

The background features abstract, flowing waves of color. The top edge is dominated by a bright yellow wave that transitions into a deep red. Below this, there are more complex, layered waves in shades of red, orange, and yellow, creating a sense of movement and depth. The overall effect is vibrant and dynamic.

TUBERCULOSIS OF HIP



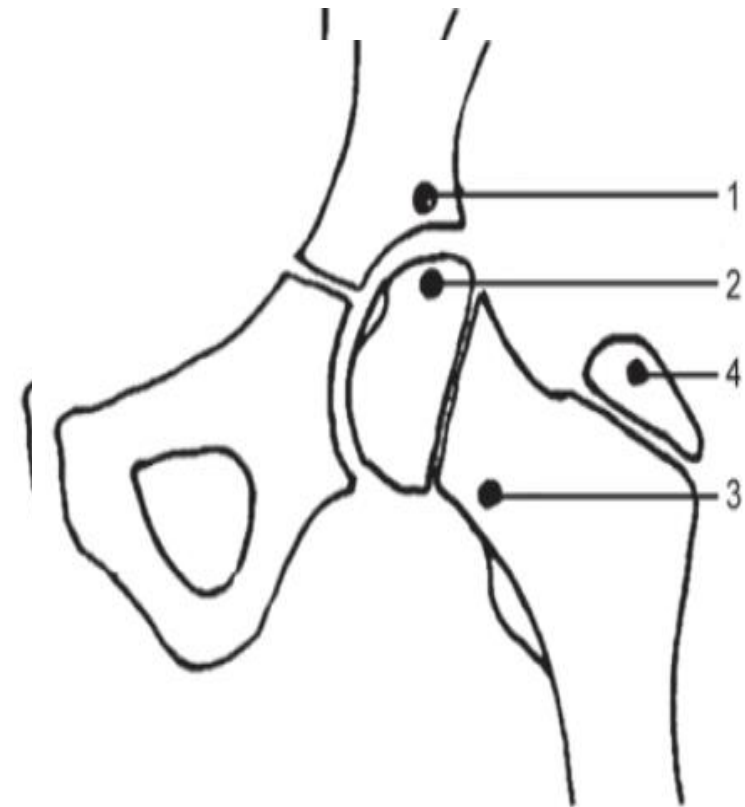
HERE WE GO

- ❖ INTRODUCTION
- ❖ PATHOGENESIS
- ❖ CLINICAL FEATURES
- ❖ STAGES
- ❖ CLASSIFICATION
- ❖ INVESTIGATIONS
- ❖ MANAGEMENT

INTRODUCTION

- Tuberculosis is one of oldest disease known to affect human.
- Chronic granulomatous infection by mycobacterium tuberculosis, bovis , africanum.
- INDIA has highest burden of World tb 20%, (1in 5 cases)
- Incidence – 75 cases/lakh /yr.
- Osteo-articularicular tb constitutes 1-3%
- Spine is most commonc site (50%)
- 2nd most common is hip(15%).

SITES



- **Acetabular Roof (Most Common)**
- **Epiphysis,**
- **Metaphyseal Region (Babcock's Triangle)**
- **Greater Trochanter (Least common)**

BABCOCK'S TRIANGLE

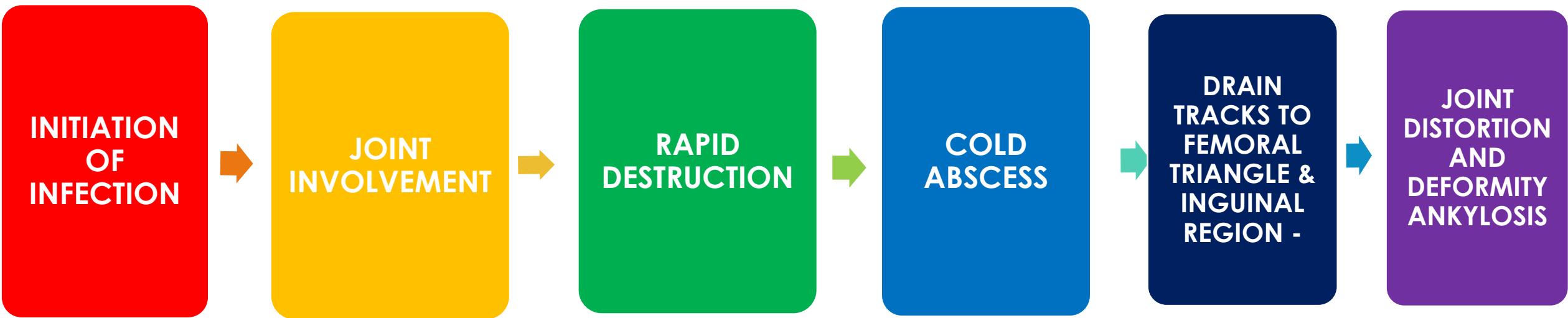


BABCOCK'S
TRIANGLE

Babcock's triangle :

A relatively radiolucent seen on an anteroposterior radiograph of the hip in the subcapital region of the femoral head. It is an area of loosely arranged trabeculae noted between the more radiodense lines of the normal bony trabeculae groups.

DISEASE COURSE



COLD ABSCESS

- **A cold abscess usually forms within the joint**
- **Intrapelvic abscess**
 - **above the levator ani muscle tracks upwards to inguinal region;**
 - **those below this muscle track into the ischiorectal fossa**

CLINICAL FEATURES

- **Commonest age of start of illness is during first 3 decades.**
- **Insidious / gradual onset**
- **Chronic course**
- **Constitutional symptoms**
- **Presenting symptoms**
 - Pain**
 - Limping**
 - Deformity**
 - Fullness around the hip**



CLINICAL FEATURES

- Pain is often referred to the medial aspect of the knee
- Maximum towards the end of the day- NIGHT CRY
- Limp is the earliest and commonest symptom patient
- Typical antalgic gait

STAGES OF DISEASE

- 1** Tubercular Synovitis (Stage I)
- 2** Early Arthritis (Stage II)
- 3** Advanced Arthritis (Stage III)
- 4** Advanced Arthritis with Subluxation or Dislocation (Stage IV)

STAGES

<i>Stages</i>	<i>Clinical findings</i>	<i>Radiologic features</i>
1. Synovitis	Flexion, abduction, external rotation, apparent lengthening	Soft tissue swelling, haziness of articular margins and rarefaction
2. Early arthritis	Flexion, adduction, internal rotation, apparent shortening	Rarefaction, osteopenia, marginal bony erosions in femoral head, acetabulum or both, No reduction in joint space
3. Advanced arthritis	Flexion, adduction, internal rotation, shortening	All of the above and destruction of articular surface, reduction in joint space
4. Advanced arthritis with subluxation/ dislocation	Flexion, adduction, internal rotation with gross shortening	Gross destruction and reduction of joint space, wandering acetabulum

There is progressive loss of motion in various stages; least in stage of synovitis and gross in arthritis with subluxation/dislocation.

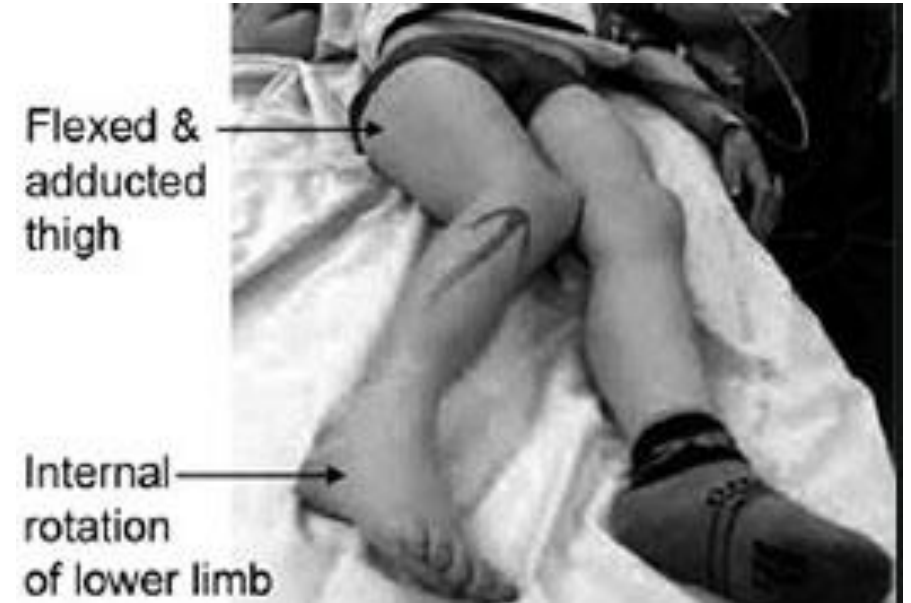
STAGE OF SYNOVITIS -IRRITABLE HIP

- PAINFUL MOVEMENT
- FABER- FLEXION ABDUCTION EXTERNAL ROTATION
- APPARENT LENGTHENING NO TRUE/REAL SHORTENING
- X RAY – SOFT TISSUE SWELLING ,
- USG - SOFT TISSUE SWELLING
- MRI – SYNOVIAL EFFUSION
- BIOPSY- CAN BE DONE FOR CONFIRMATION



EARLY ARTHRITIS (STAGE II)

- DESTRUCTION OF ARTICULAR CARTILAGE
- FLEXION ADDUCTION INTERNAL ROTATION (FADIR)
- DECREASED ROM
- NO TRUE/REAL SHORTENING OF LESS THAN 1 CM,
- X RAY
 - LOCALIZED OSTEOPOROSIS,
 - SLIGHT DECREASE IN JOINT SPACE DUE TO DECREASE IN THE VERTICAL HEIGHT OF THE ARTICULAR CARTILAGE AND
 - LOCALIZED EROSIONS AT THE ARTICULAR MARGINS
- MRI - SYNOVIAL EFFUSION , EDEMA, MINIMAL BONE DESTRUCTION



ADVANCED ARTHRITIS (STAGE III)

- **FADIR – FLEXION ADDUCTION INTERNAL ROTATION DEFORMITIES,**
- **RESTRICTION OF MOVEMENTS, MUSCLE WASTING**
- **TRUE SHORTENING >1 CM**
- **GROSS DESTRUCTION OF ARTICULAR CARTILAGE AND BONES OF THE FEMORAL HEAD AND ACETABULUM**
- **CAPSULE IS FURTHER DESTROYED, THICKENED AND CONTRACTED**
- **X-RAY – JOINT SPACE REDUCTION*, ERODED ARTICULAR MARGINS.**

ADVANCED ARTHRITIS WITH SUBLUXATION OR DISLOCATION (STAGE IV)

- DESTRUCTION OF ACETABULUM, FEMORAL HEAD, CAPSULE AND LIGAMENTS
- HEAD OF FEMUR DISPLACE UPWARDS AND DORSALLY IN THE **WANDERING OR MIGRATING ACETABULUM**
- LEAVING ITS LOWER PART EMPTY AND SHENTON'S ARC BROKEN
- FRANK POSTERIOR DISLOCATION OF THE FEMORAL HEAD
- GROSSLY RESTRICTED ROM & REDUCED JOINT SPACE



WANDERING
ACETABULUM



STAGE 4

**I SOME CASES THE FEMORAL HEAD AND NECK ARE GROSSLY
DESTROYED,**

COLLAPSED AND SMALL IN SIZE ,

CONTAINED IN AN ENLARGED ACETABULUM-

MORTAR AND PESTLE APPEARANCE (SHANMUGASUNDARAM)



MORTAR AND
PESTLE
APPEARANCE

CLASSIFICATION OF THE RADIOLOGICAL APPEARANCE

- Shanmugasundaram (1983) suggested a radiological classification for tuberculous disease of the hip applicable for the lesions in children (C) and adults (A)
- TYPE 1 NORMAL (c)
- TYPE 2 TRAVELLING ACETABULUM(C,A)
- TYPE 3 DISLOCATION (c)
- TYPE 4 PERTHES DISEASE (c)
- TYPE 5 PROTRUSIO ACETABULI (C,A)
- TYPE 6 ATROPHIC (A)
- TYPE 7 MORTAR & PESTLE (C,A)



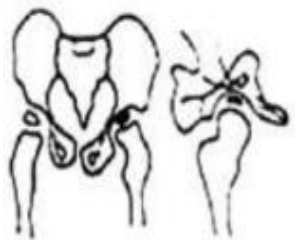
Type 1. 'Normal'



Type 2. Travelling acetabulum



Type 3. Dislocating



Type 4. Perthes



Type 5. Protrusio acetabuli



Type 6. Atrophic



Type 7. Mortar and pestle

SHANMUGASUNDARAM CLASSIFICATION

INVESTIGATION

- CBC
- ESR
- TB ELISA
- TB PCR
- CBNAAT
- X RAY HIP
- MRI
- EFFUSION
- SYNOVIAL BIOPSY
- SMEAR & CULTURE

X RAY

- **PERI ARTICULAR OSTEOPENIA**
- **SOFT TISSUE SWELLING**
- **MINIMAL PERIOSTEAL REACTION**
- **JOINT SPACE NARROWING**
- **SUBCHONDRAL EROSIONS**

ASPIRATION OF ABSCESS

- **SMEAR & CULTURE OF PUS – GOLD STANDARD**
- **SOLID MEDIA- 3-8 WEEKS**
 - LJ MEDIA- EGG BASED**
 - MIDDLE BROTH- AGAR BASED**
- **LIQUID BROTH 1-2 WEEK**
- **BACTAC MEDIA FOR FASTER CULTURE**

CB-NAAT

- **CB-NAAT / Xpert MTB is FULLY AUTOMATED CARTRIDGE BASED NUCLEIC ACID AMPLIFICATION TECHNIQUE USING PCR**
- **IS A MOLECULAR DIAGNOSTIC METHOD**
- **MOST IMPORTANT TOOL FOR DETECTING TB CASE AND RIFAMPICIN RESISTANCE TB.**
- **DETECTS TB GENOME- rpo b**
- **REQUIRE LESS THEN 2 HOURS AND MINIMAL HANDS ON.**
- **HIGH SENSITIVITY AND SPECIFICITY OF MORE THAN 90%.**



PROGNOSIS

- Depends essentially on the **stage of the disease** when the treatment is initiated
- Early disease (synovitis or early arthritis) may heal by leaving nearly normal hip joint
- Healing in advanced arthritis generally results in fibrous ankylosis
- If correction of deformities was not achieved by treatment (traction, splintage or operation) the ankylosis is likely to occur in a bad position of flexion and adduction
- Limb may show gross shortening later.

MANAGEMENT

- Liberal diet, fresh air, sunshine, education and occupation
- Antituberculous chemotherapy is started
- Non operative management
 - Traction
- Operative management
 - Drainage of abscess
 - Synovectomy
 - Osteotomy
 - Arthrodesis
 - Excision arthroplasty
 - Joint replacement
- Physiotherapy

STAGEWISE MANAGEMENT

Synovitis.

2RHZE/10–16RHE, above-knee skin traction or skeletal traction, Surgery is rarely required



Early arthritis.

2RHZE/10–16RHE, above-knee skin traction or skeletal traction, non-weight bearing exercises



Advanced arthritis.

2RHZE/10-16RHE, Arthrolysis with joint debridement, skeletal traction, supervised mobilization of the hip



Advanced arthritis with subluxation/dislocation.

2RHZE/10–16RHE, traction, excision arthroplasty, arthrodesis or total hip replacement

CHEMOTHERAPY - DOTS

New guidelines 2016 – Daily regimen

- Daily medicine
- Dosing according to four weight bands (25-39 kg / 40-54 kg / 55-69 kg / > 70 kg)
- Fixed drug combinations (single tablet contains all 4 drugs)
- HRE in continuation phase (not HR)

2RHZE/10–16RHE

Synovitis.

Early
arthritis

Advanced
arthritis.

Advanced
arthritis with
subluxation/
dislocation.



CHEMOTHERAPY - DOTS

Weight category	Number of tablets to be consumed		Inj. Streptomycin (gm)
	Intensive phase	Continuation phase	
	H R Z E	H R E	
	75/150/400/275 mg per tab	75/150/275 mg per tab	
25-39 kg	2	2	0.50
40-54 kg	3	3	0.75
55-69 kg	4	4	1
≥70	5	5	1

NON OPERATIVE

- Traction – bilateral traction k/a **WELL LEG TRACTION**
 - Relieves the muscle spasm, provide rest to the limb , relives pain
 - Prevents or corrects deformity and subluxation,
 - Maintains the joint space and length .
- In the presence of abduction deformity bilateral traction is mandatory
otherwise traction to the deformed limb alone would increase the abduction deformity further

PHYSIOTHERAPY AFTER NON OPERATIVE MX

- If no gross ankylosis, active assisted movements of the hip are started as soon as possible.
- Hip mobilization exercises should gradually increased
- after 4 to 6 months permit ambulation with suitable orthosis and crutches
- Ambulation should be non-weight bearing for first 12 weeks and partial weight bearing for the next 12 weeks
- weight bearing is usually permitted after 18 to 24 months from the onset of treatment

OPERATIVE MX IN CHILDREN

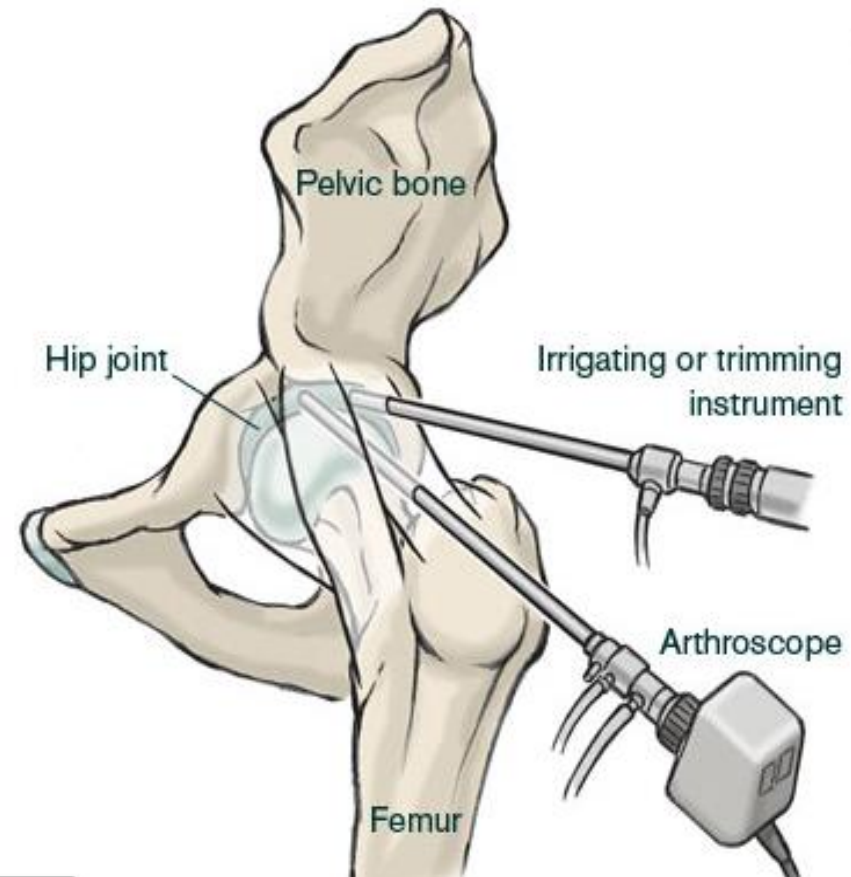
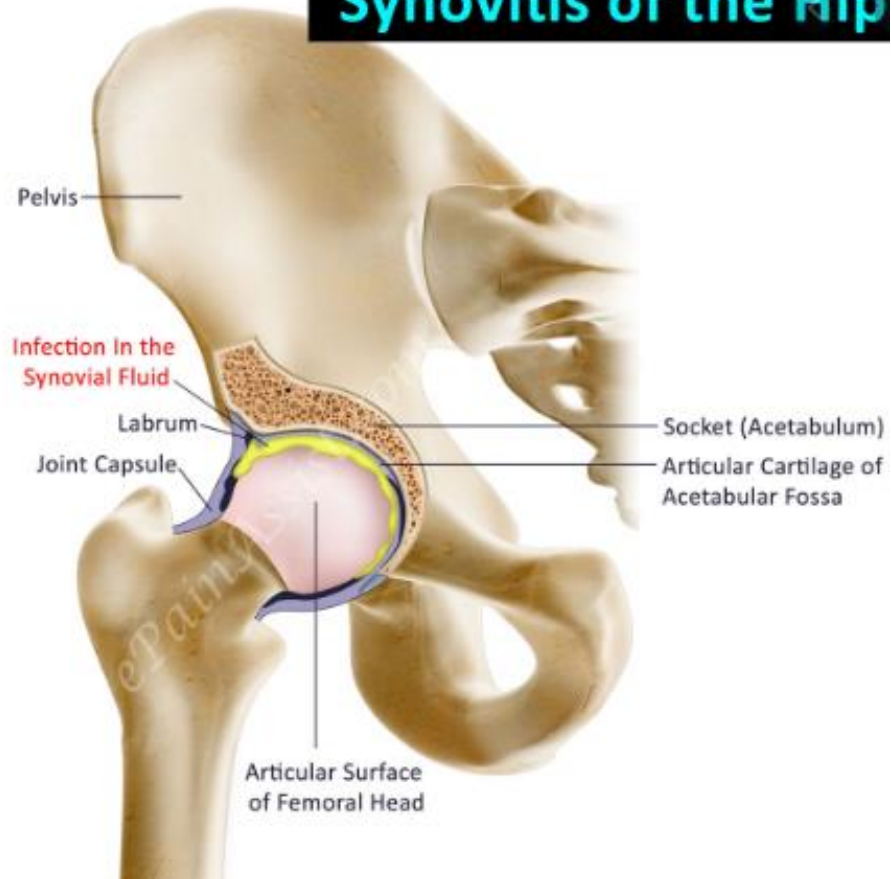
- **Failure to achieve correction of gross deformities and minimization of subluxation/ dislocation in children warrants**
 - **open arthrotomy,**
 - **synovectomy and**
 - **debridement of the diseased joint**
- **Arthrodesis or excisional arthroplasty in children should be deferred till the completion of growth potential of the proximal femur.**

STAGE OF DISEASE AND OPERATIVE PROCEDURE

In synovial stage	<ul style="list-style-type: none"> • Arthrotomy • Synovectomy 	Postoperatively triple drug therapy, traction, intermittent active and assisted exercises should be continued for 4 to 6 weeks
In early arthritis	<ul style="list-style-type: none"> • Joint clearance or joint debridement • Arthrotomy • Synovectomy 	“
With <i>advanced arthritis</i> with or without dislocation/ subluxation	<ul style="list-style-type: none"> • Osteotomy • Arthrodesis • Girdlestone's type excisional arthroplasty • Joint replacement 	“

SYNOVECTOMY

Synovitis of the Hip



SYNOVECTOMY

- **Incise the capsule and exposed the hip joint (by any approach)**
- **Separate the hypertrophied synovium from**
 - **The inner surface of the capsule and from**
 - **The synovial reflections near the acetabular rim and on the femoral neck.**
- **From the inner surface of the capsule the diseased and thickened capsule may be excised.**
- **Diseased synovium from the retinacular reflections on the femoral neck should be gently curetted away.**

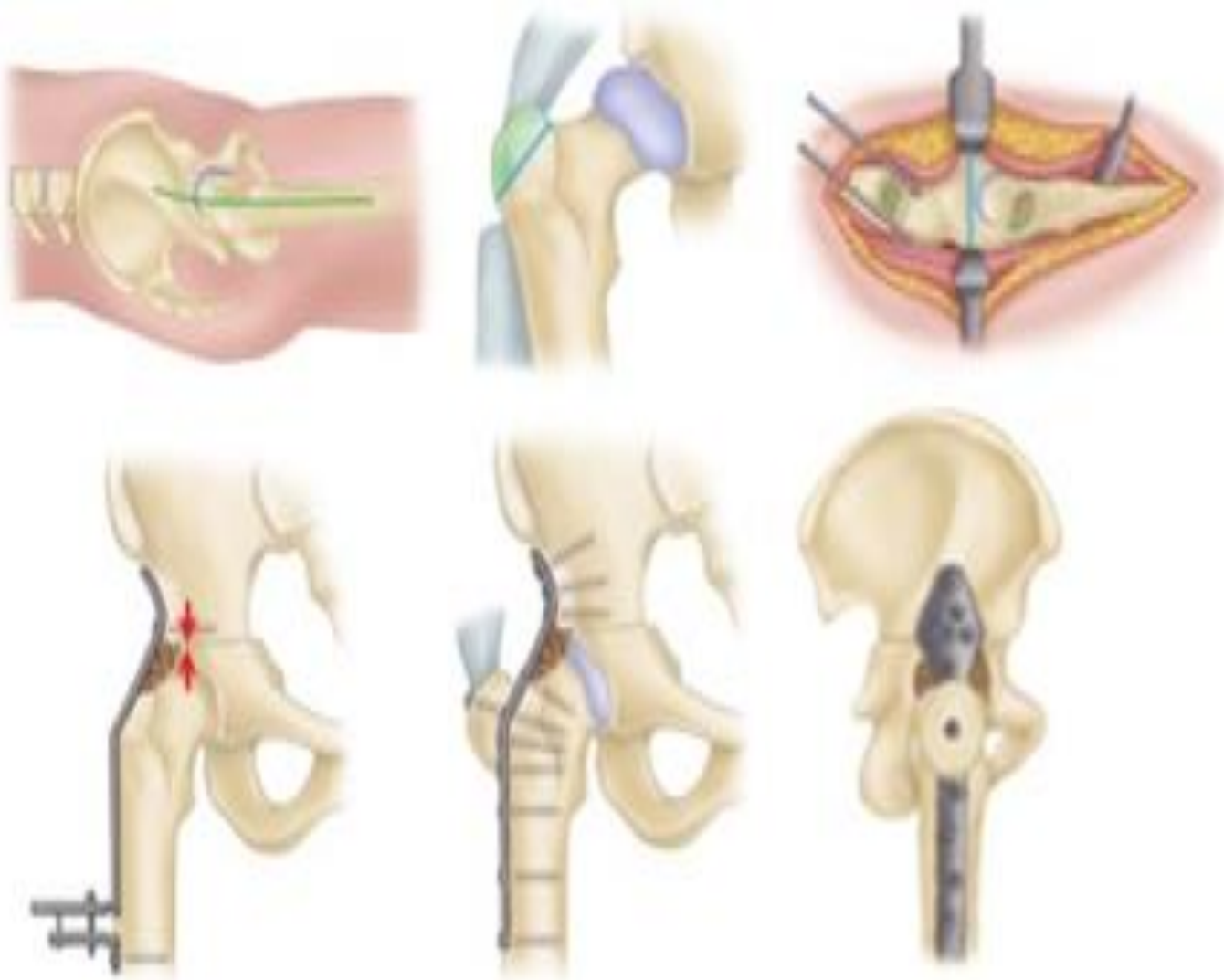
JOINT DEBRIDEMENT

- Destroyed areas in the femoral head and neck and in the acetabulum may require curettage
- Loosend pieces of articular cartilage, granulation tissue and loose bodies/debris within the joint ,should be removed
- Refrain from peeling the articular cartilage off the underlying Bone,
- One should preserve the retinacular/intracapsular vessels at all cost.
- Possible complications of synovectomy and debridement include
 - Avascular necrosis of femoral head,
 - Slippage of the proximal femoral epiphysis in children, and
 - Fracture of the femoral neck or acetabulum

OSTEOTOMY

- **Upper femoral corrective osteotomy**
- **Operation is a simple extracapsular procedure and**
- **Can be done at any age**
- **Ideal site for corrective osteotomy is as near the deformed joint as possible**

ARTHRODESIS



ARTHRODESIS

GOALS – painless stable fixed joint

Before the availability of effective antitubercular drugs one preferred to perform an extra-articular fusion

- With modern drugs however, direct intracapsular fusion is favored
- Classically, this operation is indicated in an adult presenting with unsound (painful fibrous ankylosis) ankylosis with active or healed disease
- Should be deferred so long as the bones of the hip joint have any growth potential

ARTHRODESIS

- **Activities that get maximally limited after fusion of the hip joint are**
 - **Bending, sitting on floor, cross-legged sitting, squatting,**
 - **Kneeling, sports, sexual mechanics (in women), and bicycling**
- **Best position for fusion of the hip joint is**
 - **1 to 30 degrees of flexion (depending upon age),**
 - **No abduction or adduction (in adults), and**
 - **5 to 10 degrees of external rotation.**
- **If tuberculous disease in the hip is active, or the joint has a painful fibrous ankylosis, it is wise to perform an intra-articular arthrodesis.**

GIRDLESTONE'S EXCISION ARTHROPLASTY



Xray After Girdlestone Arthroplasty



GIRDLESTONE'S EXCISION ARTHROPLASTY

- **GOALS- PAINLESS, UNSTABLE, MOBILE HIP JOINT**
- Girdlestone (1950) described excision of the
 - Femoral head,
 - Neck,
 - Proximal part of trochanter and the
 - Acetabular rim for chronic deep seated infections

Best suited for indian subcontinent people, whose essential activities are squatting, sitting crosslegged and kneeling

Can be carried out in healed or active disease

After the completion of growth potential of bones.

PHYSIOTHERAPY



JOINT REPLACEMENT

- **Goals – painless stable and mobile joint**
- **Joint replacement for hip joint that has maintained a healed status for about 5 years is being debated at present**
- **It is mandatory to administer modern antitubercular drugs for about 5 months after any replacement procedure.**
- **Despite best of selection, risk of reactivation may occur in one-third of patients**



TAKE HOME

- **Tb is chronic debilitating disease**
- **Xray is still an important tool to guide for further management in bone tb**
- **Prompt diagnosis and early intervention is key to recovery.**
- **Treatment must be chosen by the patient, explain them all the possibilities**
- **Counselling plays a very important role as patient come to you**
- **Post op rehabilitation And care is necessary.**



THANK YOU