SLIPPED FEMORAL EPIPHYSIS

Incidence: 2/100000
Mean age: Males 13 and Females 11 years
Male predominance
Bilateral in 25%
Polynesian: 4.5 times Caucasians
Autosomal dominance with incomplete penetrance
7% if sibling affected and 3% with parent affected
Obesity seems to be a key factor increase shear stress at the physis

Pathogenesis

Mechanical when obesity is associated with:
a. Reduction in anteversion of the femoral neck
b. Abnormal slope of the growth plate

Increased physeal height

The thinning of the perichondral complex

Maturation factors

The slip appears to occur in a narrow skeletal age range.
In girls SCFE almost exclusively occurs before the menarche.

Endocrine

High growth hormone and low testosterone
Routine testing for hormones is controversial

In endocrinopathy are usually bilateral at first presentation

Signs and symptoms

In over 50% of cases there is a history of injury.
Pain is in the groin but very often around the knee between 10-15 years.
Antalgic gait is present. Some patients can not weight bear.
Typical history of gradual onset over few weeks.
Deformity: Adduction and External rotation of the Hip
Movement of the hip: Limitation of Flexion, Internal Rotation and Abduction.
Shortening of 1-2 cm is common

RADIOLOGICAL EXAMINATION

AP, True lateral, Frog leg

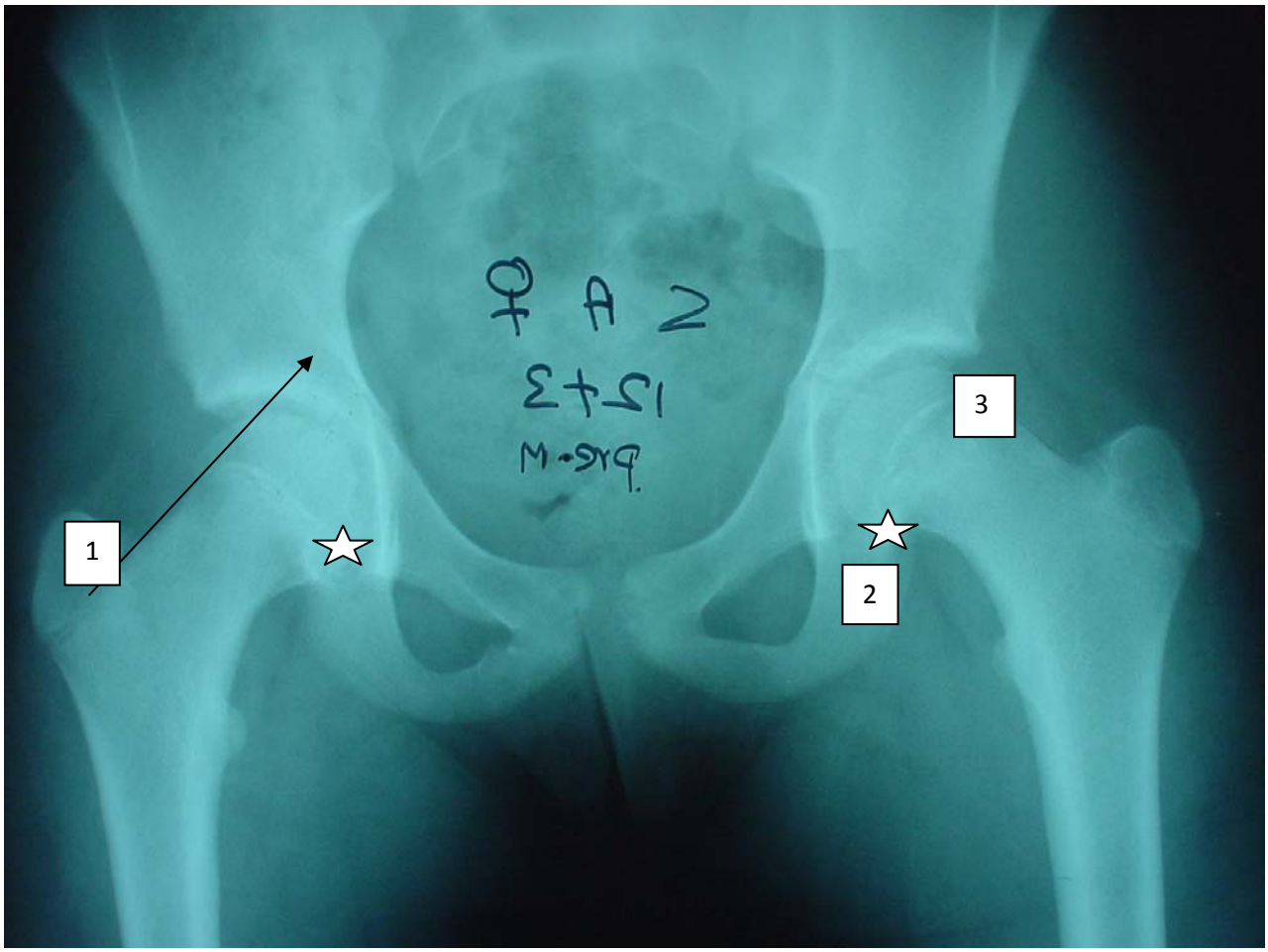
1.Klein's line: Line along the superior border of the neck, normally cuts the epiphysis

Trethovan's sign: Klein's normally cuts the physis

2. Capeners sign **T**he medial junction of Epiphyseo-metaphyses is outside the acetabulum

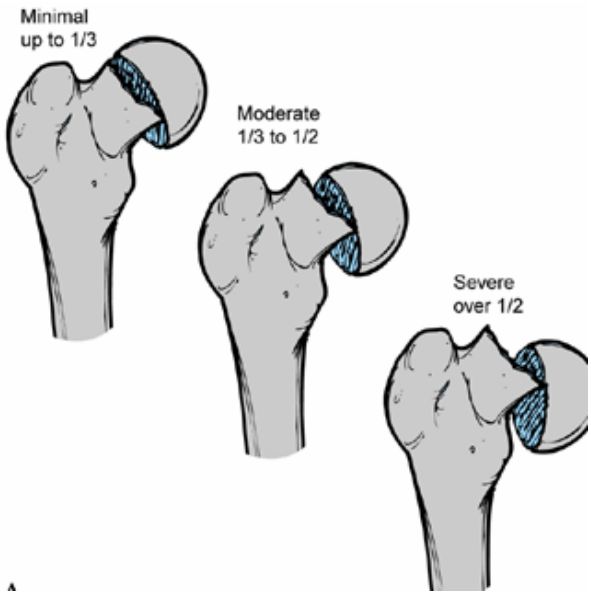
3.Metaphyseal blanch sign of Steel. – Posterior lip of the epiphysis as it begins to slip posteriorly producing a superimposed shadow on the neck

Look for Remodeling, AVN, Chondrolysis



Classification

Mild
Moderate
Severe



LOADER Classification	**Stable**	**Unstable**
Weight bearing	Possible	Not possible
Severity of slip	Less severe	More severe
Good prognosis	96%	47%
AVN	0%	50%

TREATMENT

Commonly used treatment: Is in situ pinning using one central screw.

93% good result. Up to 60% displacement can remodel.

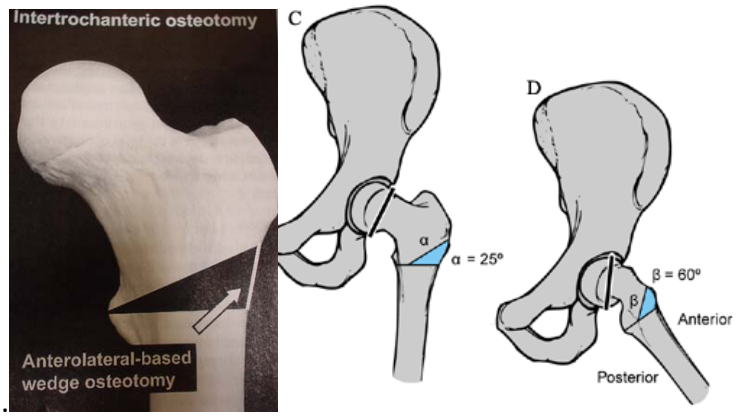
Can allow Touch to partial weight bear for 6 wks

Ideally single screw is used. As complication increases with number of screw used: 1 pin 5% complication, 2 pin 20%; 3 pin 30% [Blanco]

Present recommendation is equal distribution of threads across the physis when using 16-mm thread screws with minimum 3-4 threads in the physes.

This treatment is adequate for Mild and moderate slip. In severe slip, the initial treatment is in situ screw fixation. Forceful reduction should be avoided as this causes avascular necrosis. Usually patient will have deformity which may remodel or can be treated at later date `with subtrochanteric osteotomy [Southwick osteotomy] a year or two later.

Subtrochaneric osteotomy



Complications

1. Avascular necrosis [AVN]

Causes

Forceful reduction is the important cause for AVN.

Neck osteotomies to reduce SFE is associated with high risk of AVN

Multiple screws: Complication rate increases by 10-fold with each increase

Incidence

In situ pinning	5%
In unstable Slip	50%
Neck osteotomy	15%

Treatment options

Leave them alone
Valgus osteotomy
Arthrodesis
Later THR

2.**Chondrolysis**
Causes: Immobilisation, Pin penetration which was not unrecognised, proximal femoral osteotomies, increased severity of slip.

Clinically present with a pain, stiffness.

X ray reduced joint space <3mm in bilateral

5 % incidence

Rx: Antiinflammatory, CPM, Traction

50% will resolve

3.Osteoarthritis

In a large series of Osteoarthriitis hips, SFE accounted for 5%

Untreated SUFE Type III, will be symptomatic within 15 years

At 40 yrs: all slipped epiphyses end up with moderate to severe osteoarthritis.

4. Coxa vara and shortening: May lead to secondary osteoarthritis