

Osteotomies for Hip Dysplasia from 18 Months of Age to Skeletal Maturity

John H. Wedge

Zurich 2011

Orthopedics Update
« Die Kindes hüfte »
24. November 2011

**The treatment of DDH is
based on 3 broad principles
in this age group.**

Principle #1

**Hip dysplasia encompasses
a wide spectrum of
deformity.**

Principle #2

**Decision-making for the timing
of surgical intervention must
be based on knowledge of the
natural history of the various
manifestations of hip
dysplasia.**

Principle #3

The specific osteotomy or osteotomies required are determined by the extent, location, and nature of the anatomic deformity in the acetabulum or proximal femur.





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2YR

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Face No cut

IV 24.6 cm

V5

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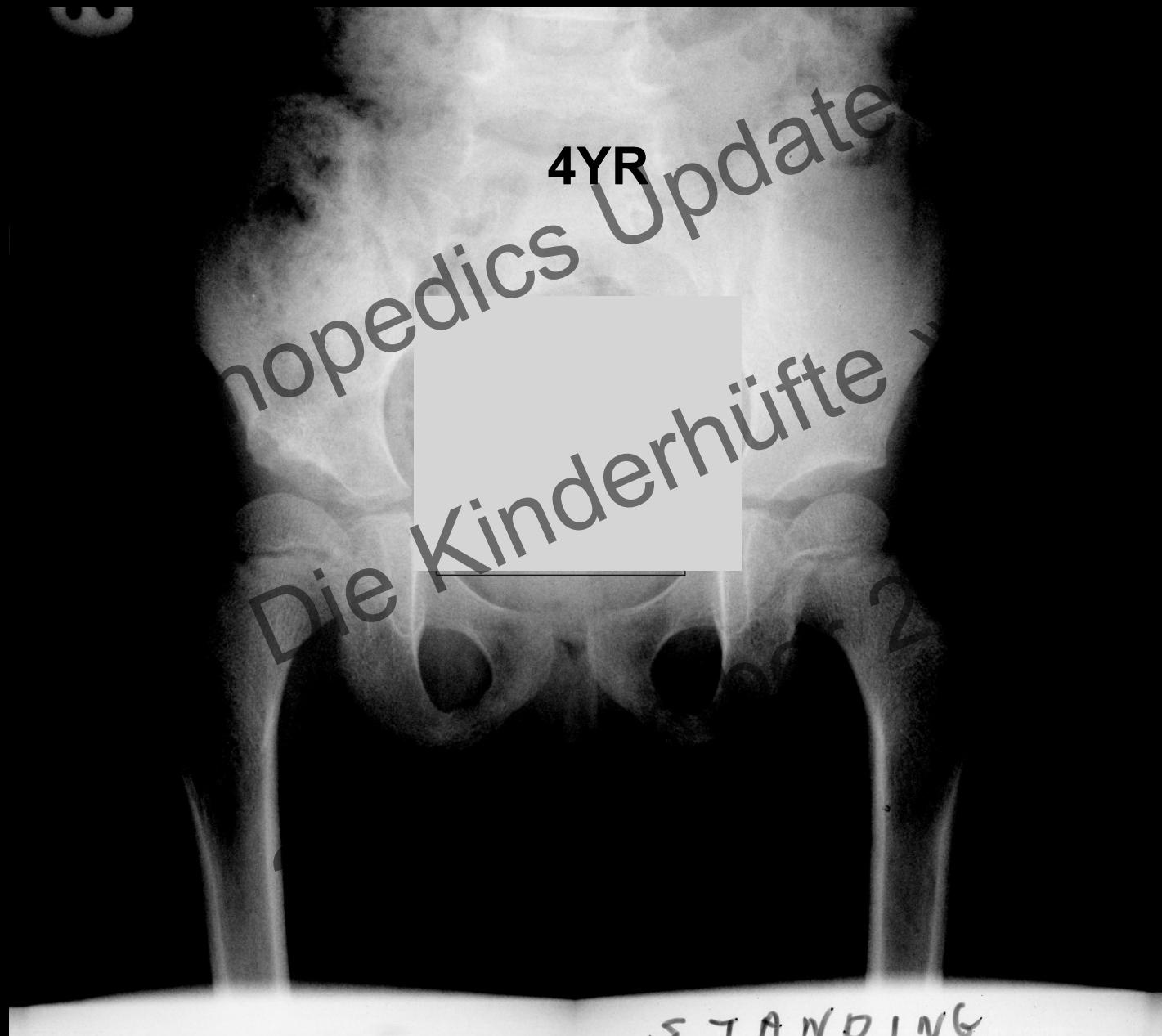
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Principle #2

**Decision-making for the timing
of surgical intervention must
be based on knowledge of the
natural history of the various
manifestations of hip
dysplasia.**

Treatment of Acetabular Dysplasia (AD)

- Primary or residual following treatment
- Determine (predict) congruency
- Subluxation vs. dysplasia
- Intervention vs. observation

15M

19M

27M

36M

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42M

48M

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54M

5YR

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Guide to Timing of Intervention in Acetabular Dysplasia

- History (limp worsening)
- Physical Exam (muscle wasting, tight adductor, LLD)
- Failure of improvement (reduction) of Acetabular Index (AI) over time (6-9 month interval)
- Decrease in centre-edge angle
- Widening of acetabular tear-drop (U-figure)

14M

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4YR

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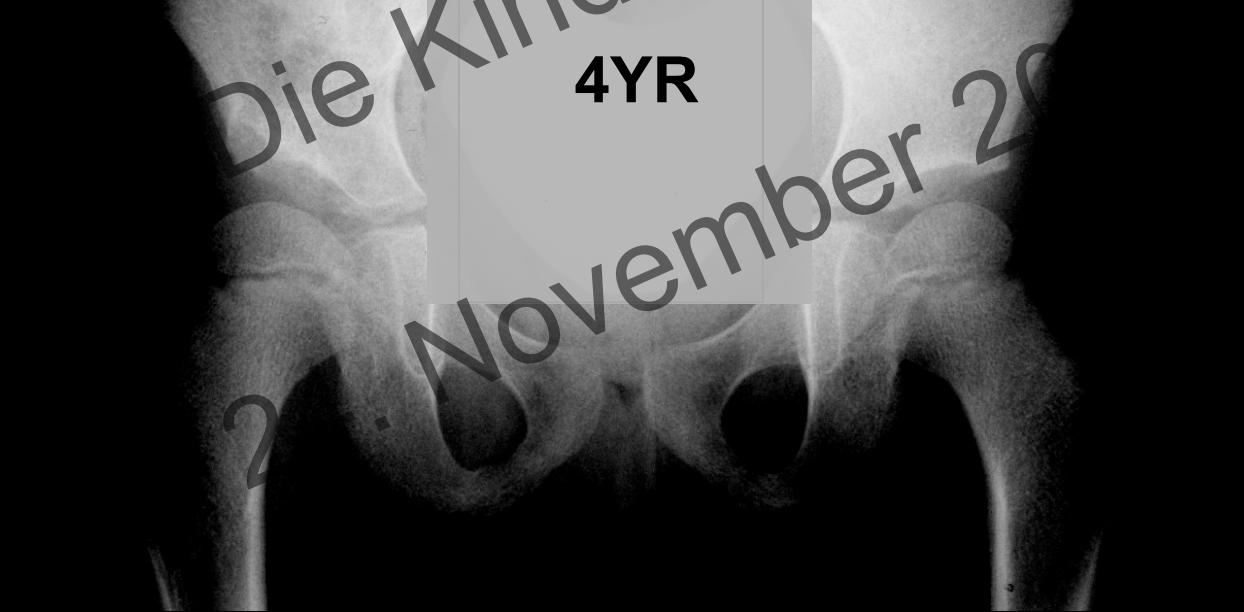
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14YR

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Principle #3

The specific osteotomy or osteotomies required are determined by the extent, location and nature of the anatomic deformity in the acetabulum or proximal femur.

Selection of Type of Pelvic Osteotomy

Depends on:

- Congruency between the femoral head and acetabulum
- Shape and contour of the acetabular roof
- Amount and location of redirection of the acetabulum required

Types of Pelvic Osteotomies

- **Redirectional - single (Salter), triple (Steele,Tonnis), or periacetabular (Ganz):**
 - indicated where acetabular roof is well formed and the hip joint congruent
- **Acetabular volume altering (AVA) (Pemberton, Dega):**
 - indicated where congruency cannot be achieved and there is a steeply sloping acetabular roof



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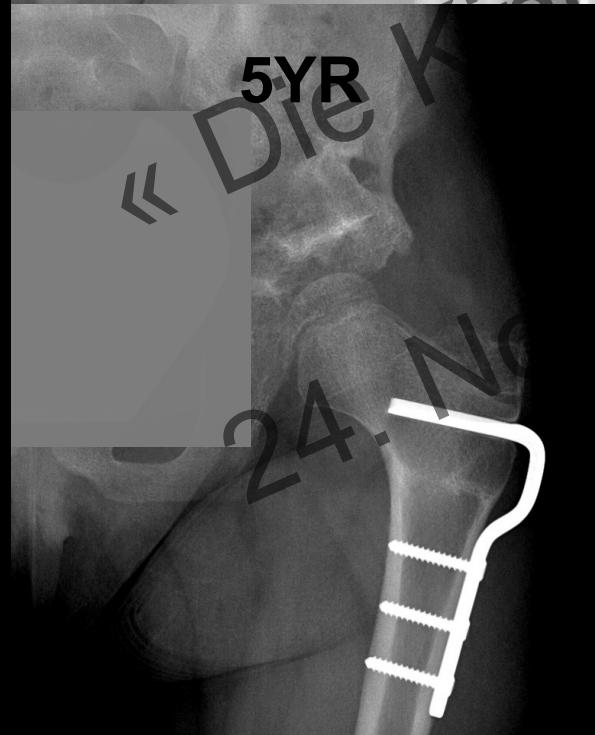
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4.5YR



Treatment of Dislocation

- Natural history and type of dislocation determine upper age limit for reduction
- Iatrogenic osteonecrosis (ON) leads to earlier need for arthroplasty than untreated dislocation
- After 18 months of age, rate of ON less with open vs. closed reduction

Treatment of Dislocation (cont'd)

- Femoral shortening osteotomy is necessary after 30 months of age in grade 4 dislocation (major proximal displacement of femoral head)
- My age limit for reduction is 6 years in bilateral dislocation and 10 years for unilateral dislocation, but modified by type of dislocation

A black and white radiograph of a child's pelvis. The text "2 yrs." is printed in the upper right corner of the image.

2 yrs.

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A black and white radiograph of a child's pelvis. The text "3 yrs." is printed in the upper left corner of the image.

3 yrs.

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36YR



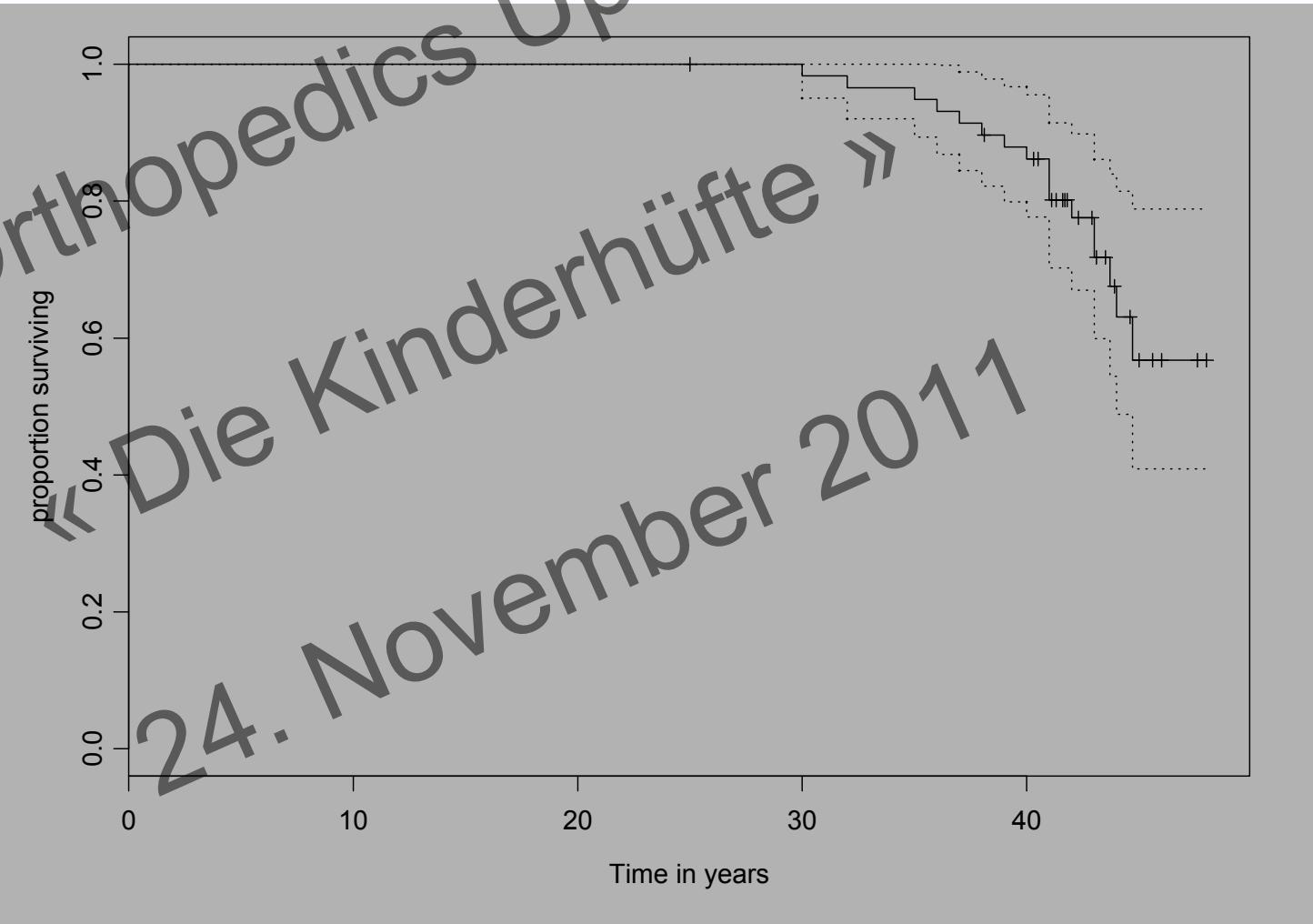
Outcome at 45 years of open reduction and innominate osteotomy for late presenting developmental hip dislocation

Simon Thomas
John Wedge
Robert Salter

The Hospital for Sick Children
Toronto, Canada

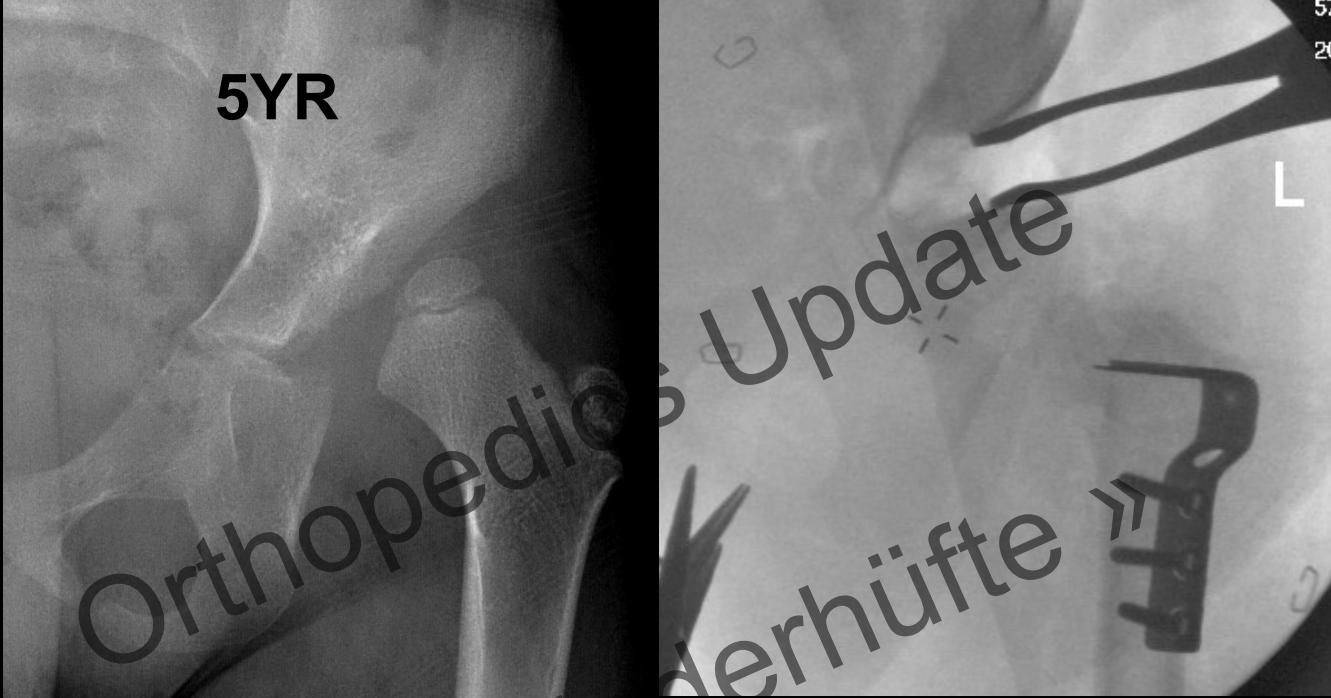


Kaplan Meier Survival Analysis (Hip Replacement)





5YR





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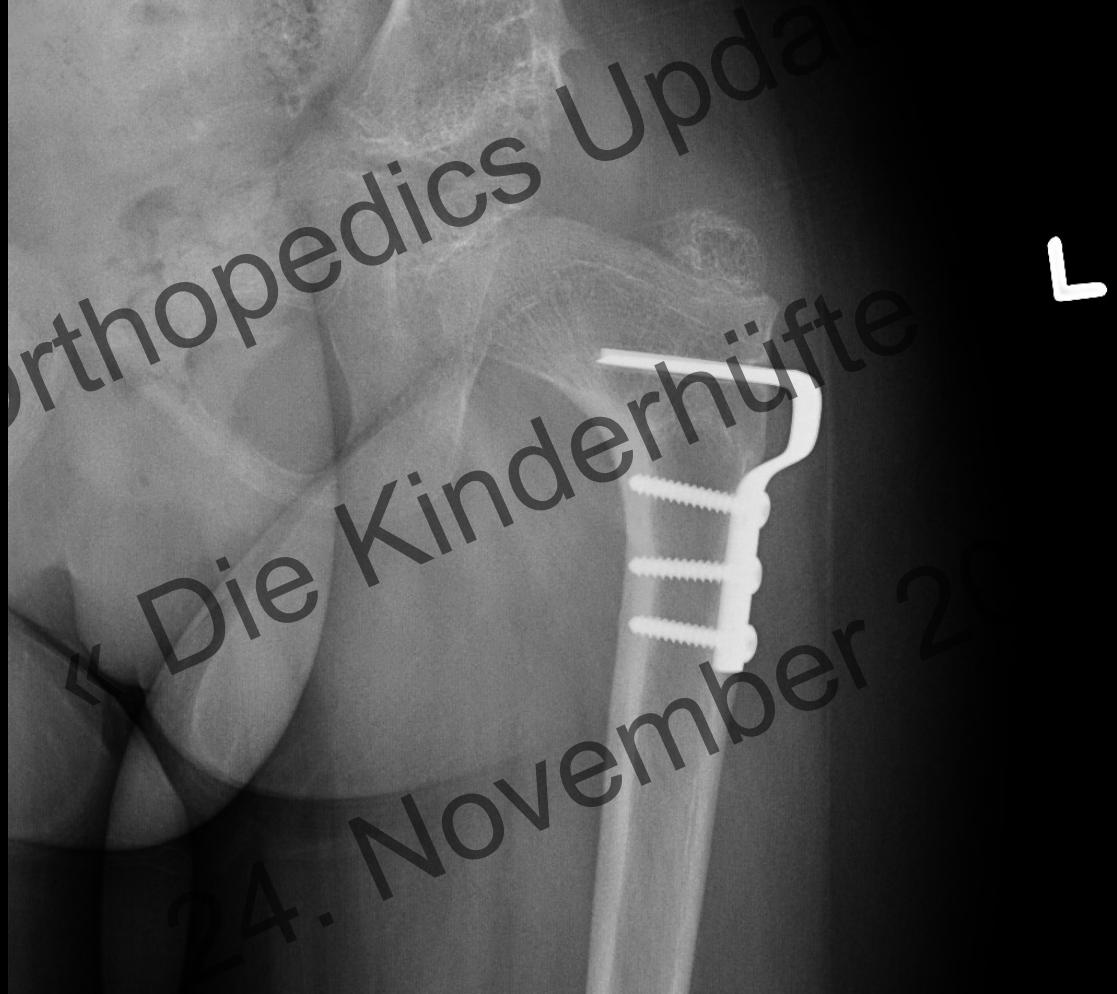
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A black and white radiograph of a child's pelvis. The femoral heads are centered within the acetabula. A large, semi-transparent circular watermark is positioned in the center of the image, containing the text "Die Kinderhüfte".

7YR

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September 2011

2YR

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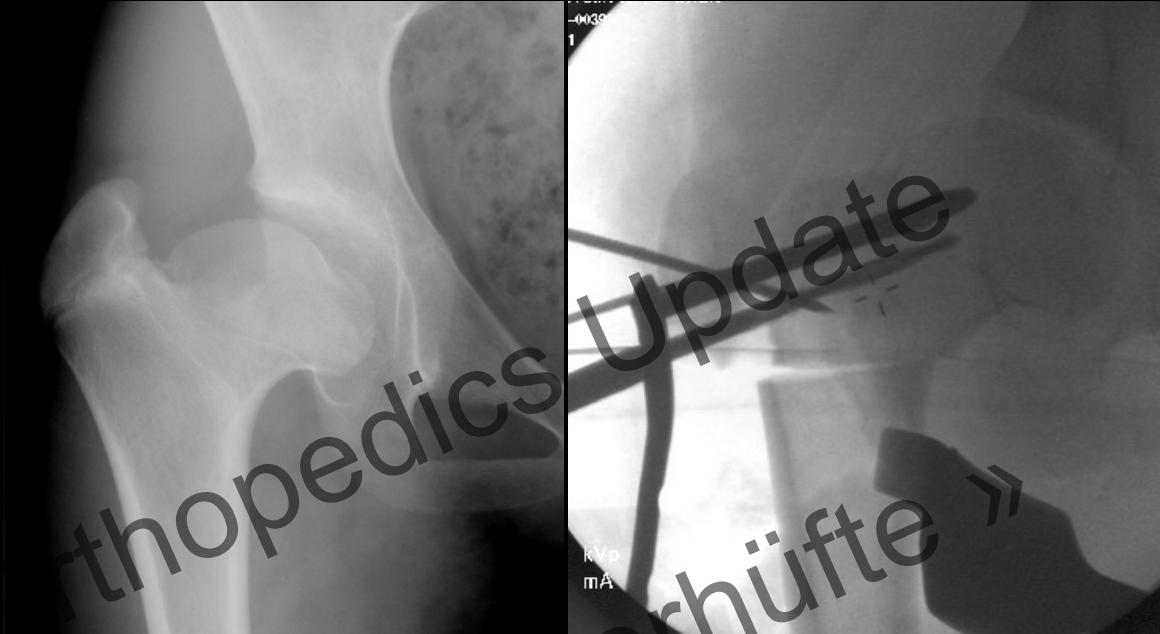
Deformity of the Proximal Femur

- Almost always requires correction after 30 months of age
- Important to distinguish between excessive anteversion and valgus (tendency is to overcorrect)

Deformity of the Proximal Femur (cont'd)

- **Medial flattening of femoral head (epiphyseal and metaphyseal) is a sign of a poor prognosis**
- **Proximal femoral deformity seen in late childhood is predominantly due to growth deformity from osteonecrosis**





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Summary

- DDH presents with a range of deformity requiring different osteotomies (P #1)
- Under carefully controlled circumstances, hips may be observed for spontaneous correction of bony deformity (P #2)

Summary (cont'd)

- Pelvic osteotomies are not often interchangeable as each has specific indications (P #3)
- 50% of hips (>30-36 months) will require a femoral osteotomy as well to ensure lasting correction of deformity

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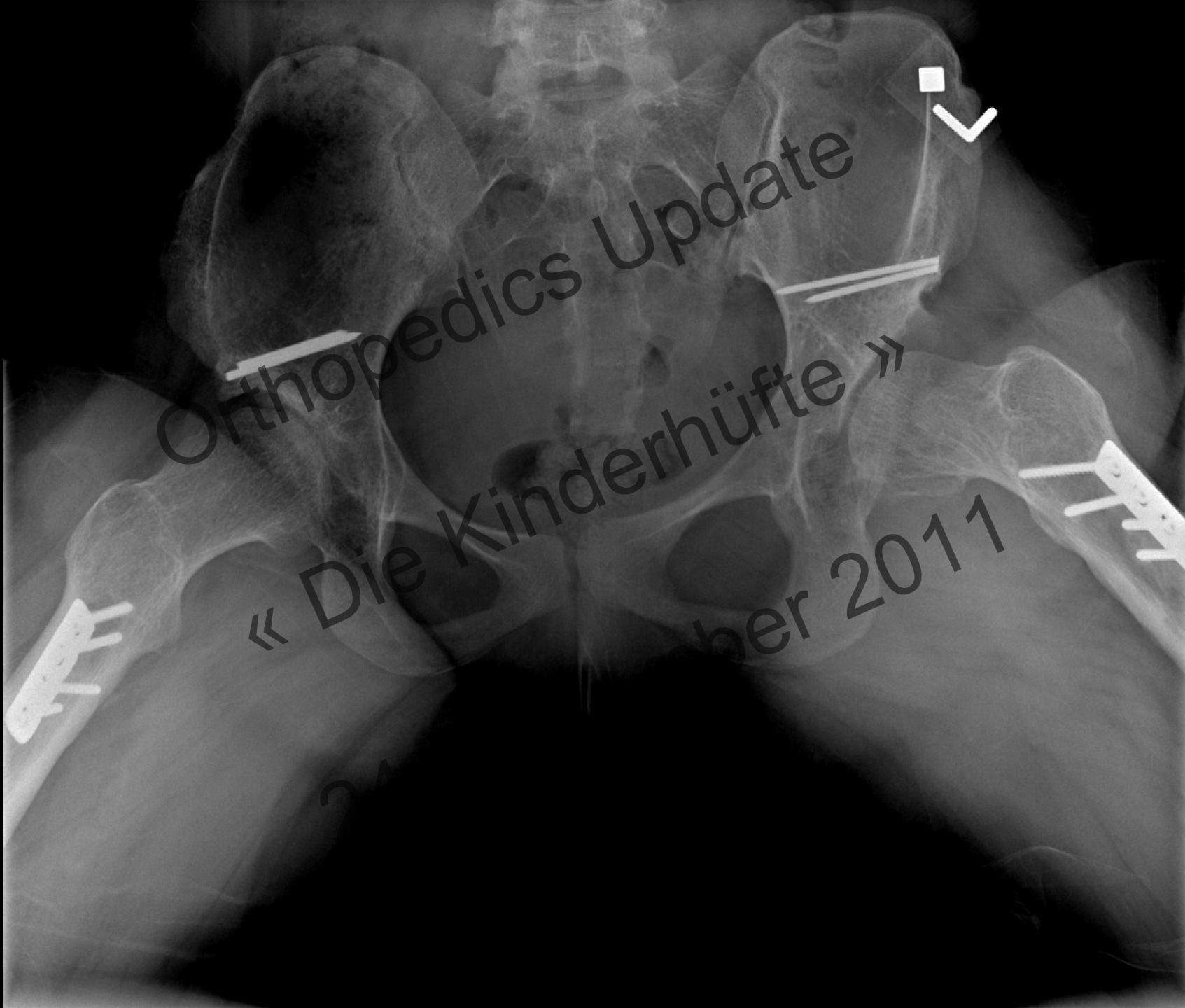
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