

## SHORT COMMUNICATION ΒΡΑΧΕΙΑ ΔΗΜΟΣΙΕΥΣΗ

# Hip ultrasound in the newborn Recommendations for screening for developmental hip dysplasia (DDH)

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Υπερηχογράφημα ισχίων σε νεογέννητα –  
Συστάσεις για προληπτικό έλεγχο  
της αναπτυξιακής δυσπλασίας  
των κατ' ισχίου αρθρώσεων

Περίληψη στο τέλος του άρθρου

**Key words:** Developmental dysplasia of hip (DDH), Infant, Screening, Ultrasound

Developmental dysplasia of hip (DDH) represents a spectrum of anatomic hip abnormalities, in which the femoral head and the acetabulum are in improper alignment and/or grow abnormally. DDH can lead to premature degenerative joint disease, impaired walking and chronic pain. The natural history of untreated DDH in the newborn is quite variable: Most unstable hips will stabilize soon after birth, some may go on to subluxation or dislocation and some may remain located but retain anatomic dysplastic features. Since it is not possible to predict the outcome of unstable hips in newborns, all newborns with clinical hip instability should be treated. On the basis of understanding the normal growth and development of the hip, the first goal of treatment is to obtain and maintain reduction in order to provide an optimal environment for further development of the joint. The later the diagnosis of DDH is made, the more difficult it is to achieve these goals, the less potential there is for acetabular and the proximal femoral remodeling and the more complex are the required treatments.<sup>1</sup>

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Clinical examination (positive Ortolani sign [=click of entry] or positive Barlow sign [=click of exit]) remains the gold standard diagnostic tool but ultrasonography (US) has gained popularity worldwide as a screening tool in newborns and infants. The routine use of US in the diagnosis and treatment of DDH was pioneered by Graf in Austria in the 1970's. Infant hip ultrasound imaging should be performed by trained, experienced personnel in 4–5 weeks and potential follow up in 11–12 weeks of infant's life (in cases of newborns with severe hip instability on clinical examination at birth, some investigators advise that US examination should be performed earlier at the age of 2 weeks to document those more severely affected and initiate earlier treatment). The method includes static and dynamic joint control. The static US method (introduced by Graf) is a standardized approach for: (a) The assessment of acetabular morphology and (b) the measurement of  $\alpha$  and  $\beta$  angles, for the quantification of bony socket and cartilaginous acetabular roof, respectively (figures 1, 2). The static method is widely used in Europe and is often combined with dynamic US method (presented later on by Harcke et al in the United States). The rationale of dynamic method is to examine the position of femoral head during rest and stress testing (Barlow maneuver).

Hip dislocation that is diagnosed in older infants often requires surgical intervention.

Countries (such as Austria, Czech Republic and Germany) with established nationwide hip US screening programs report the lowest rates of open reduction for established

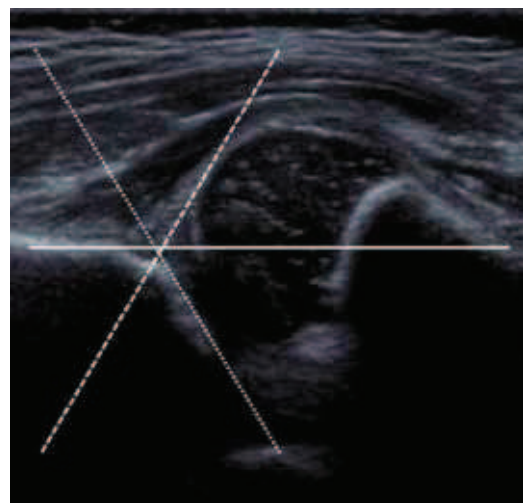
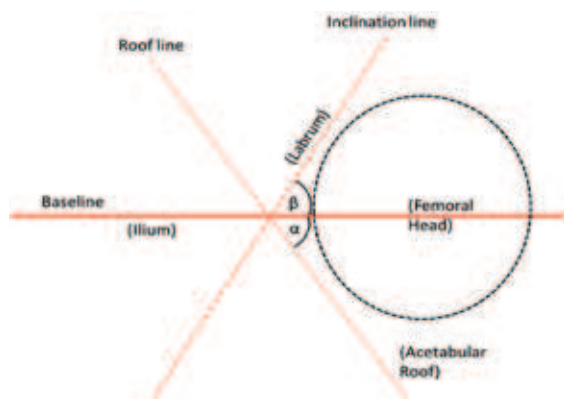


Figure 1. Infant hip ultrasound: Normal longitudinal oblique view.



**Figure 2.** Gross hip anatomy, in terms of infant hip ultrasound.

and or late diagnosed hip dislocation between 0.07 and 0.26. Countries with clinical screening for DDH without sonography (such as New Zealand and Ireland) report open reduction rates of between 0.78 and 1.30 per 1.000 births and represent the baseline for comparison and possible improvement.<sup>2</sup>

The implementation of infant hip US as a screening tool for DDH is not well documented, since there is no statistically solid evidence that US screening reduces the prevalence of late-presenting DDH.<sup>3,4</sup> In accordance with that, the ESPR DDH task force concludes that at present there is no consensus on neonatal ultrasound technique, screening strategies or indications for treatment, but recommends selective infant hip ultrasound screening in areas with high prevalence of late DDH provided that the US screening is of high quality; if selective screening has no effect on the prevalence of late DDH cases, universal screening should be considered. Selective screening includes newborns with risk factors for DDH: Family history of DDH (at least one first degree relative or two second degree relatives treated for DDH), infants with breech presentation or foot deformities and positive or equivocal clinical findings.<sup>5</sup>

**ΠΕΡΙΛΗΨΗ**

**Υπερηχογράφημα ισχίων σε νεογέννητα – Συστάσεις για προληπτικό έλεγχο της αναπτυξιακής δυσπλασίας των κατ’ ισχίου αρθρώσεων**

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Η αναπτυξιακή δυσπλασία του ισχίου (ΑΔΙ) περιλαμβάνει ένα ευρύ φάσμα ανατομικών ανωμαλιών της άρθρωσης του

ισχίου, κατά τις οποίες οι αρθρικές επιφάνειες της κεφαλής του μηριαίου και της κοτύλης δεν βρίσκονται σε επαλληλία ή συνυπάρχει διαταραχή της ανάπτυξής τους. Η κλινική εξέταση των ισχίων παραμένει η διαγνωστική μέθοδος αναφοράς, αλλά η υπερηχοτομογραφία (US) είναι πλέον ευρέως διαδεδομένη σε παγκόσμιο επίπεδο ως μια μέθοδος για την πρώιμη ανίχνευση της ΑΔΙ σε νεογέννητα και βρέφη. Η καθολική εφαρμογή της US ισχίων ως μεθόδου πρώιμης ανίχνευσης και διάγνωσης της ΑΔΙ δεν είναι επαρκώς επιδημιολογικά τεκμηριωμένη. Η επιτροπή εμπειρογνομόνων της Ευρωπαϊκής Παιδιατρικής Ακτινολογίας, καθώς δεν υπάρχει καθολική συμφωνία στη στρατηγική πρώιμης διάγνωσης στον πληθυσμό (screening) ή τις ενδείξεις θεραπείας της ΑΔΙ, συστήνει την επιλεκτική εφαρμογή του υπερηχογραφήματος ισχίων σε περιοχές στις οποίες παρατηρείται υψηλή επίπτωση όψιμα διαγνωσμένης ΑΔΙ (με την προϋπόθεση να διενεργείται από προσωπικό με εμπειρία στο αντικείμενο) και σε νεογνά με παράγοντες κινδύνου: θετικό οικογενειακό ιστορικό (τουλάχιστον ένας συγγενής 1ου βαθμού ή δύο συγγενείς 2ου βαθμού, που έλαβαν θεραπεία για ΑΔΙ), νεογνά με ισχιακή προβολή ή παραμορφώσεις άκρου ποδός, καθώς και σε κάθε περίπτωση σαφών ή αμφιλεγόμενων κλινικών ευρημάτων αστάθειας στα ισχία.

**Λέξεις ευρητηρίου:** Αναπτυξιακή δυσπλασία ισχίου, Βρέφος, Μέθοδος πρώιμης ανίχνευσης (screening), Υπερηχογράφημα

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