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

John H. Wedge

Zurich 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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24. November 2011

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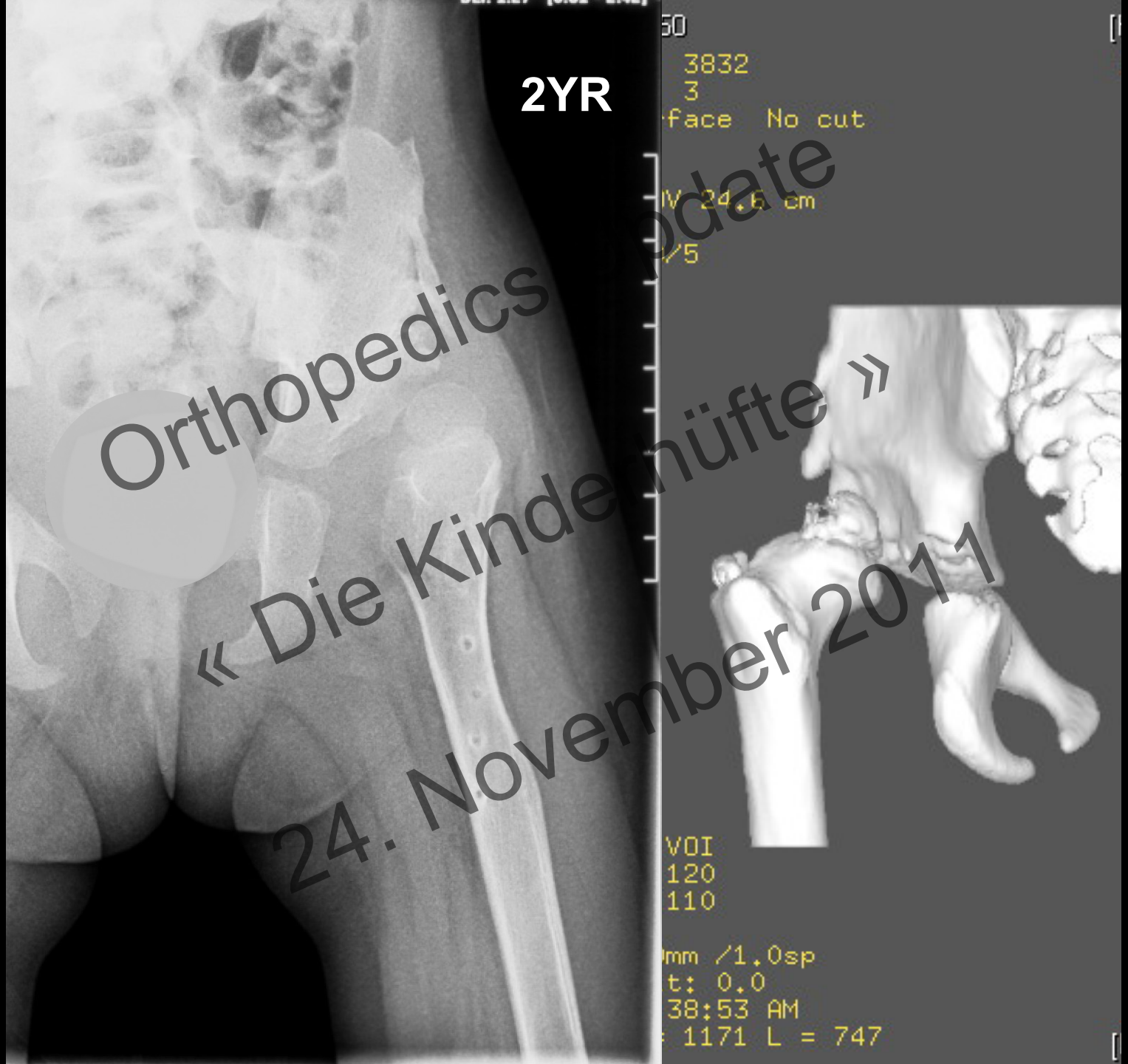

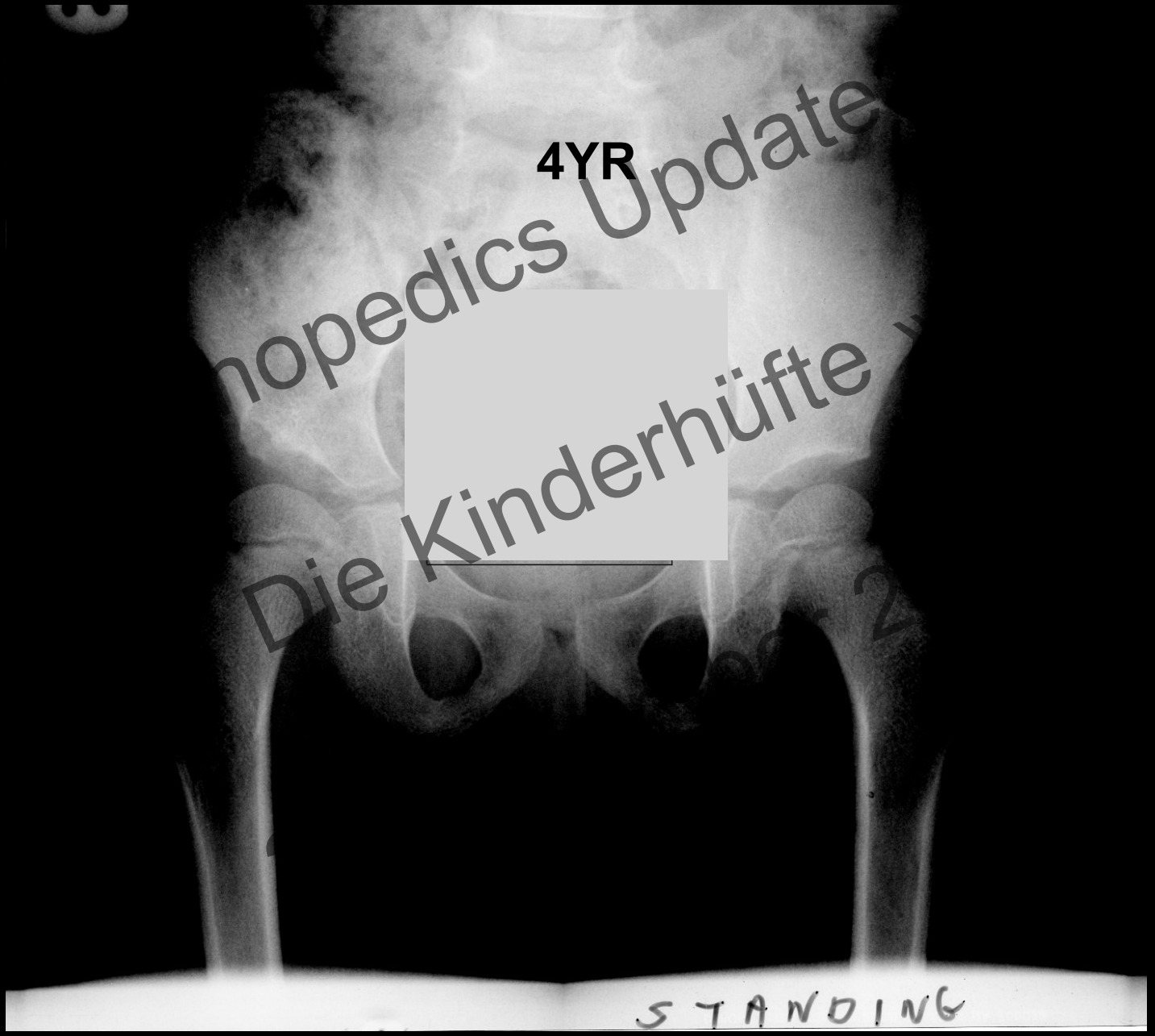


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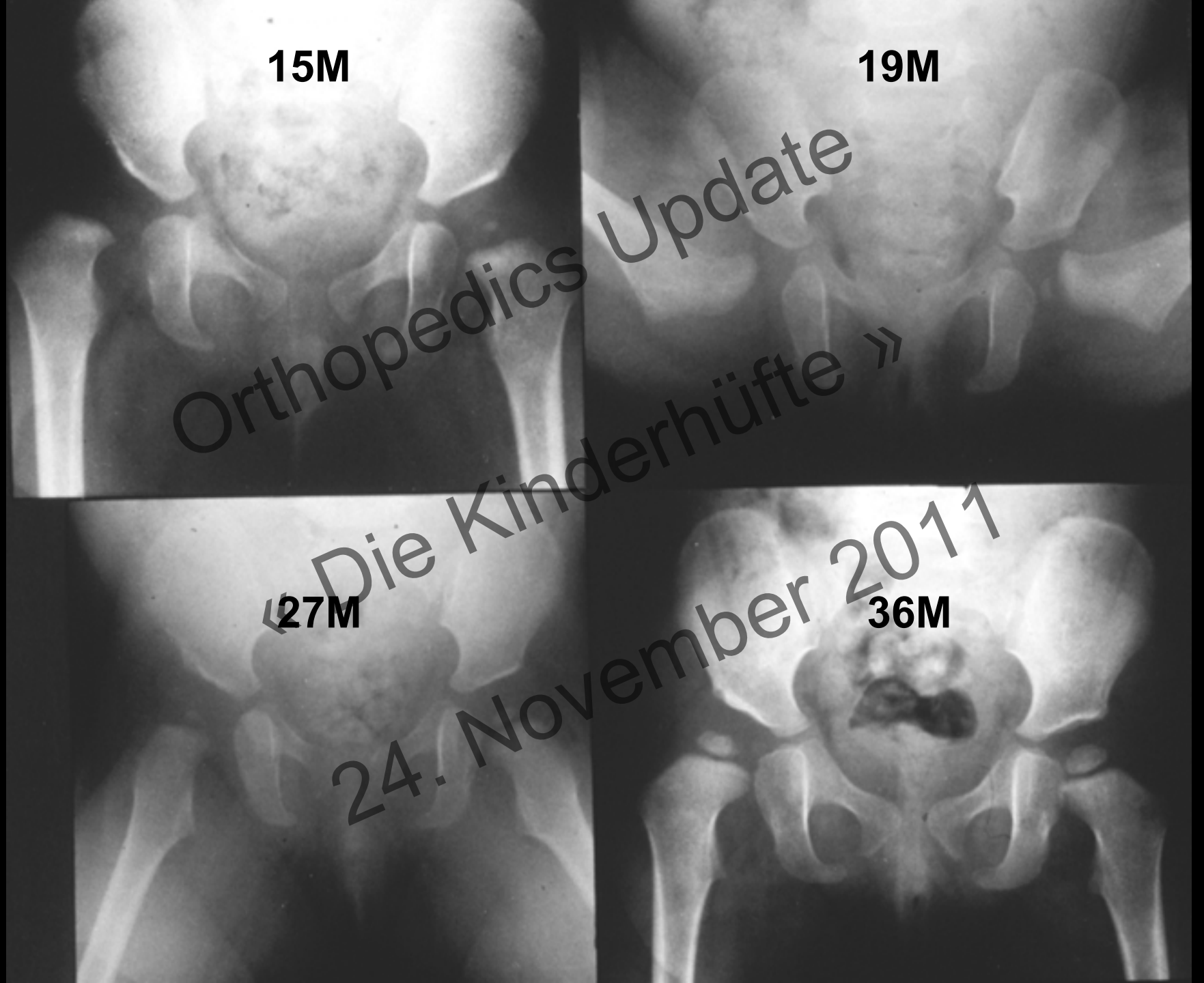
« Die Kinderhüfte »
24. November 2011

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



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)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« Die Kinderhüfte »
24. November 201

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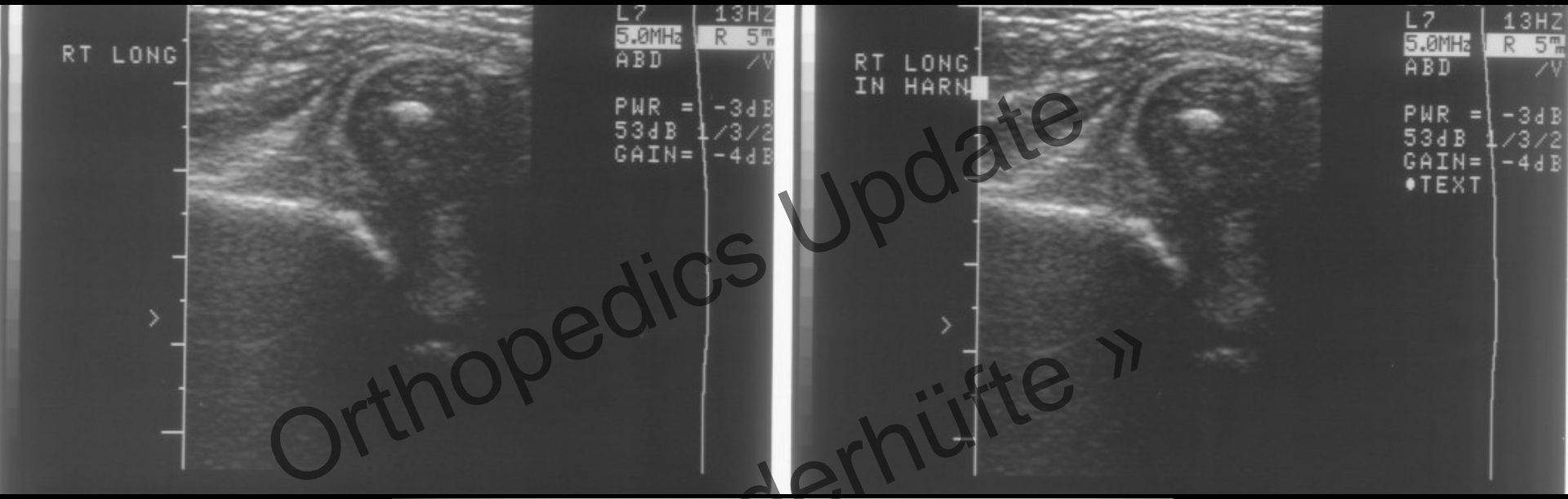

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Principle #3

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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« Die Kinderhüfte »

24. November 2011

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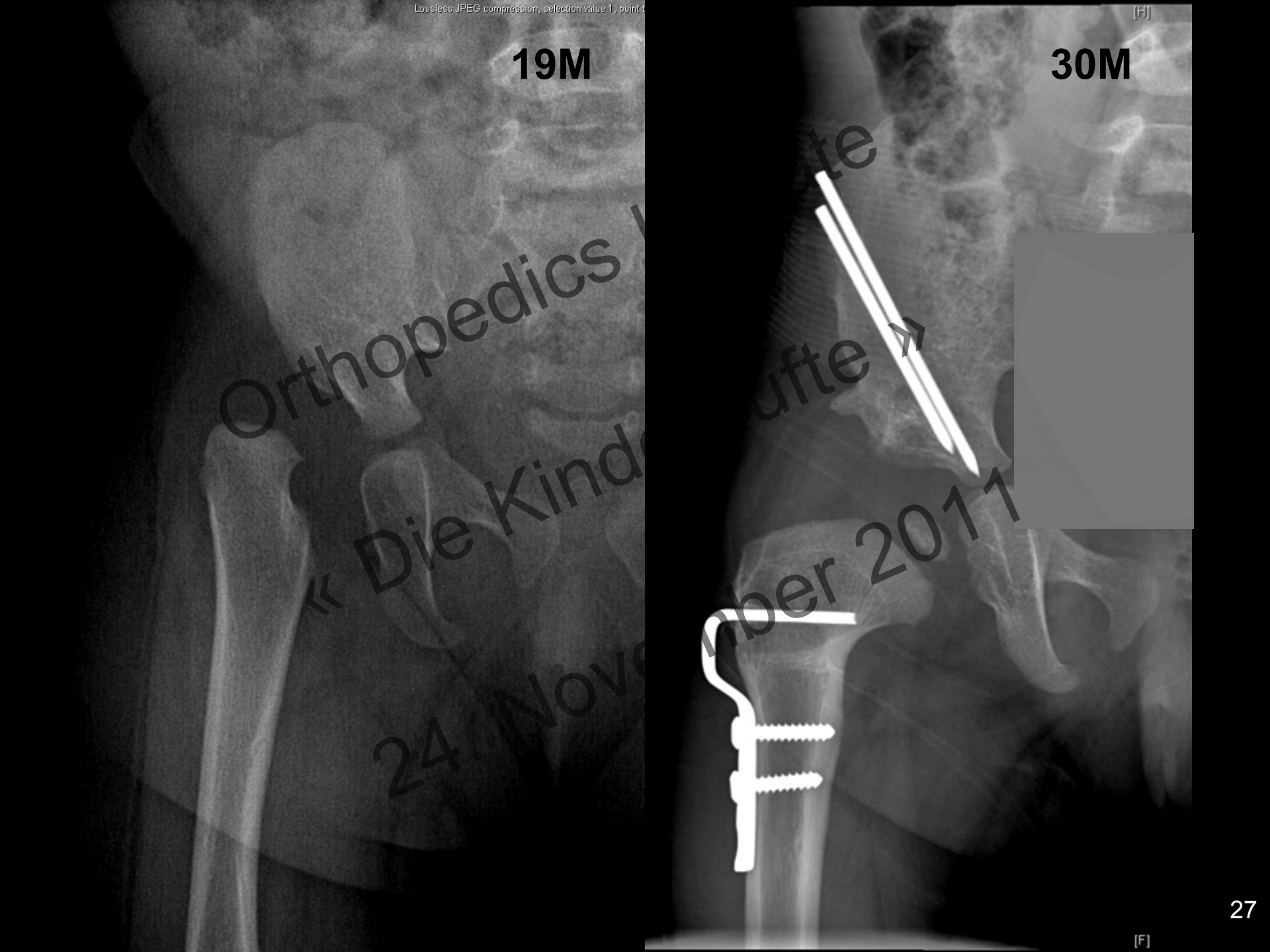


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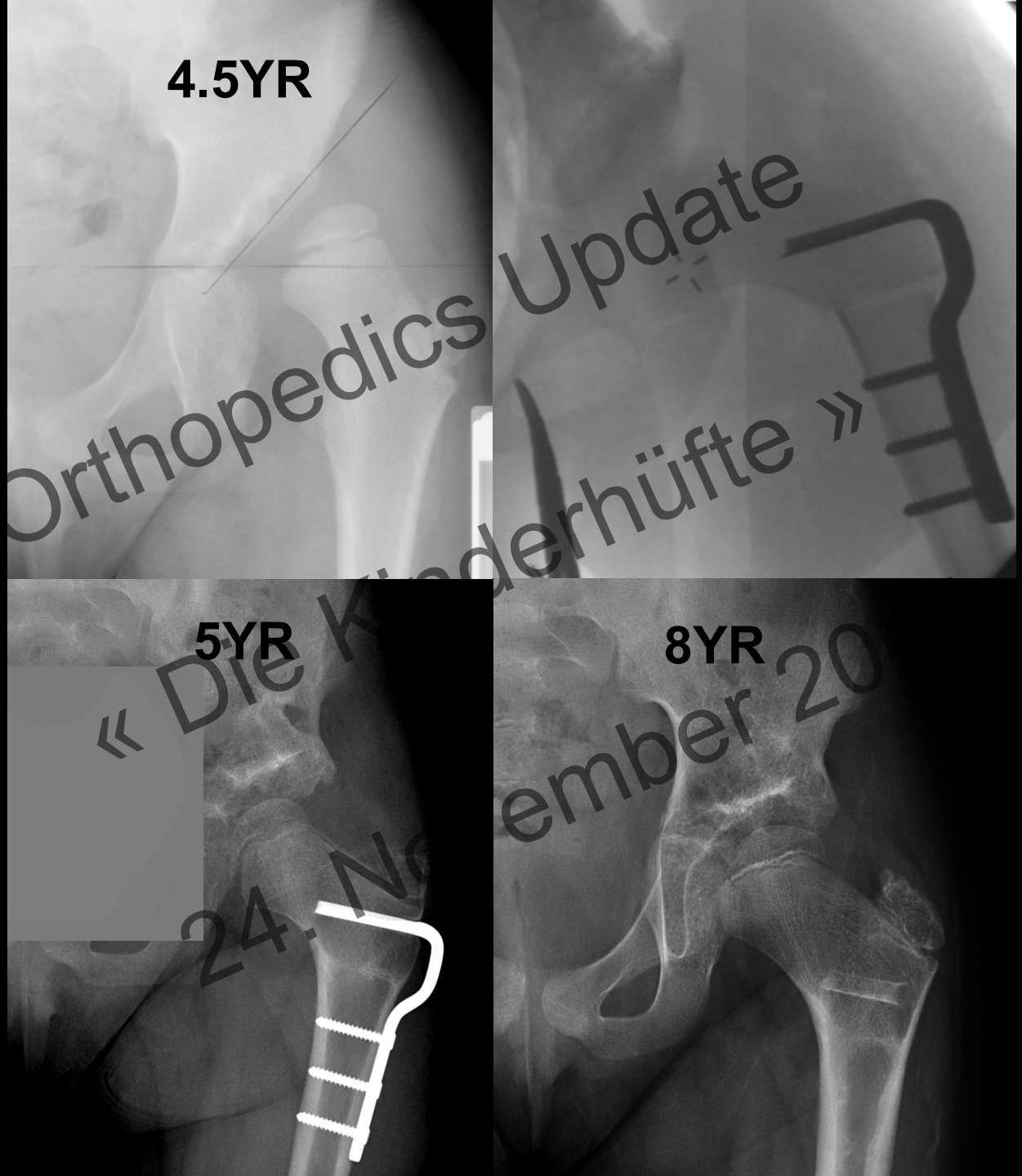
« Die Kinderhüfte »
24. November 2011



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

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« Die Kinderhüfte »

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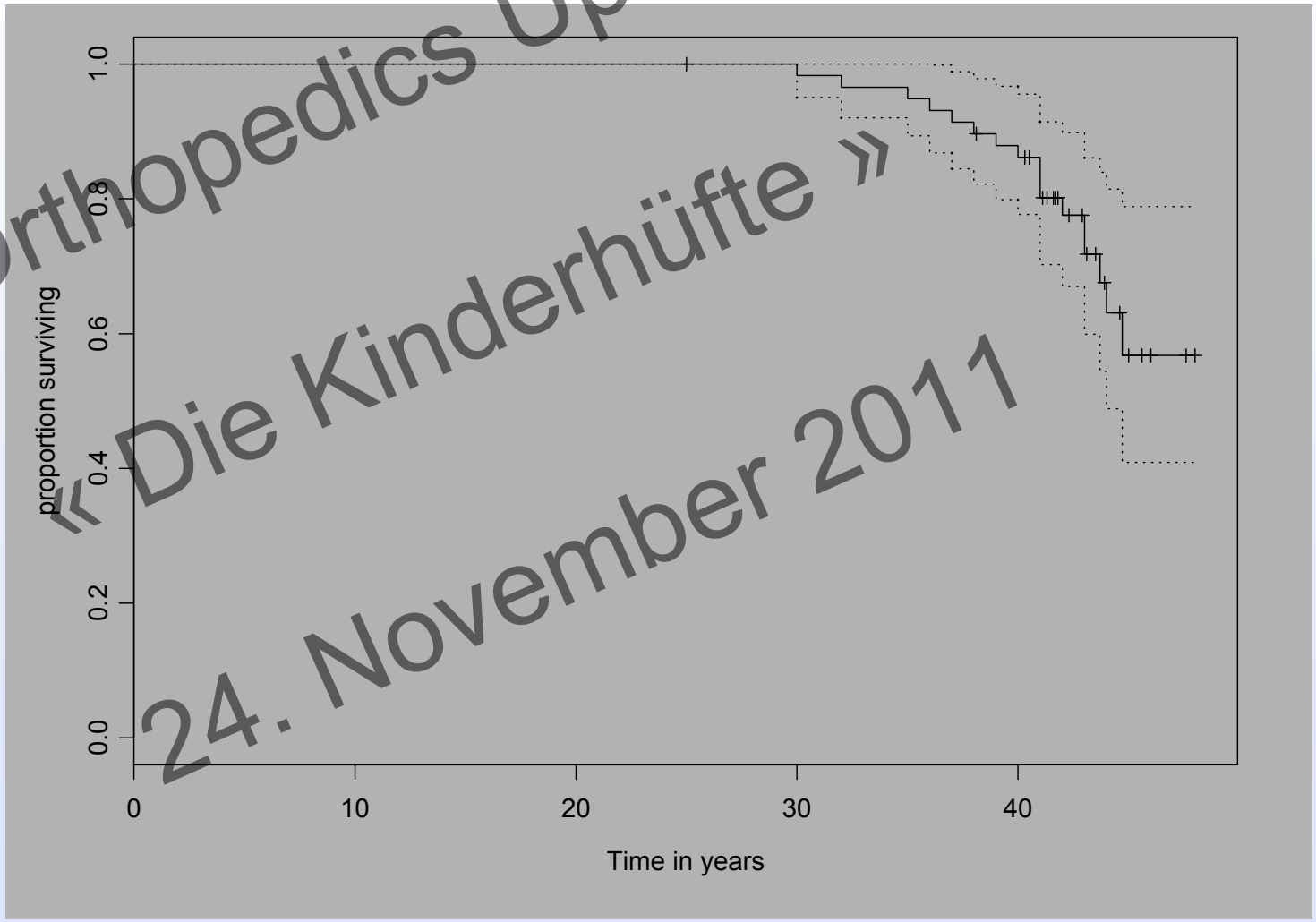
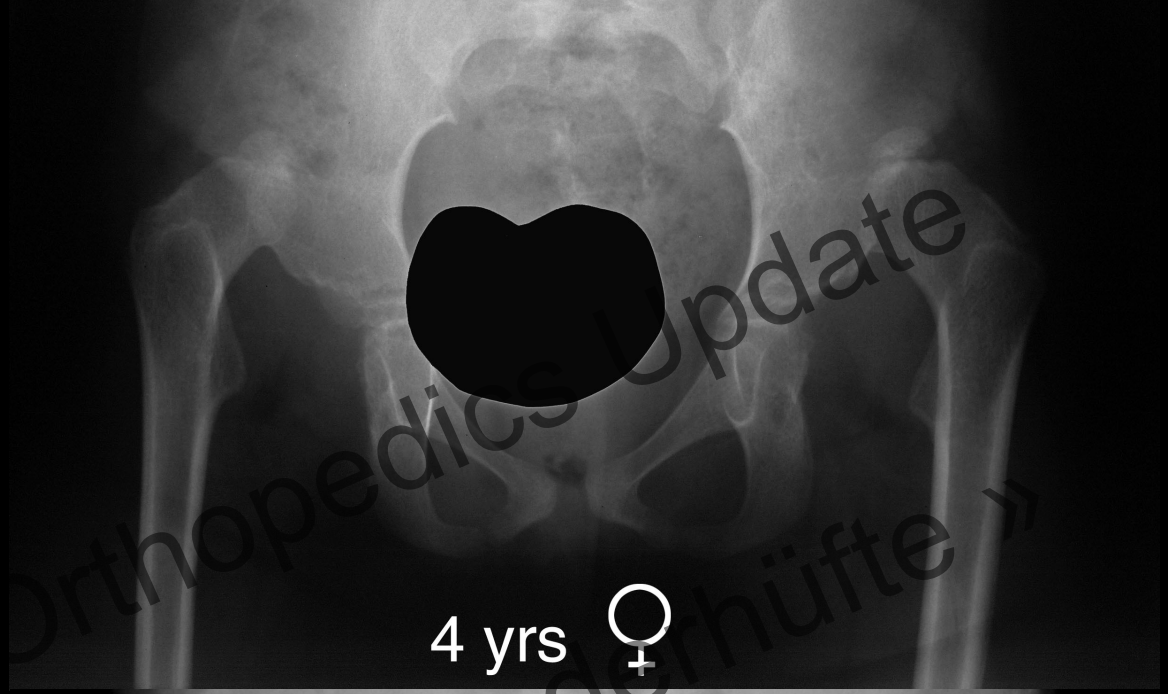
Outcome at 45 years of open reduction and innominate osteotomy for late presenting developmental hip dislocation

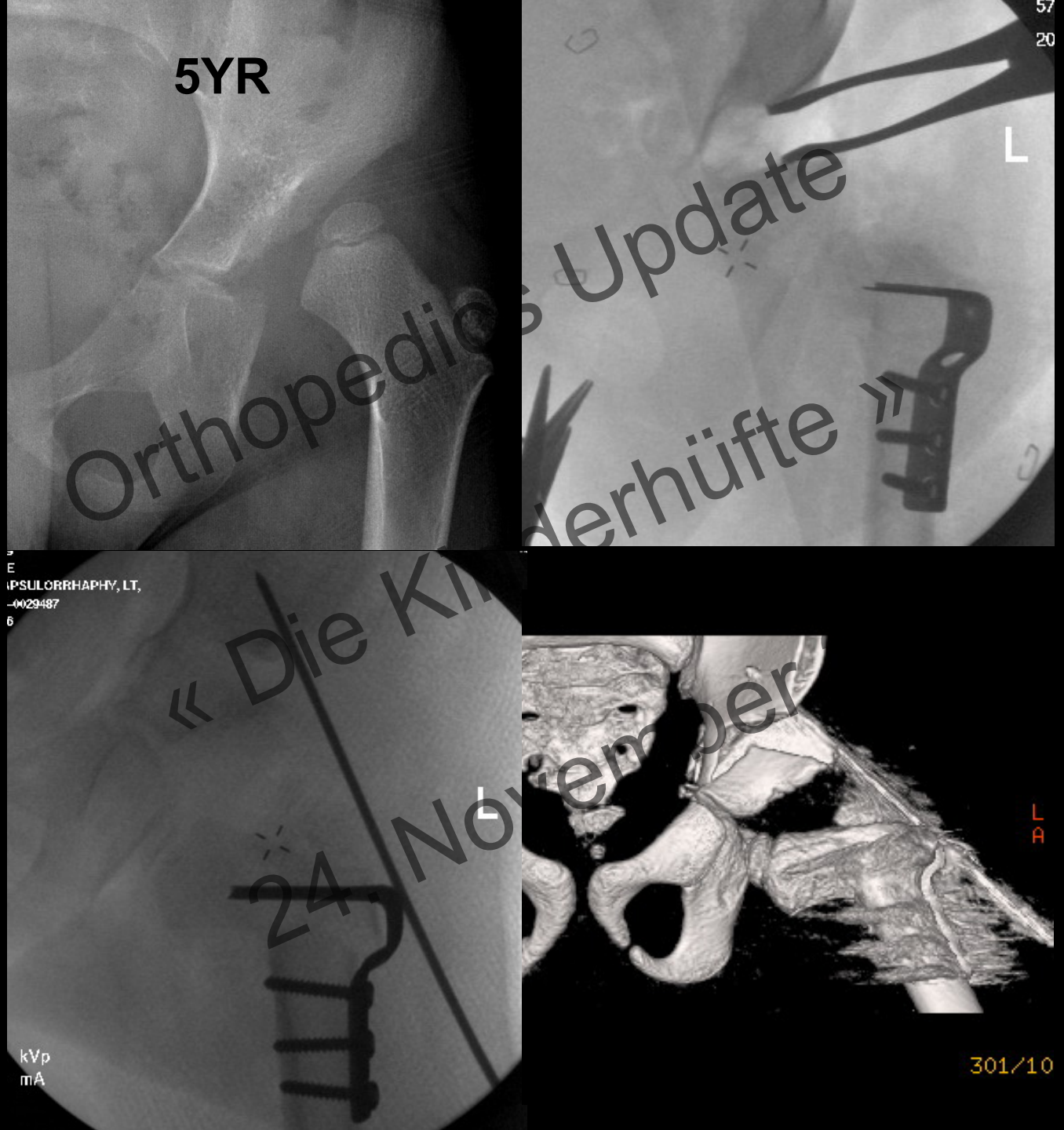
Simon Thomas
John Wedge
Robert Salter

The Hospital for Sick Children
Toronto, Canada

Kaplan Meier Survival Analysis (Hip Replacement)





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24. November 2011
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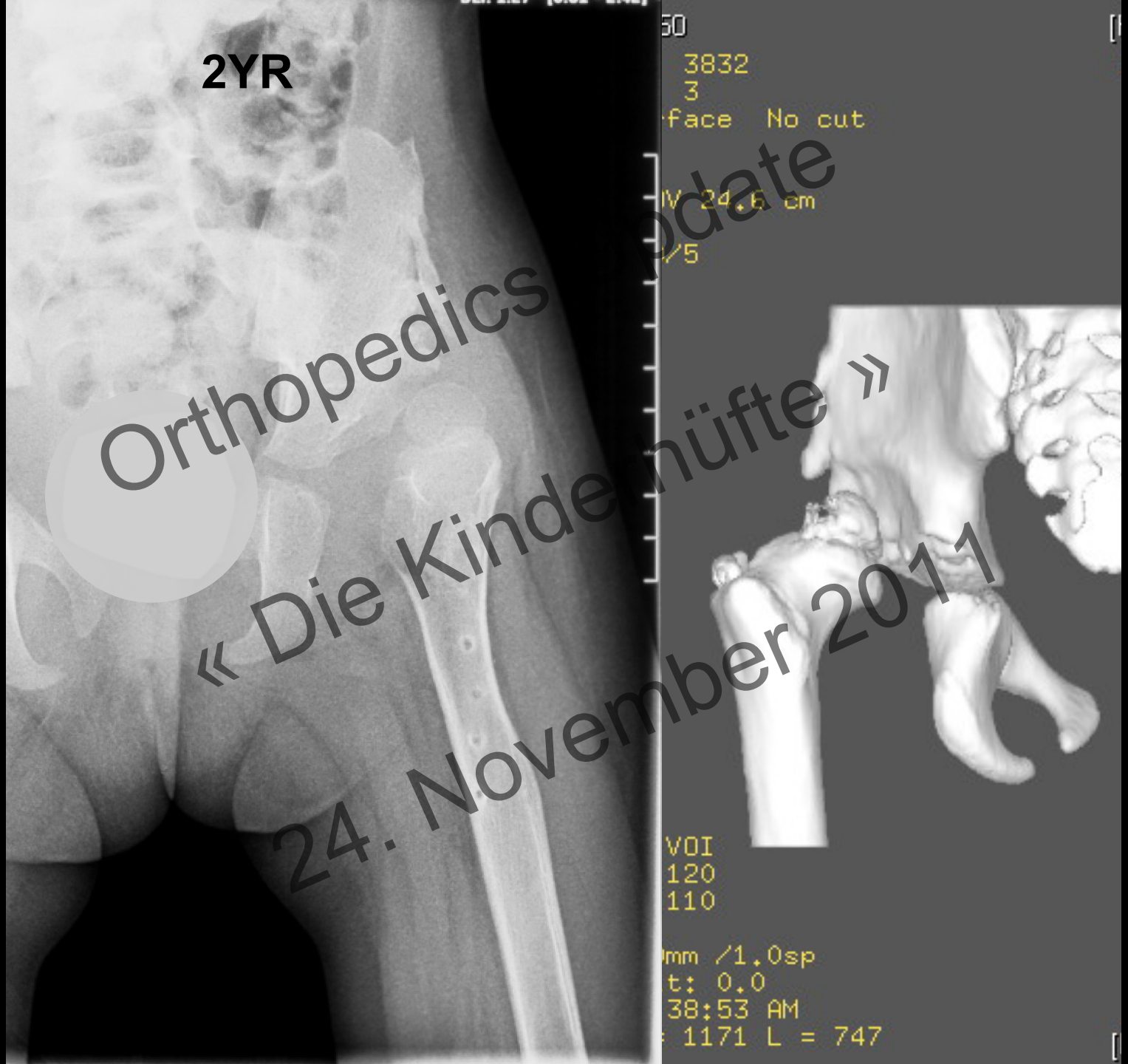

Deformity of the Proximal Femur

- 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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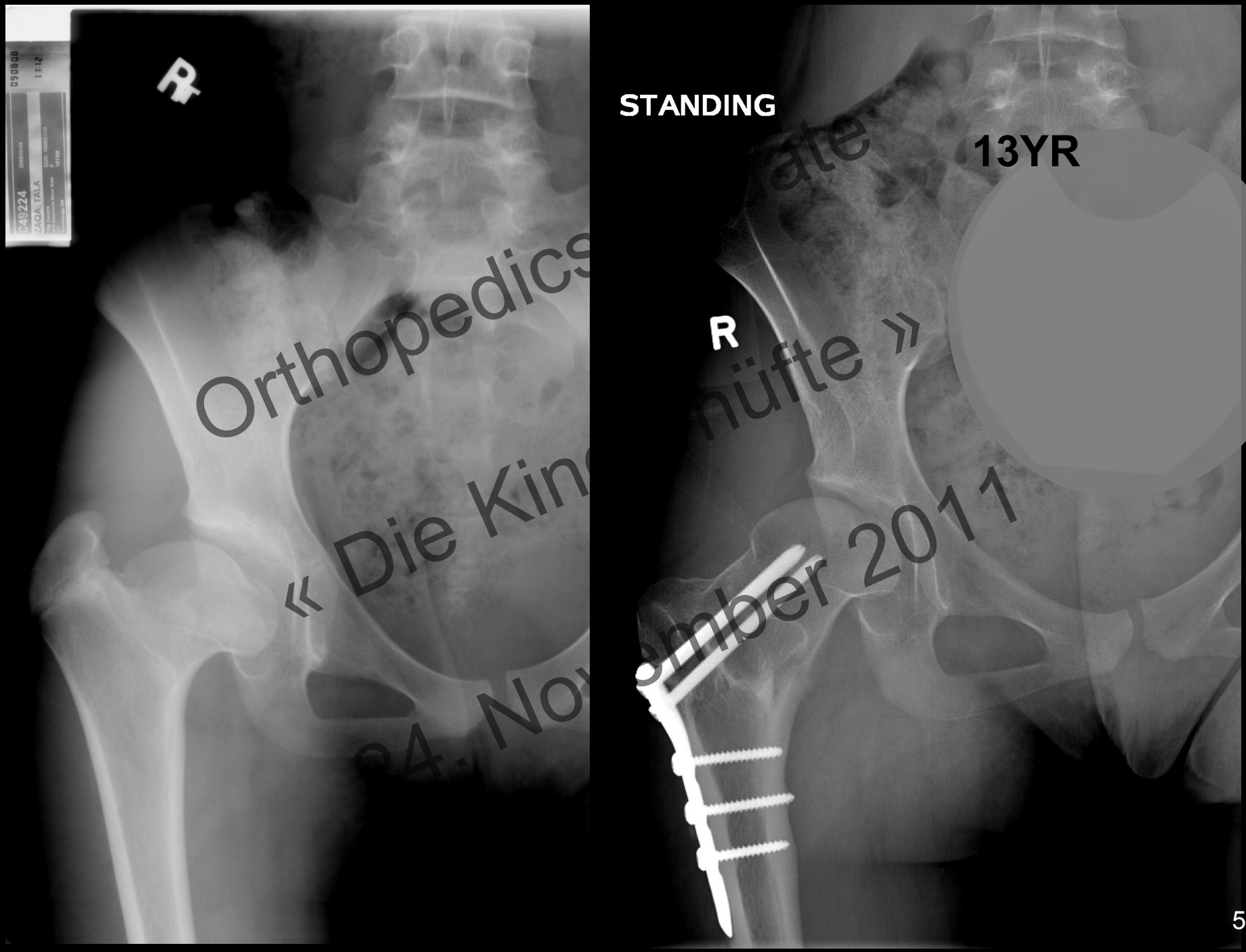

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Summary

- 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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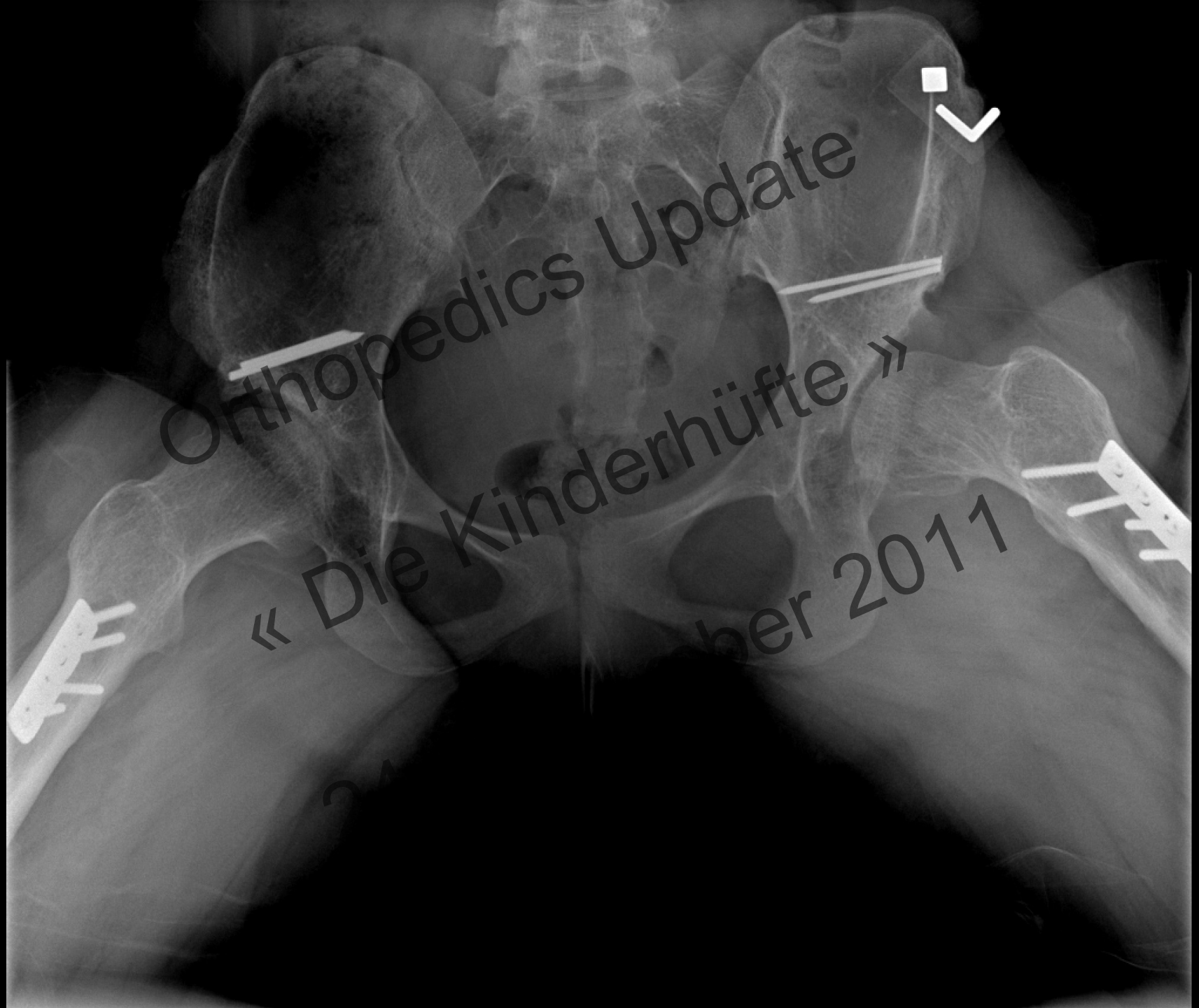
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