

Anatomopathology and Aetiology of congenital hip dislocation

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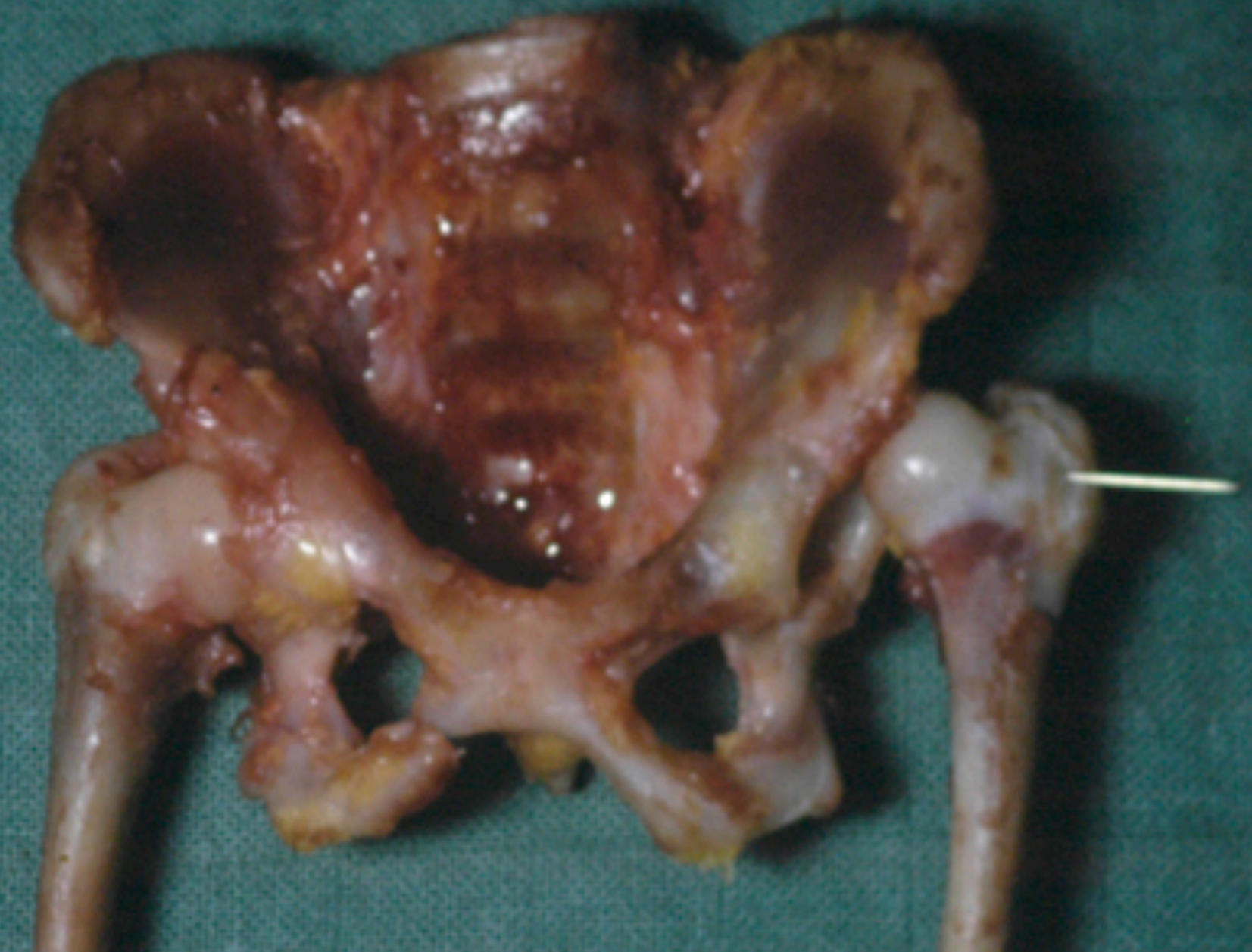
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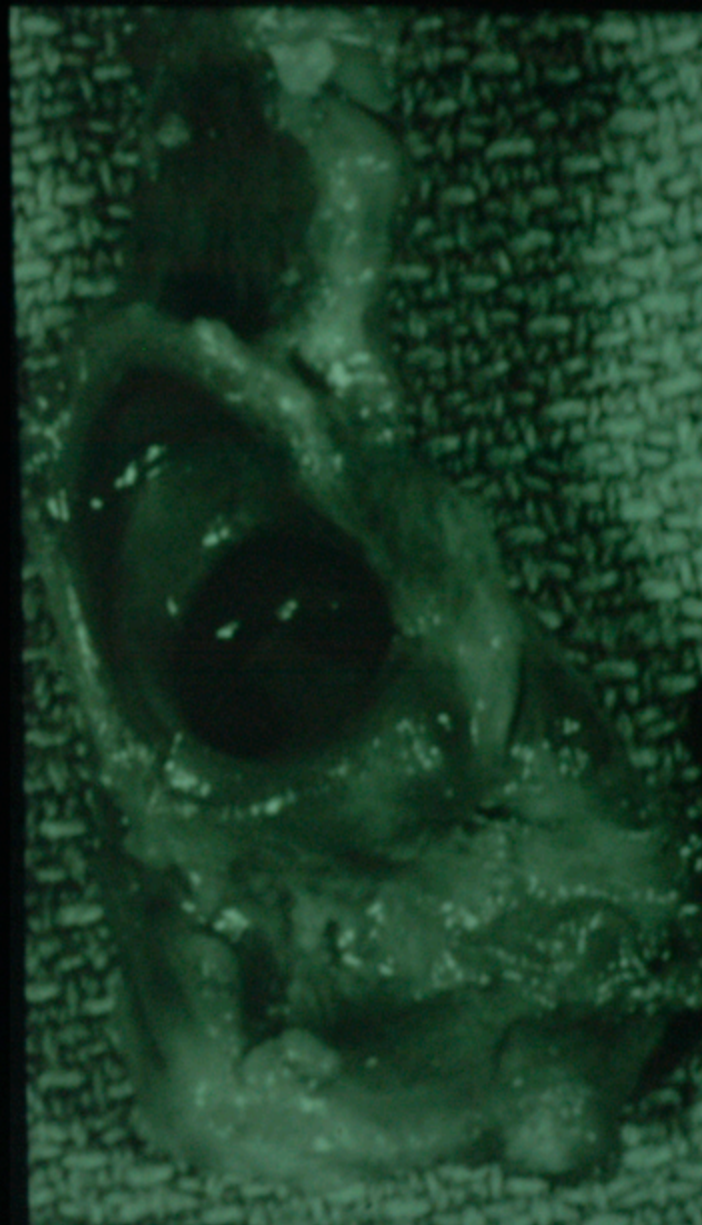
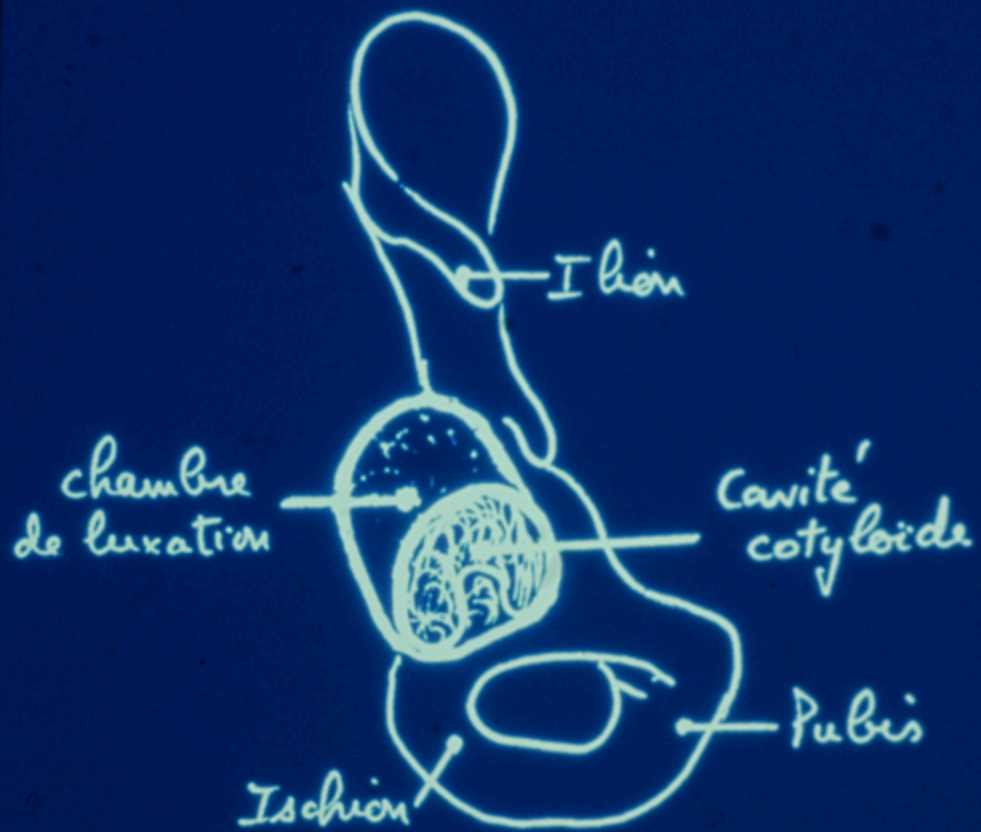
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Trouble of the hip joint development,

generated in utero,

becoming manifest at birth or during the first months of life

Le Damany, 1912

Faber, 1938

Salter, Can Med Assos, 1968

Ortolani, Clin Ortho, 1976

Tachdjian, 1982

1) Genetic theory

→ Endogenous factors

2) Mechanical theory

→ Exogenous factors

1) Genetic theory

Endogenous factors : primitive flaw

Sex ratio : 5 females / 1 male

Geographical/ethnic considerations

Familial incidence

Phenotype

12-fold increase in risk for first degree relative

Stevenson et al. J Pediatr Orthop, 2009

Genotype

Genetic multifactorial transmission

Stalder and Jani, Z Orthop, 1978

Czeizel and al, J Med Genet, 1975

Primitive acetabular dysplasia ?

Secondar acetabular dysplasia (Experimental data in animals)

→Dislocating posture

Asplund and Hjemstedt, Acta Orthop Scand, 1983

Michelsson et Langenskiold, JBJS Am, 1972

Salter and al, JBJS Am, 1963

→Anatomical destabilization

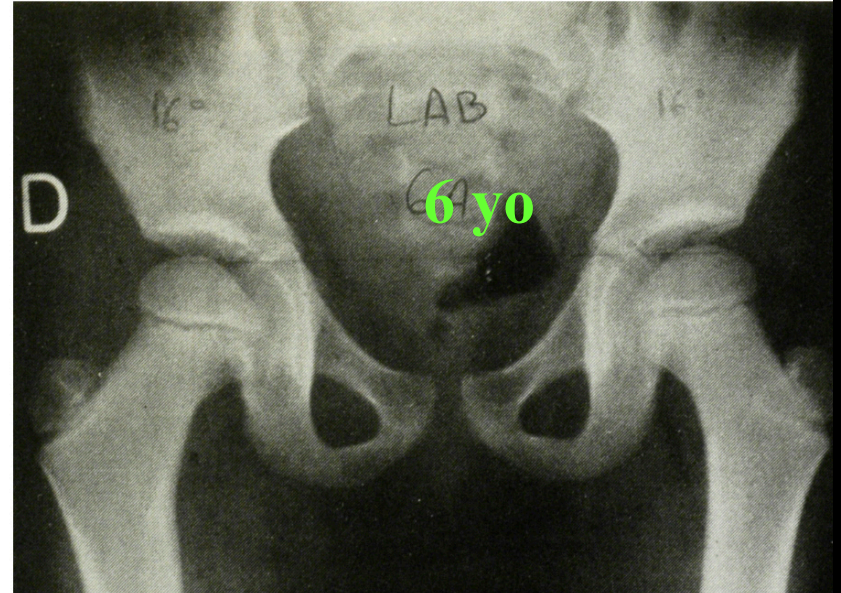
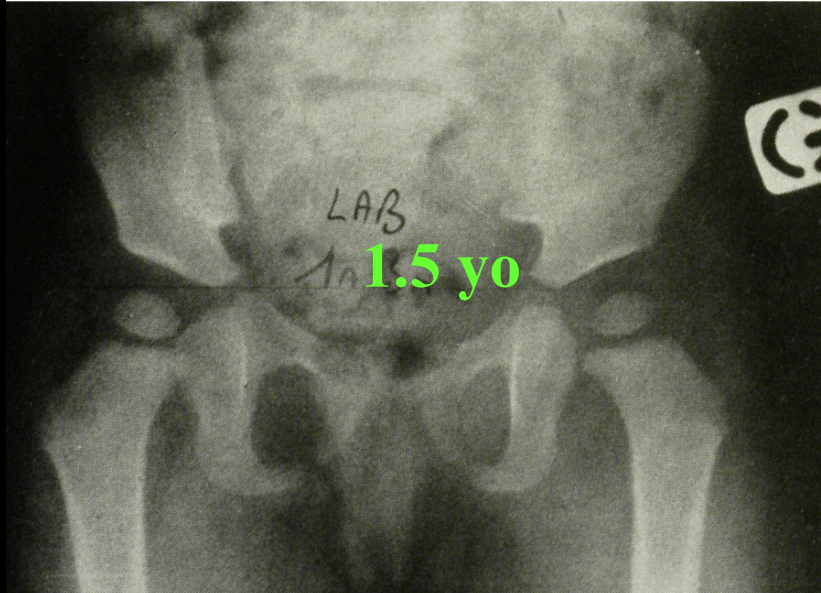
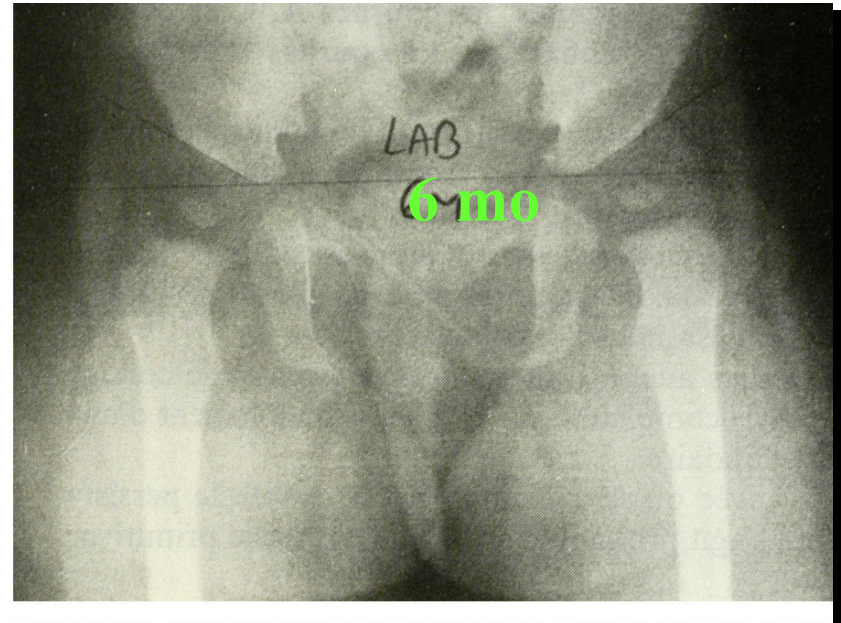
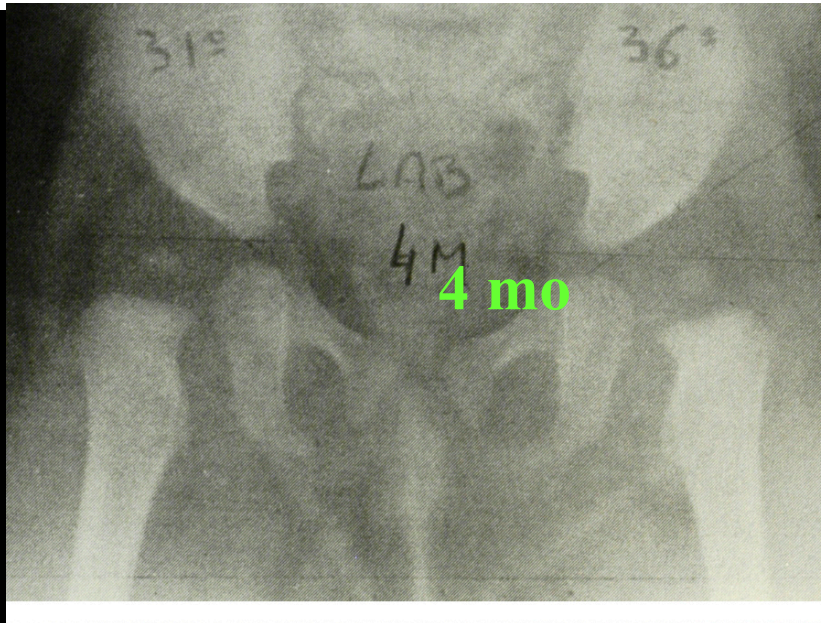
Langenskiold and al, JBJS Br, 1962

Sibrandj, JBJS Br, 1962

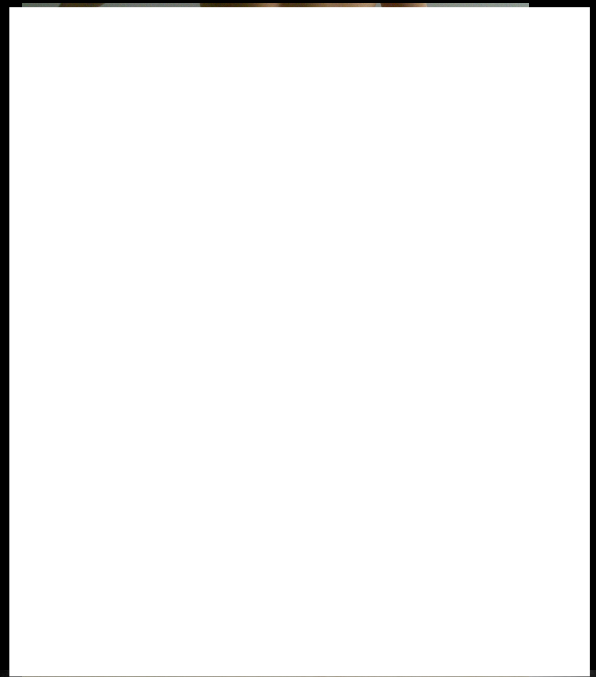
Smith et al, JBJS Am, 1963

Natural history of acetabular dysplasia with subluxation

Mladenov et al., J Pediatr Orthop, 2001 (series of Saint-Vincent de Paul)



2.5 yo



7 years old



Hip dislocation induces acetabular dysplasia,
and not inversely.

Acetabular dysmorphism

Lack acetabular depth = constitutional predisposition to CDH

Artz et al, Clin Orthop, 1975

Excessive femoral anteversion

Non constant

Animal experimentations don't demonstrate clearly this hypothesis

Smith et al, JBJS Am, 1963

Cahuzac et al, JPO, 1989

Wilkinson, JBJS Br, 1983

Excessive femoral anteversion is not a *primun movens*

However, it may be implied in the mechanic theory

Ligamentous hyperlaxity

→ Hyperlaxity (hormonal)

Wilkinson, JBJS Br, 1983

Suzuki et Yamamuro, Acta Orthop Scand, 1986

→ Inguinal hernia and CDH

Uden et Lindhagen, Acta Orthop Scand, 1988

→ Idiopathic familial hyperlaxity

~~Primum movens~~

Predisposing factor

2) Mechanical theory

Exogenous or mechanical factors

Browne, Arch Dis Child, 1955

Laurence, 1971

Dunn, Clin Orthop, 1976

a) Intra utero

Breech presentation
(knee extension = 20% CDH)

External rotation

Wilkinson, JBJS Br, 1983



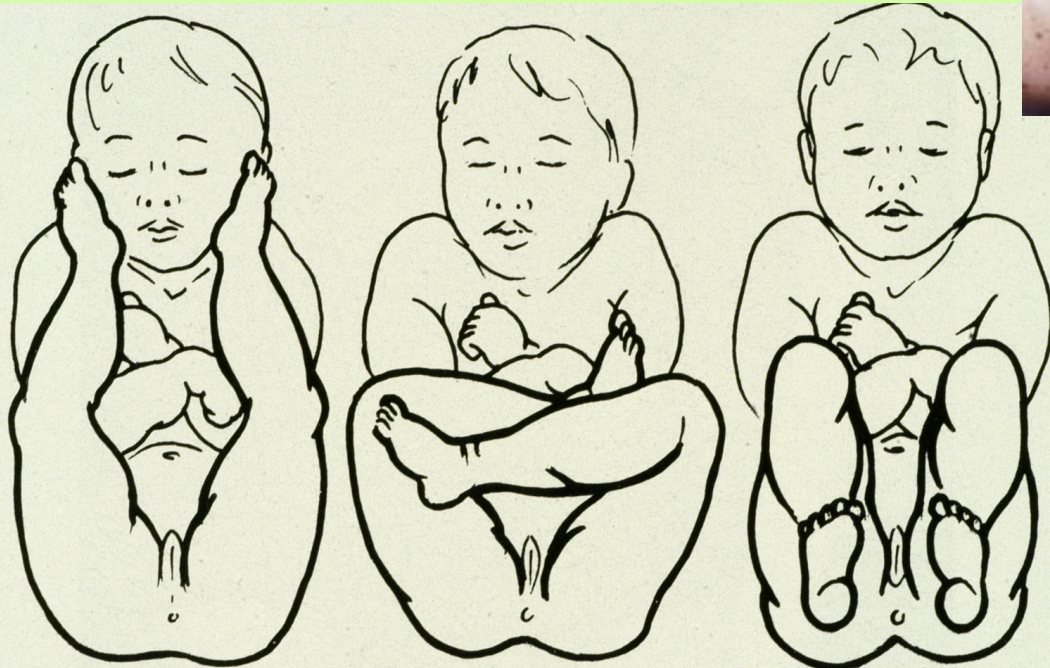
→ Harmstring hypotonic

→ Unstable hip :

External rotation : dislocation

Internal rotation : reduction

Seringe et al, Chir Ped, 1981



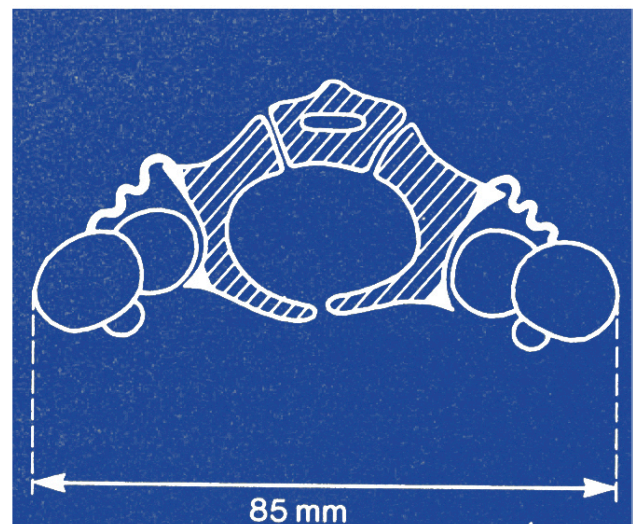
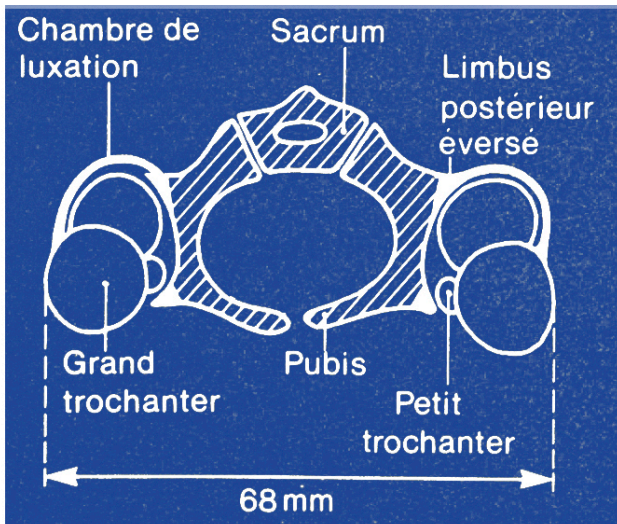
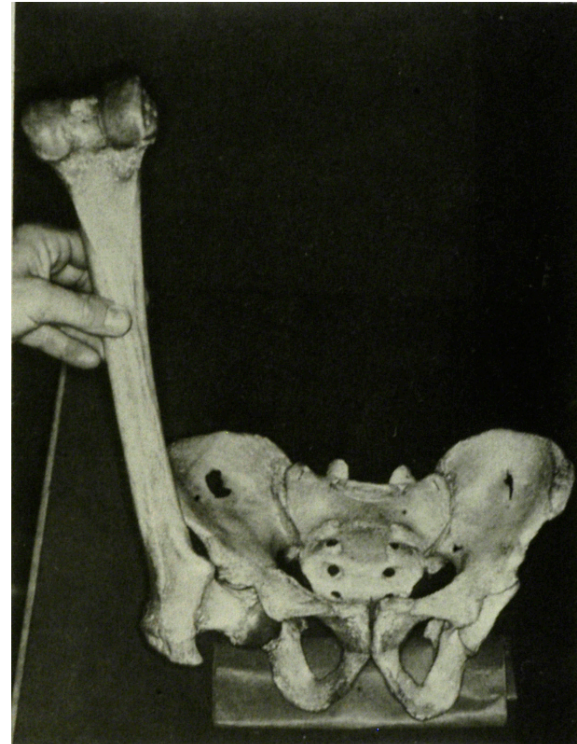
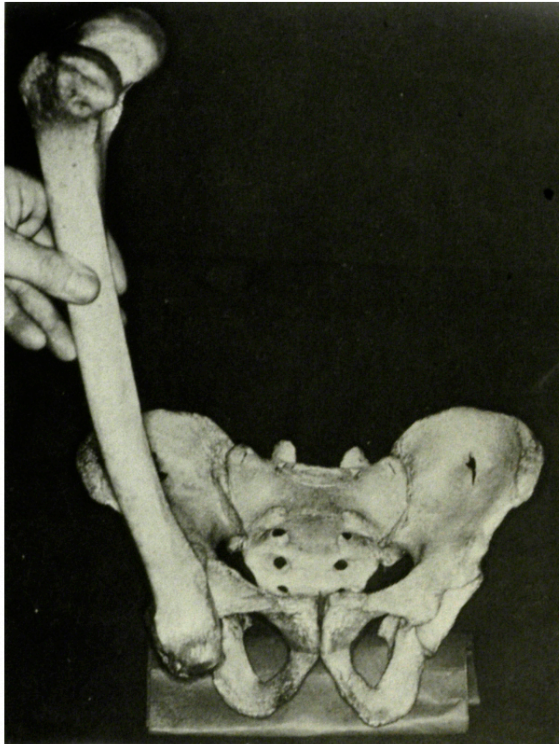
3 dislocating postures

Roser, Klin Chir, 1879

Wilkinson, JBJS Br, 1983

Seringe et al, Chir Ped, 1981

Anatomical study (*Seringe and Kharrat, Rev Chir Orthop, 1982*)



b) During delivery

~~Dislocation during delivery~~

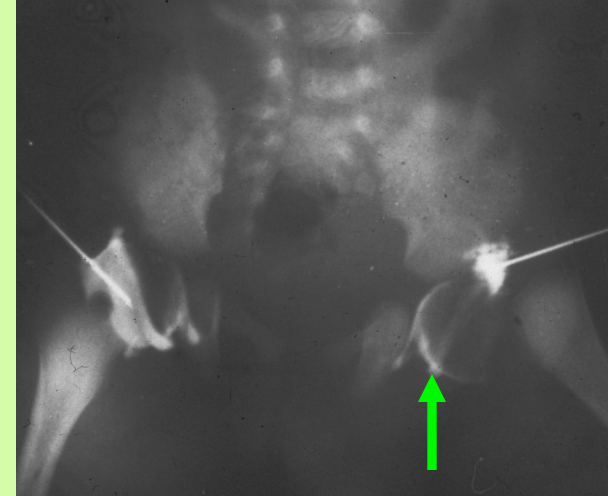
Normal hip at birth is perfectly stable

Dunn, Clin Orthop, 1976

Gardner, 1972

Walker, JBJS Am, 1980

Seringe and Kharrat, Rev Chir Orthop, 1982



~~Dislocation secondary to repeated clinical examination~~

Hjelmstedt and Asplund, J Pediatr Orthop, 1983

c) Post-natal factors

**At least, half of unstable hips
will heal spontaneously after delivery**

Barlow, JBJS Br, 1962

Seringe et al, Rev Chir Orthop, 1989

Adducted/Extended hips swaddle

=> **High rate of CDH**

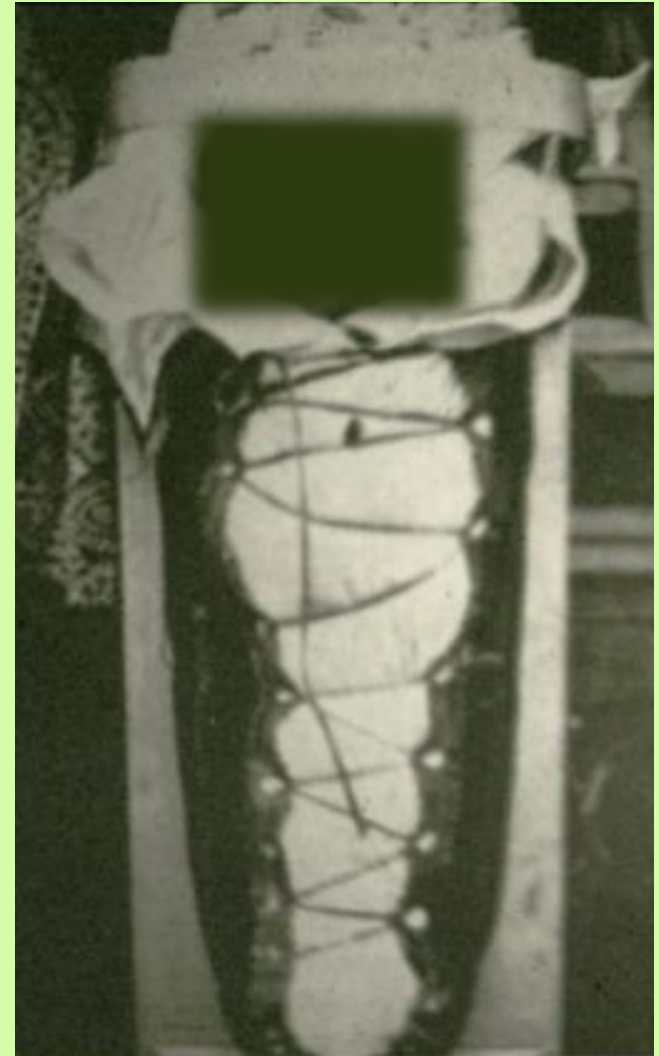
Rabin and al, Am J Publ Health, 1965

Salter, Can Med Ass, 1968

Coleman, Clin Orthop, 1968



**Manitoba indian's swaddle
goes against
spontaneous reduction of CDH**



Low rate of CDH with african swaddle (abducted/flexed hips)

Skirving et Scadden, JBJS, 1979



**African swaddle promotes
spontaneous reduction of CDH**

Theory of pathogeny

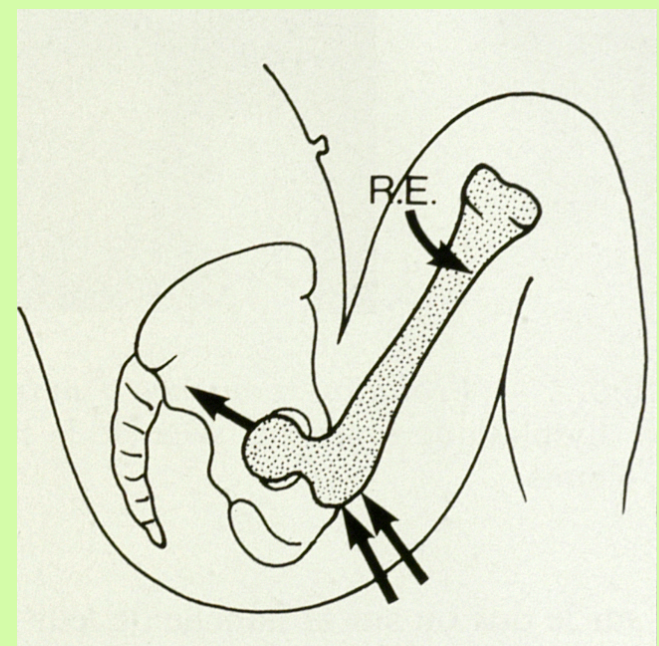
How to produce an hip dislocation ?

Dislocating posture

- External rotation and/or hyper-anteversion
- Adduction
- Hyper-flexion (posterior dislocation)

Force of dislocation

- Pressure on the great trochanter



Pathogeny of CDH

Genetic factors

Non constant

Predisposition

→ Hyperlaxity

→ Acetabular dysmorpby

Exogenous factors (mechanical)

Determining

At birth : Dislocated/dislocatable hip

Spontaneous improvement 60% No improvement 40%

Complete
Normal hip

Incomplete

Acetabular dysplasia

Minor subluxation

Severe subluxation
Dislocation

What about delayed diagnosis of hip dysplasia
after negative early screening

Developmental hip dysplasia ?

False negative of screening ?

