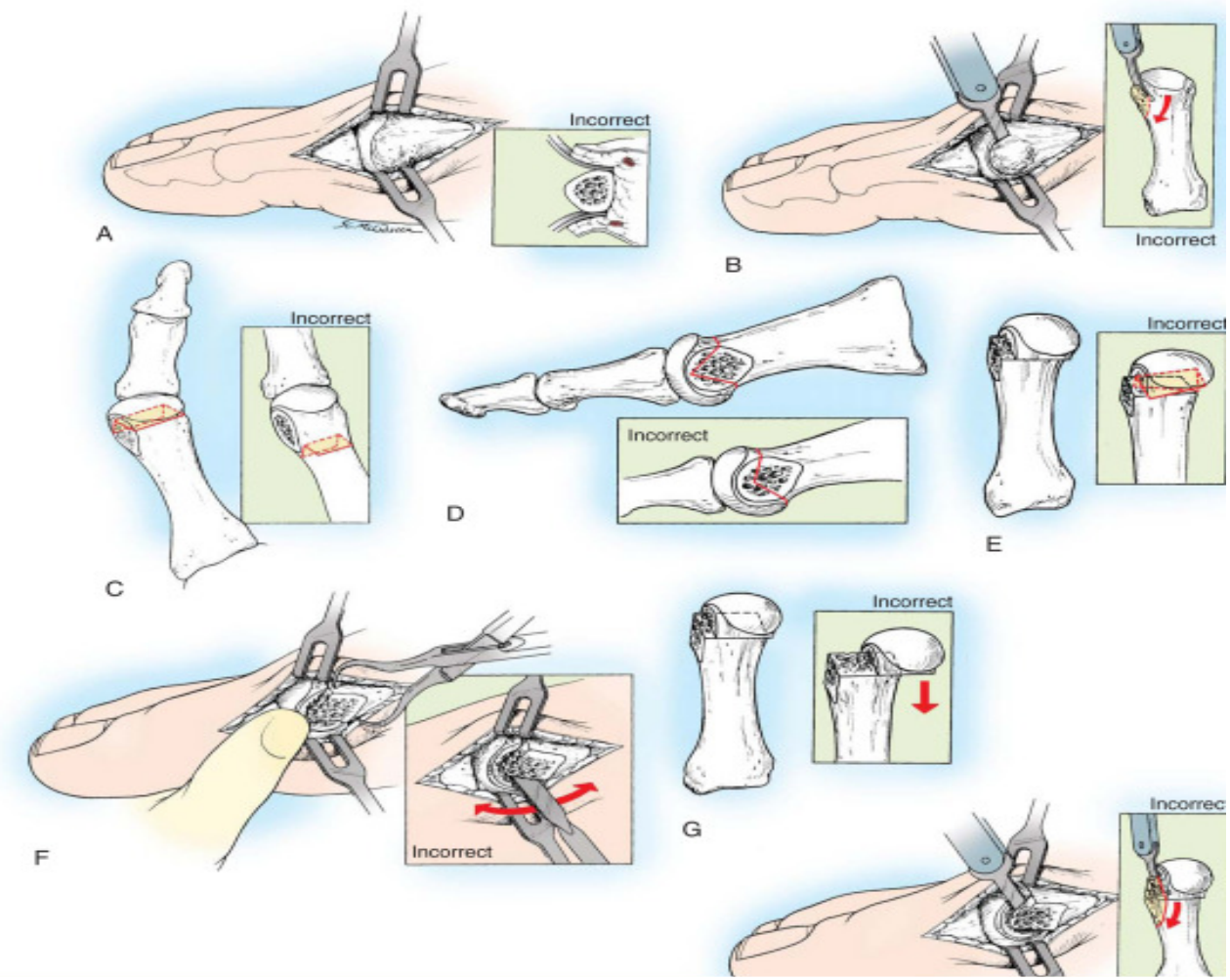
Fig. 78-19 Modified McBride procedure. **A** and **B,** Adductor hallucis is exposed and released (see text).

A

B

BONE PROCEDURE

- Be careful not to loosen all the proximal attachments of the capsule on t
- In addition, to preserve vascularity to the capital fragment, do not strip t



COMBINED