



Available online at
 ScienceDirect
www.sciencedirect.com

Elsevier Masson France

www.em-consulte.com/en



ORIGINAL ARTICLE

Irreducible developmental dysplasia of the hip due to acetabular roof cartilage hypertrophy. Diagnostic sonography in 15 hips

C. Tréguier^a, C. Baud^b, M. Ferry^a, J.-L. Ferran^b, P. Darnault^a, M. Chapuis^c,
S. Marleix^c, B. Fraisse^c, P. Violas^{c,*}

^a Pediatric Radiology Department, South Hospital, boulevard de Bulgarie, 35200 Rennes, France

^b Pediatric Radiology Department, Arnaud de Villeneuve Teaching Hospital Center Hospital, 34000 Montpellier, France

^c Pediatric Surgery Department, South Hospital, 16, boulevard de Bulgarie, 35203 Rennes, France

Accepted: 14 March 2011

KEYWORDS

Irreducible
developmental
dysplasia of the hip;
Sonography;
Arthrography;
MRI;
Surgery

Summary

Introduction: Irreducible developmental dysplasia of the hip (DDH) in newborns is a rare entity. The different obstacles preventing reduction have been described in the literature.

Hypothesis: A clinical form of DDH with hypertrophy of the cartilage of the acetabular roof (acetabular bulge) can be reliably identified on ultrasound and should probably be defined as a separate entity.

Materials and methods: For the first time, the authors report their experience, a review of the literature and the radiographic description (ultrasound, arthrography MRI) of irreducible neonatal DDH due to hypertrophy of the cartilage of the acetabular roof (acetabular bulge) in 12 infants (15 hips).

Results: Neonatal sonography seems to be sufficient to identify this specific clinical entity without any additional work-up. This sonographic sign could help determine the therapeutic strategy earlier in this severe and complex form of DDH.

Level of evidence: Level IV. Diagnostic Study.

© 2011 Elsevier Masson SAS. All rights reserved.

Introduction

Sonography of the hip is a remarkable tool for the screening and early diagnosis of developmental dysplasia of the hip (DDH) in newborns. This does not exclude the need for a careful, systematic clinical examination to obtain a complete clinical picture. The term “DDH” is debatable.

* Corresponding author. Tel.: +33 2 99 28 43 21.
E-mail address: philippe.violas@chu-rennes.fr (P. Violas).

Many terms are used: instability, pathological dislocation, congenital dislocation of the hip (CDH), or DDH. The irreducible character of this entity is even less well defined. For some, these hips are considered to be irreducible at birth, may sometimes still be called teratological, for others they correspond to dislocated hips that do not respond to appropriate orthopedic treatment.

Irreducible neonatal DDH is a rare entity, corresponding to approximately 1% of all DDH [1]. The obstacles preventing reduction of the dislocated hip have been described in the literature: inversion of the labrum, interposition of the psoas, narrowing of the capsular isthmus, thickening of the round ligament (ligamentum teres) and of the transverse ligament of the acetabulum, thickening of the fibrofatty pulvinar tissue and hypertrophy of the cartilage of the acetabular roof (acetabular bulge) [2–5].

Imaging techniques (sonography, arthrography, MRI) are used to evaluate the mechanisms preventing reduction and play a role in choosing the treatment strategy.

The aim of this study was to describe the sonographic signs of irreducible neonatal DDH from acetabular bulge and to correlate the results with other imaging techniques.

In the presence of suspected DDH at the clinical examination, the goal was to perform early sonography to confirm the diagnosis of this severe form of DDH from acetabular bulge, and to determine the therapeutic strategy, such as first line surgical reduction, without prior orthopedic treatment.

Materials and methods

This is a retrospective study of 15 pathological hips in 12 patients (9 girls and 3 boys, the bilateral cases only occurred in girls). The study was performed between January 1990 and December 2000, and infants were followed in Pediatric Units in University Hospitals in Rennes and Montpellier, France. Ten patients had no other associated diseases, while one patient presented with a Turner syndrome and another with a convex pes valgus contralateral to the dysplasia.

The clinical examination showed limited abduction in 11 cases, a snapping sensation in five cases and pseudo-shortening (positive Galeazzi sign) in three cases.

Early sonography was performed in all children, at between 2 and 40 days after birth (mean age: 21 days). Two types of ultrasound were used: HDI ultramark nine ATL using a 5–10 MHz probe and HDI 5000 ATL using a 5–12 MHz probe. The Couture [6] method was used for the examination. This includes scanning the external frontal plane with the infant in the decubitus dorsal position, with the hip in flexion-adduction. The sonographic references used for this method are the pubic bone which is an essential reference for this scan, the rectilinear coxal bone and the deepest part of the acetabular roof. The normal value for the acetabular fossa is ≤ 6 mm [7] as shown in Fig. 1. A dynamic examination to determine the possibility of realigning the femoral epiphysis completed the morphological examination.

Analysis of each sonography included: the thickness of the acetabular fossa, the bone covering the femoral head, the morphology of the acetabulum, the thickness and the sonographic structure of the acetabular hyaline cartilage,

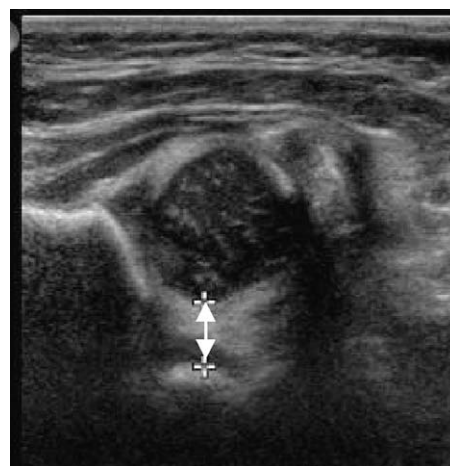


Figure 1 Measurement of the acetabular fossa (white arrow) between the pubic bone and the medial proximal femoral epiphysis.

the position of the labrum and the largest diameter of the proximal femoral epiphysis.

Thirteen arthrographies (10 infants, including three bilateral forms) were obtained in neutral and dynamic positions under general anesthesia by the obturator route. Arthrographic signs suggesting the presence of an anatomical obstacle to reduction were analyzed (morphology of the acetabular cartilage and labrum, thickness of fibrofatty pulvinar tissue, images of musculoligamentary structures such as the psoas, ligamentum teres and the capsular isthmus).

MRI (General Electric 1.5 T and Siemens Magnetom Vision 1.5 T) was performed in eight hips (six children including two with bilateral forms). The age at MRI was between 3 months and 3 years old (mean 9 months). T1-weighted Spin Echo (TR 360 at 580 ms, TE 14 at 30 ms) and gradient echo (GE) T2 (TR 380 at 480 ms, TE 18 at 30 ms, flip angle 30°). sequences were performed with 3 mm thick slices every 0.3 mm. Axial and coronal slices were performed for each sequence. The following criteria were analyzed: the position of the proximal femoral epiphysis in relation to the acetabulum, the depth of the acetabulum, the signal and morphology of the acetabular cartilage, the labrum, the thickness of the fibrofatty pulvinar tissue and the capsule, the morphology of the triradiate cartilage and the previously mentioned musculoligamentary structures.

Results

A high posterior dislocation of the proximal femoral epiphysis (Fig. 2) was found on sonography in all cases, with an absence of bony coverage by the true acetabulum. The diameter of the proximal femoral epiphysis was small, a mean 12 mm (10–14 mm), for a normal value of 14 mm. In five cases, it was found across from an echogenic neoacetabulum. In 12 cases, a hyperechogenic structure identified as the labrum was found inverted in the joint. In three cases, the labrum was not identified. The sonographic sign that was found in all cases was thickened acetabular roof cartilage (acetabular bulge), with acetabular hyaline cartilage located in the anterosuperior portion of the coxal bone.

Download English Version:

<https://daneshyari.com/en/article/4081910>

Download Persian Version:

<https://daneshyari.com/article/4081910>

[Daneshyari.com](https://daneshyari.com)