

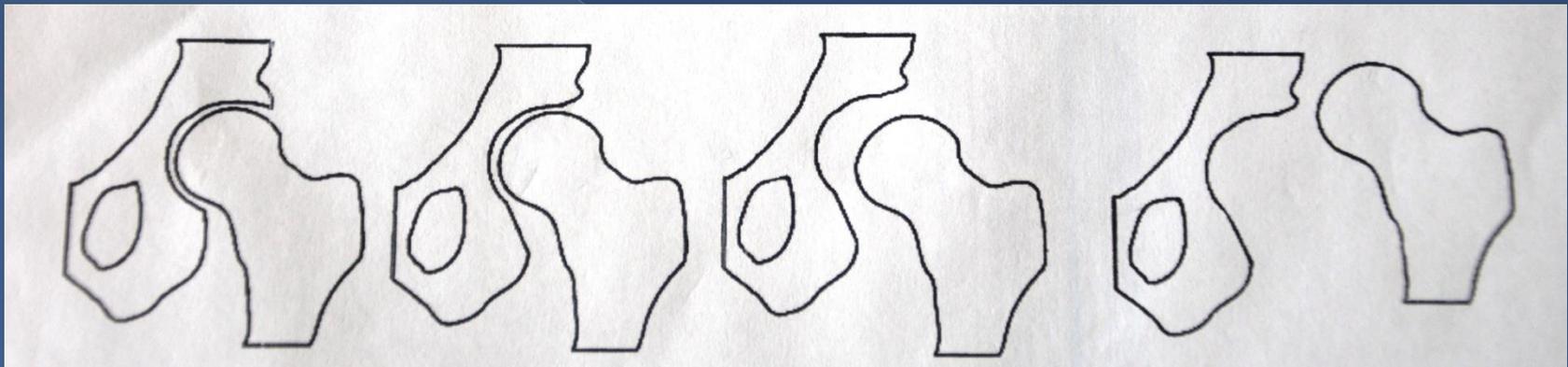
Janusz Popko
(Department of Paediatric Orthopaedics
Medical University of Białystok)

Prophylaxis of osteoarthritis of the hip in early infancy

**5 - 10 % of all total hip
replacements are due to
hip dysplasia**

Infantile DDH. HS Hosalkar, SJ Mubarak, EL Sink,
K.Mulpuri, CT Price

- The term developmental dysplasia of the hip (DDH) describes the whole range of deformities involving the growing hip including: frank dislocation, subluxation and instability



A

B

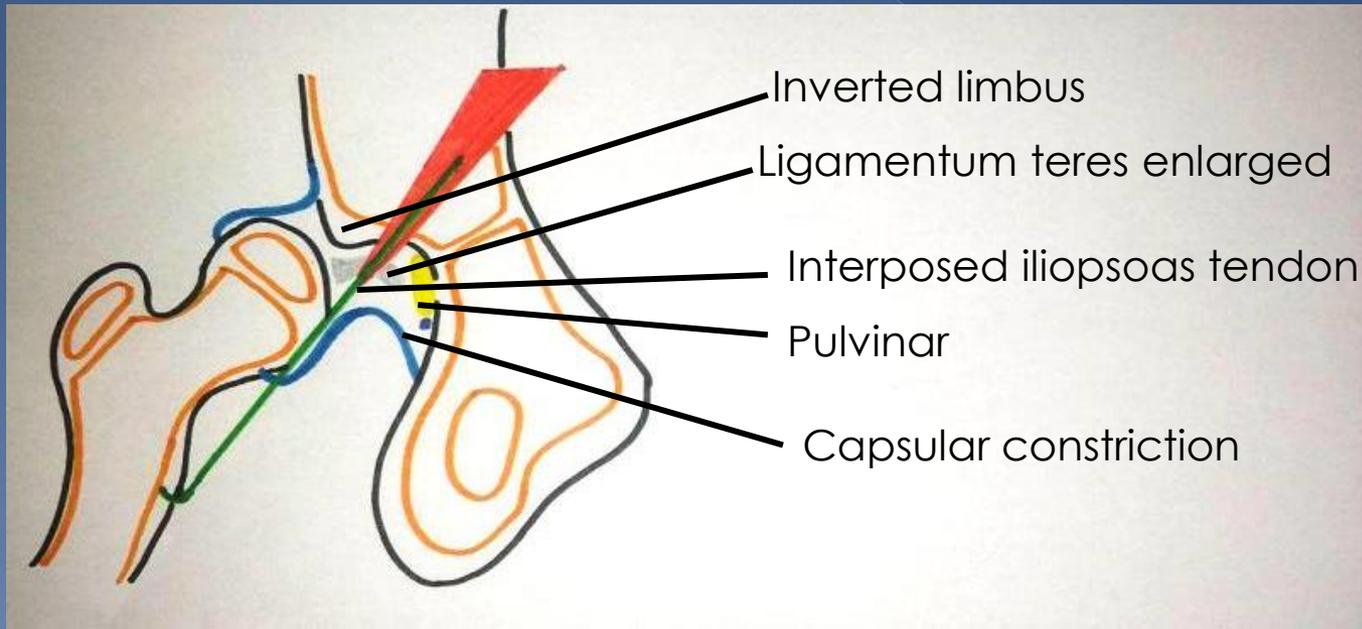
C

D

Dunna classification of the hip dislocation: A-normal hip, B-decentralization, C-subluxation, D-dislocation.

Pathology

- The acetabulum is shallow, the proximal femur shows antetorsion and coxa valga. The iliopsoas tendon is insinuated between the femoral head and acetabulum, causing a depression in the joint capsule, this gives hourglass configuration.
- The acetabular labrum is inverted into the joint, the ligamentum teres is enlarged, the acetabulum contain fat (pulvinar).



Incidence

- The incidence of a dislocated hip at birth is about 0,5%, the incidence of subluxation and dysplasia is 1%; when implementing universal ultrasonographic screening, the reported incidence is 2,5 – 5 %

Incidence



- The incidence DDH is higher in cultures that still swaddle with the lower extremities fully extended and wrapped together. Studies in native Americans showed, following a change from traditional swaddling to „safe swaddling” a decrease in the prevalence of dysplasia 6 times. Similar experience was documented in Japan, Turkey and Poland.

Risk factors for hip dysplasia

- Breech position
- Female sex
- Positive family history
- Congenital deformities of lower Limbs (clubfoot)
- Intrauterine crowding syndrome

Breech position

The breech position is probably the most important risk factor for hip dysplasia.



Diagnosis

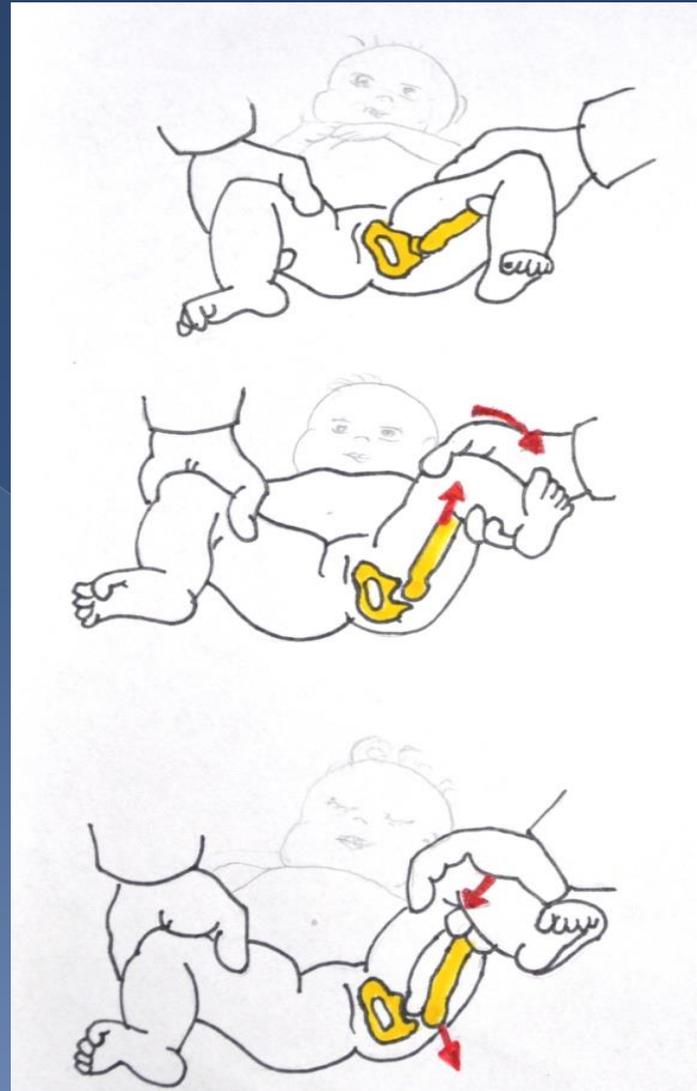
- DDH is an evolving process, therefore the physical examination changes as the child grows. Normal physical examination findings during the immediate postnatal period do not preclude a subsequent diagnosis of DDH

Physical examination

- Every newborn should be screened for signs of hip instability. The hip should be examined using both the Barlow and Ortolani techniques.

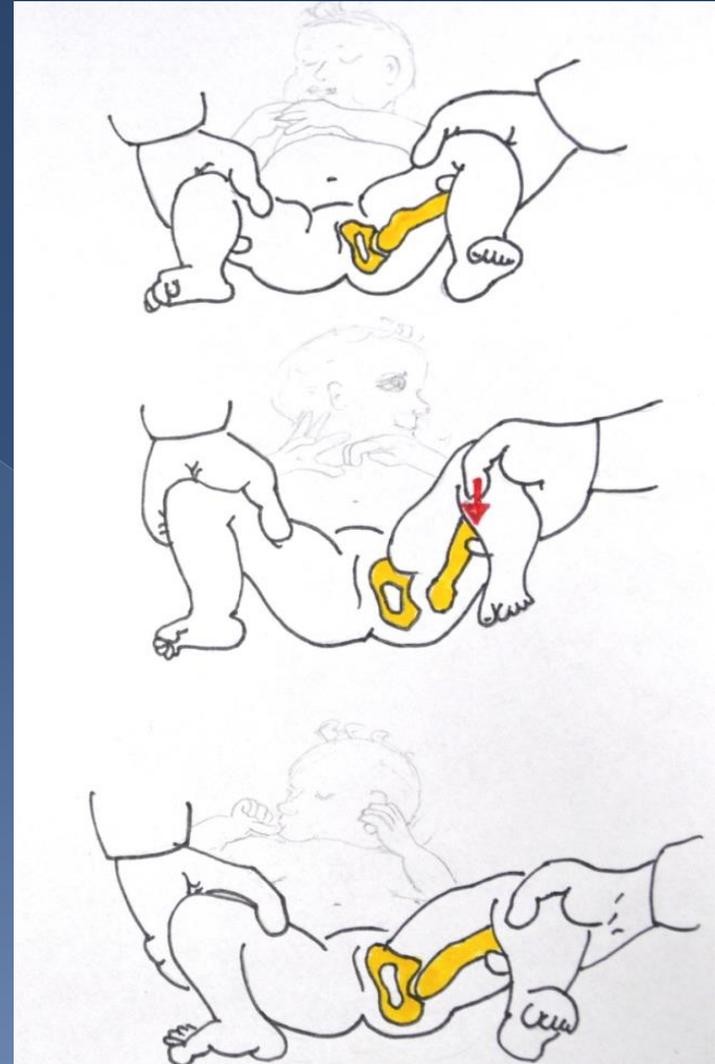
Barlow test

- The Barlow test – hip instability is demonstrated by attempting to displace the hip out of the socket over the posterior acetabulum.

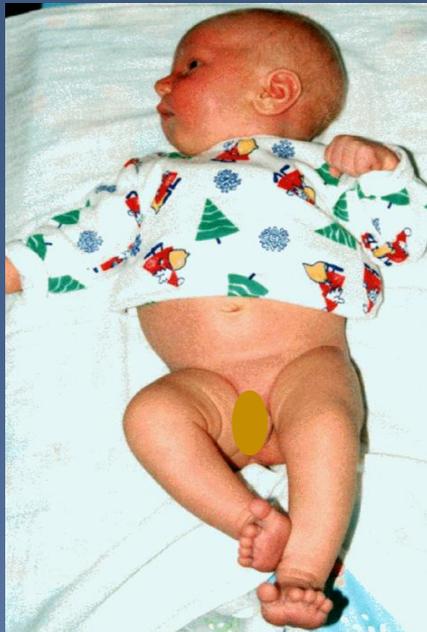


Ortolani test

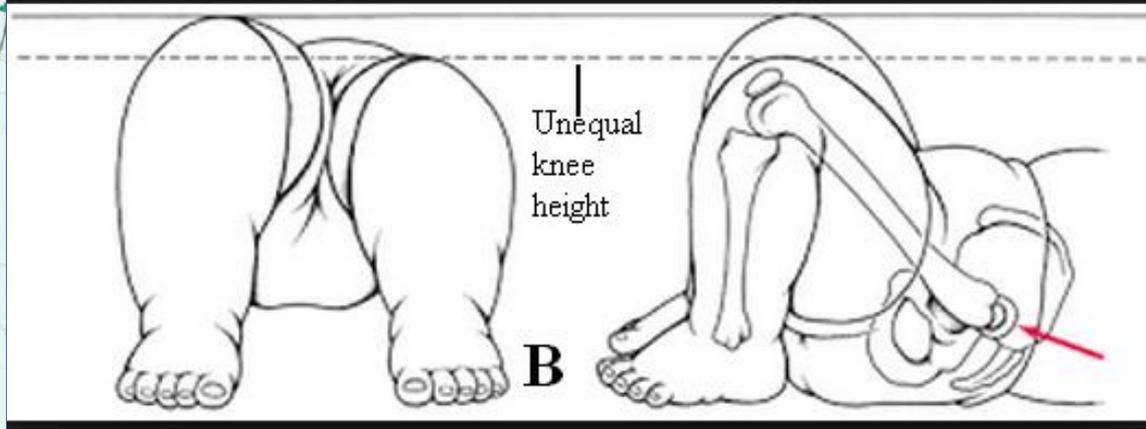
- The Ortolani test– the thigh is first adducted and depressed to subluxate the hip, the thigh is abducted and the hip reduces with a palpable „clunk”.



- The incidence of hip instability declines rapidly, 50 % within the first week. Later, limitation of abduction and shortening are common



Adduction contracture of left hip



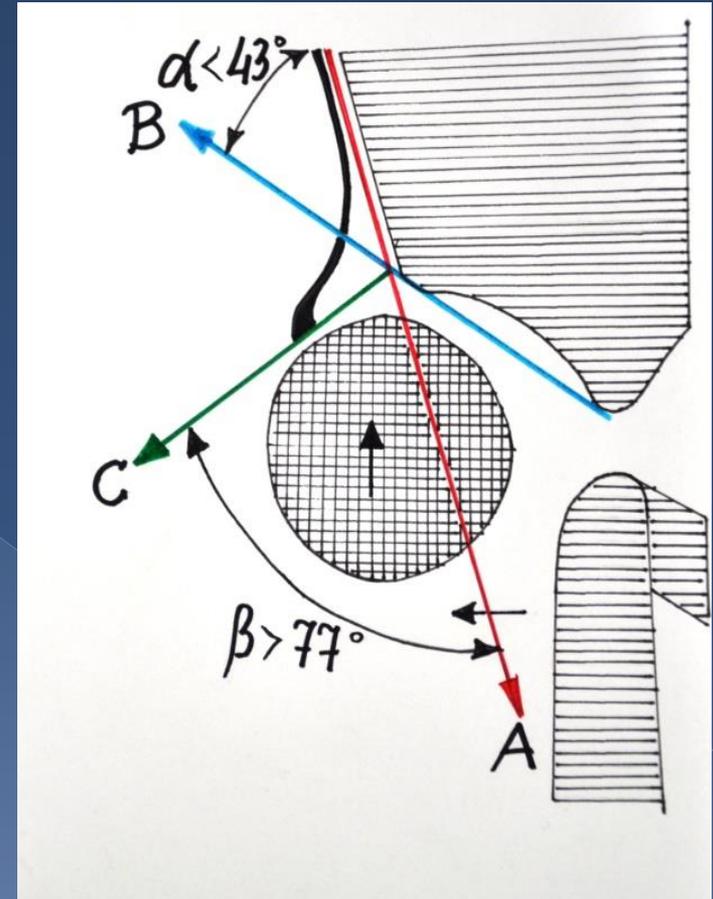
Limited hip abduction (A) and unequal knee heights (B).

Ultrasonography

- Ultrasonographic techniques pioneered by Graf include static and dynamic evaluation of the hip joint. This allows assessment of the static anatomy of the hip and the stability of the femoral head in the acetabular socket. Real-time ultrasonography has been established as an accurate method for imaging of the hip during the first few months of life

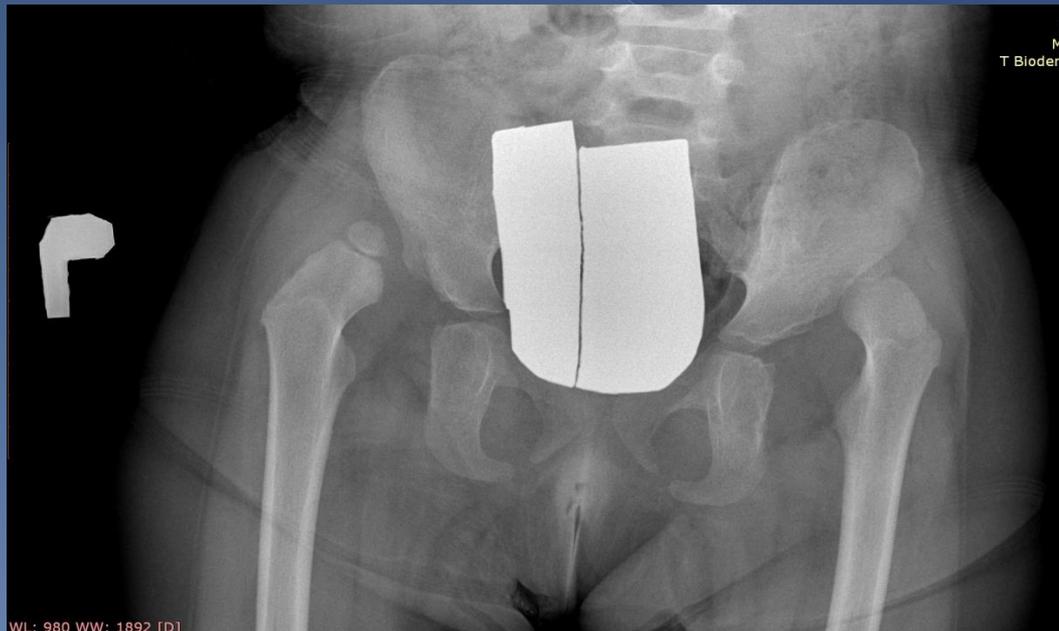


- A coronal image of the hip is obtained and 3 lines are constructed: a vertical line drawn parallel to the ossified lateral wall of the ilium, termed the base line (A); a line drawn from the inferior edge of the osseous acetabulum at the roof of the triradiate cartilage to the most lateral point on the ilium, termed the bony roofline (B); and a line drawn along the roof of the cartilaginous acetabulum, from the lateral osseous edge of the acetabulum to the labrum, termed the cartilage roofline (C).



Radiography

- An anterior-posterior (AP) radiograph is obtained in newborns and infants when other conditions, such as congenital short femur, are suspected. Plain radiography becomes useful for DDH when the femoral head ossification center appears at the age late than 6 months. A single AP pelvic view is usually sufficient



Screening

- In German-speaking countries and in Poland, it has been the custom to perform universal screening with ultrasonography, in the United States, there has been less enthusiasm for universal screening

Treatment

- The management of DDH is challenging. The objectives of management include early diagnosis, reduction of dislocation, avoidance of avascular necrosis, and correction of residual dysplasia. Discussion continues concerning which clinically and sonographically abnormal hips require intervention and by what age.

Birth to 6 months

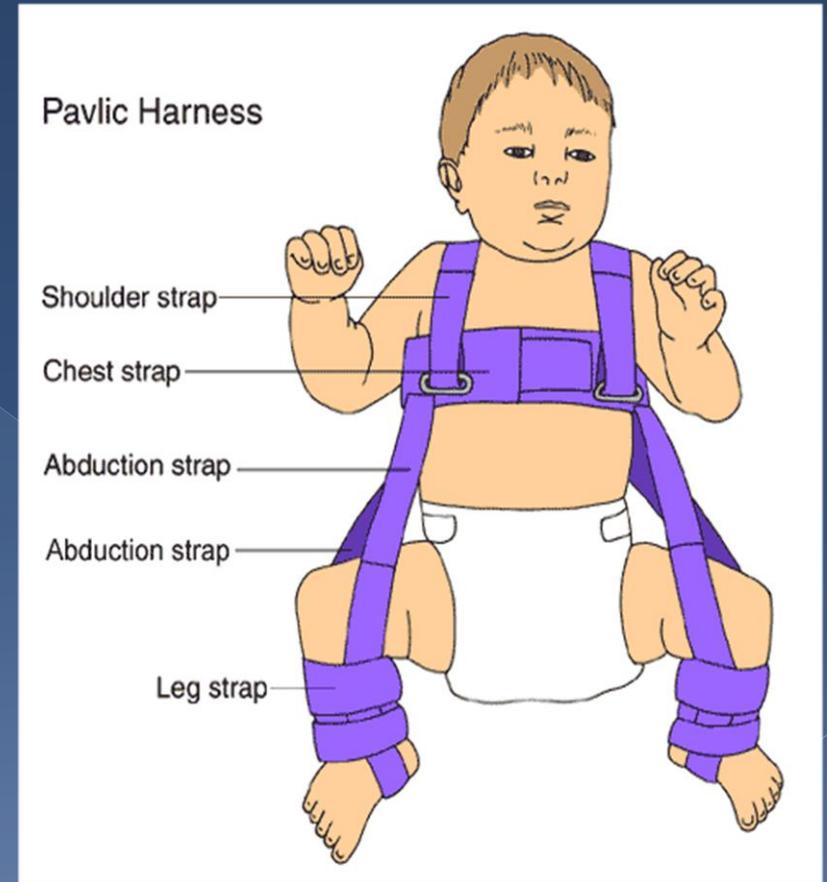
- Many hips have some degree of instability at birth, detectable on ultrasound, which should be observed for 3 weeks without treatment. Observation is permissible for instability and subluxation up to 6 weeks and for sonographic acetabular growth retardation.

Birth to 6 months

- Treatment is indicated in hips that are clinically stable but at 6 weeks still have an abnormal ultrasound. The Clarke and Castaneda consider treatment at 6 weeks if the acetabulum seems morphologically immature, there is instability detected on ultrasound, or an angle is less than or equal to 57°

Pavlik harness

- Various devices have been used for the treatment. Pavlik harness is widely used orthosis allows motion in flexion and abduction of hips. The harness should be carefully fitted and must be comfortable.



From 6 to 18 months

- In this group, most cases of DDH can be managed by closed reduction and spica cast immobilization. Gradual reduction using long-term traction techniques has been described as a mean of closed reduction.

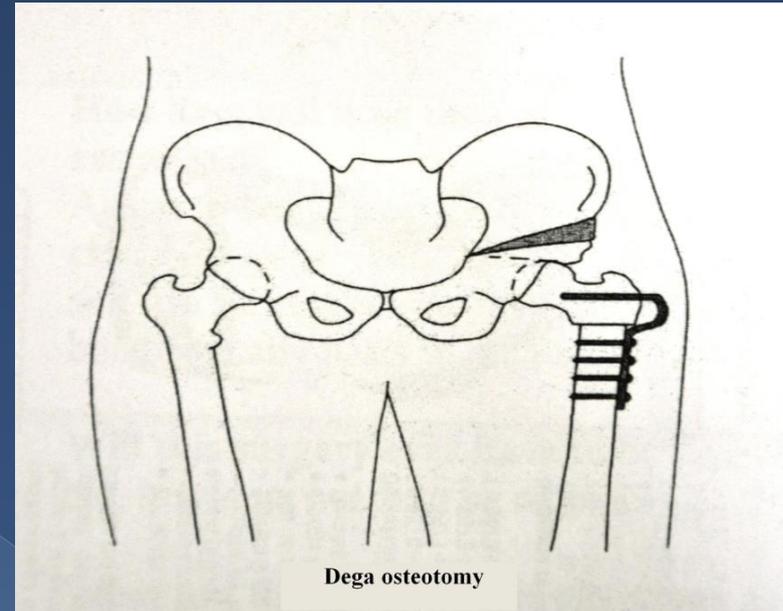


Older than 18 months

- In this age group, operative management is usually required. Open reduction is indicated for all children who failed to achieve a stable concentric reduction of the hip joint by closed techniques

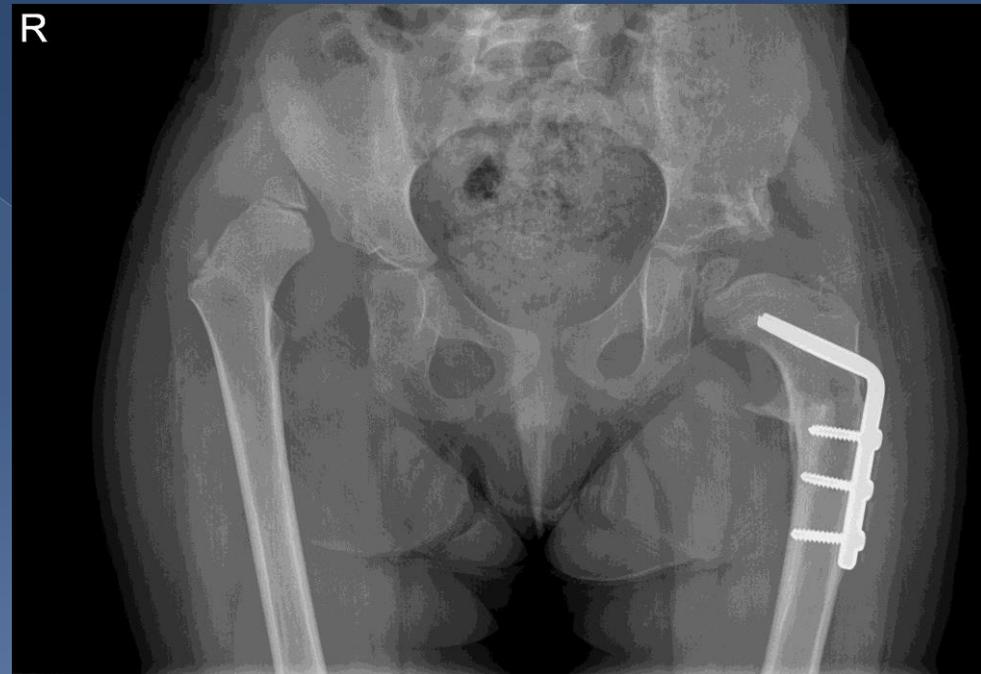
Older than 18 months

- In Poland is popular Dega osteotomy. This technique is consisted of incomplete semicircular osteotomy of the iliac bone, in which the osteotomy runs obliquely from the lateral superior to medial inferior from a point midway between the anterior superior and anterior inferior iliac spine to just anterior to the greater sciatic notch.



Older than 18 months

- This acetabuloplasty is often connected with femoral osteotomy. Femoral shortening is essential in the older child with unreduced DDH



Our experience

- At the Department of Children Orthopedics of Medical University of Białystok we are screening of all newborns with ultrasonography. We began in 1992 with on average, 1 500 test per year. Before that was performed clinical physical examination alone, a radiography was done usually at the age of 3-4 months newborns with clinical evidence of DDH.

Our experience

- During the first visit in our outpatients we teach parents the appropriate treatment of a child with special attention to maintain abduction position of hips. Particular attention is paid to children with risk factors such as breech birth, female gender, positive family history, congenital deformities of the lower limbs or intrauterine crowding syndrome.

Prevention of hip dysplasia - always „frog” position



Our experience

- Treatment of dysplasia was dependent on the degree of immaturity of the hip and the age of the child, in which the diagnosis of hip dysplasia was made.

We beginning treatment of child at 6 weeks, if the acetabulum is morphologically immature and instability detected on ultrasound, or an a angle is less than 57° . We are using generalny Pavlik harness.



Our experience

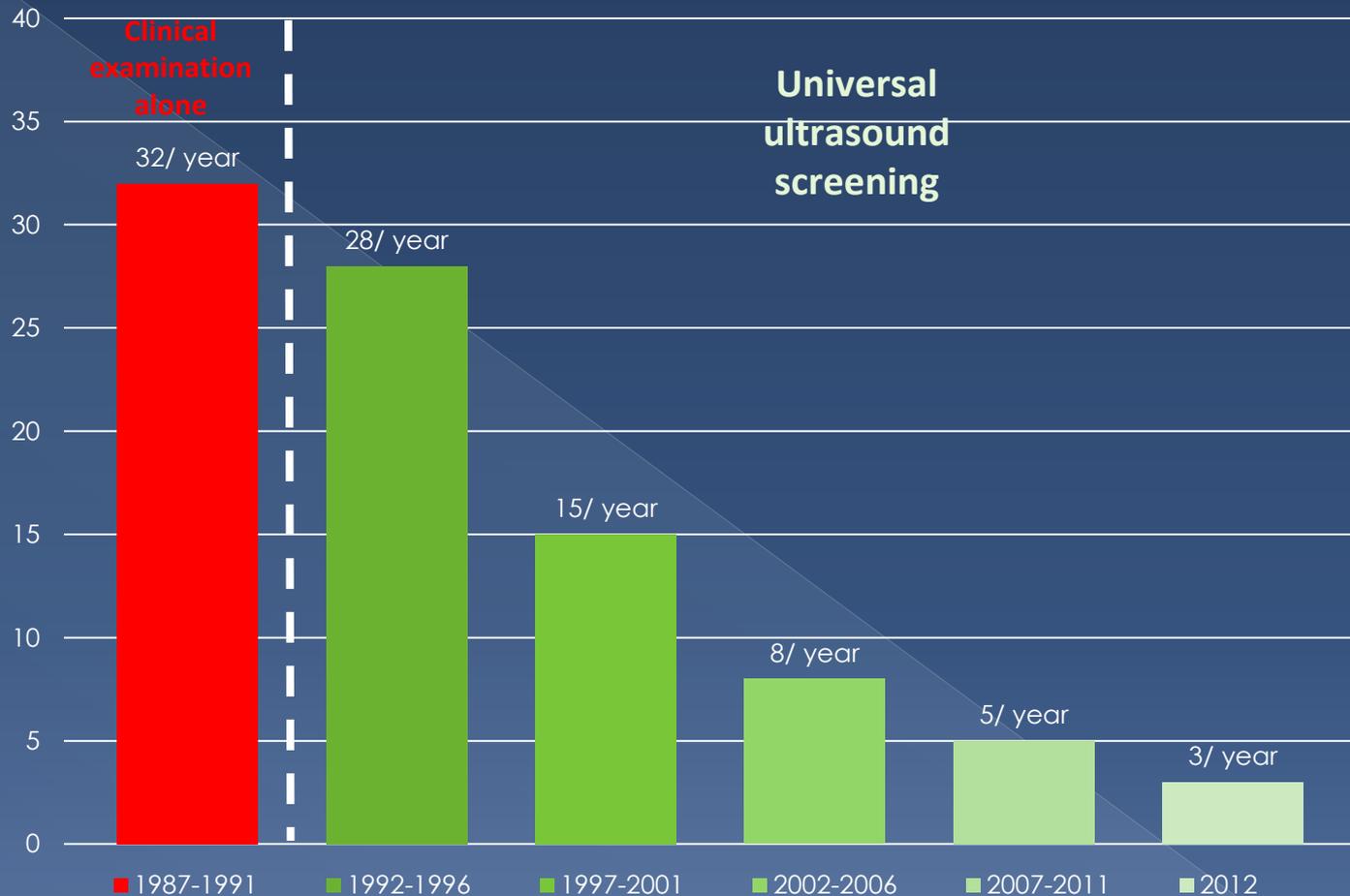
- In older child (6 to 18 months) in type III and IV according Graf we using gradual reduction by long-term traction technique and next closed reduction with spica cast immobilization.

This method we are treatment about 8 children per year.



Our experience

- Open reduction is indicated for all children older than 18 months, who failed to achieve a stable concentric reduction of the hip joint by closed techniques. A retrospective analysis we have done, compared the number of surgical interventions before and after introduced universal ultrasound screening.



The number of surgical treatment of hips per year in children in the age of 2-5 years with DDH before and after the ultrasound screening.

Our experience

- Based on this analysis of our material we noticed new trends. In the years 1987-1991 were treated surgically from 25 to 35 children each year with DDH

Our experience

- Ultrasound examination technique of R. Graf in the diagnosis of DDH was introduced as a standard in our clinic in 1992, while from 1992 to 2006 followed by a slow decline in the operated hip to an average of 25-10 per year. The number of surgically treated hips decreased steadily and is now at the level of 3-4 per year.



Thanks for attention