

SURE ABOUT CLICKY HIPS!

Khawaja Bilal Waheed, Muneerah Al Bassam, Marissa Ibey Comayas
King Fahad Military Medical Complex (KFMMC) Dhahran Saudi Arabia

INTRODUCTION

Developmental dysplasia of the hip (DDH) is a common and preventable cause of childhood disability, and forms a large portion of pediatric orthopedic practice. Approx. 1/100 babies have hip instability immediately after birth, majority of these resolve in first few weeks of life, leaving incidence of DDH to 1-2/1000. Screening is thought to reduce incidence of late DDH by 50%. Typical risk factors for DDH are said to be female, first born, breech position, positive family history, left hip and unilateral involvement. Many studies demonstrate an increase of DDH in the winter [1]. Swaddling is strongly associated with DDH. DDH is extremely rare in Africans. Carrying the infant in an abducted position straddling the iliac crest is postulated as protective against DDH in the African peoples. Ultrasound is easy, non-ionizing and readily available modality to evaluate hip stability and dislocation in neonatal period, and can be used in initial few months of age till development of bony femoral capital epiphysis for which radiographs may be more informative and useful. US techniques include static evaluation of morphologic features of hip, as popularized in Europe by Graf, and a dynamic evaluation as developed by Harcke that assesses the hip for stability of femoral head in socket as well as static anatomy [2].

Objective

We aim to evaluate justification and need of commonly requested neonatal hip ultrasounds for clicky hips.

Materials and Methods

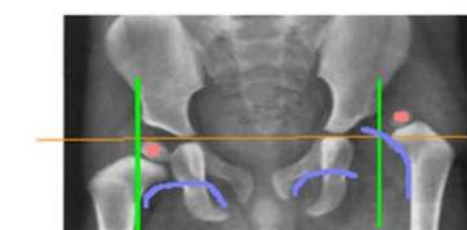
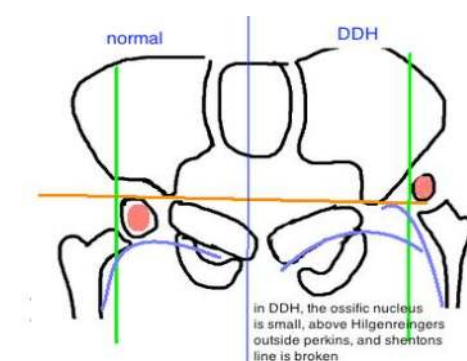
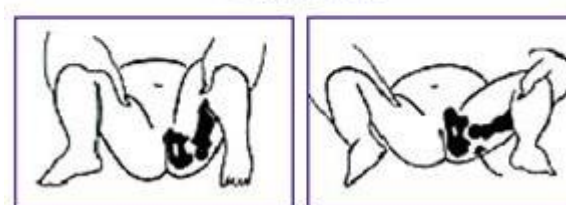
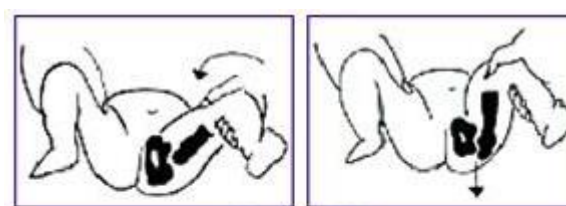
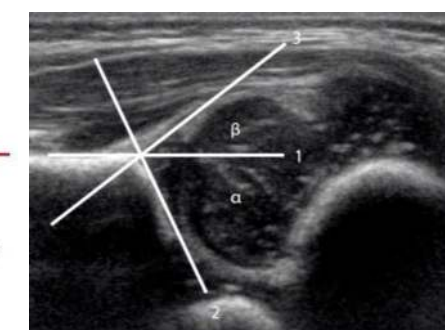
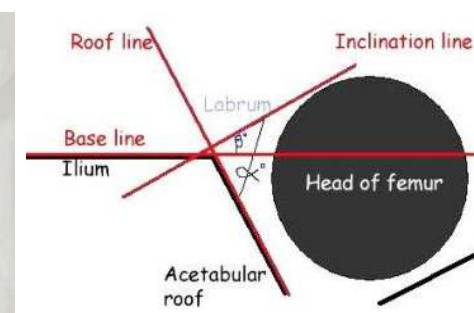
We retrospectively reviewed neonatal hip ultrasounds performed between May to November 2018 (6 months) under clinical indication/requests of clicky hips.

Neonatal hip ultrasound performed for evaluation of other etiologies (like haematoma or septic arthritis) were excluded. Hip ultrasounds performed by single operator and on same machine (Aplio MX, Toshiba 2010) were selected. Static imaging was performed, and alpha and beta angles were measured [ultrasound image on the right]. Follow up ultrasounds after 1-2 months of initial screening and plain radiographs (of pelvis) were performed at 4-6 months of ages (where indicated), as being practiced in our department.

Imaging findings were reviewed by two general radiologists with special interest in pediatric imaging, and mutually agreed decision for final reporting was made to avoid inter-observer discrepancies. Ultrasound findings were categorized as normal (Graf-I), Graf-IIa, Graf-IIb, Graf-III and dislocation (Graf-IV; DDH). Chi-square was used to determine association with gender.

Results

Out of 100 neonatal hip ultrasounds, 4 babies were having DDH (4%), including 3 females and 1 male. One female and a male were having unilateral disease, while the remaining 2 females were having bilateral disease. No association of DDH was seen with gender (P-value 0.90). All Graf-IIb were found to be normal on follow up imaging. Two Graf-III cases developed dislocation on follow up radiographs.

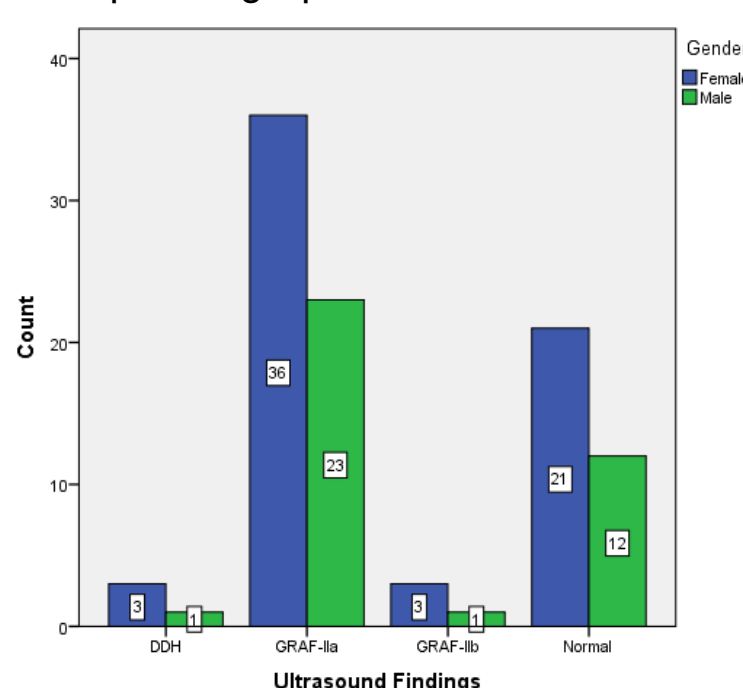
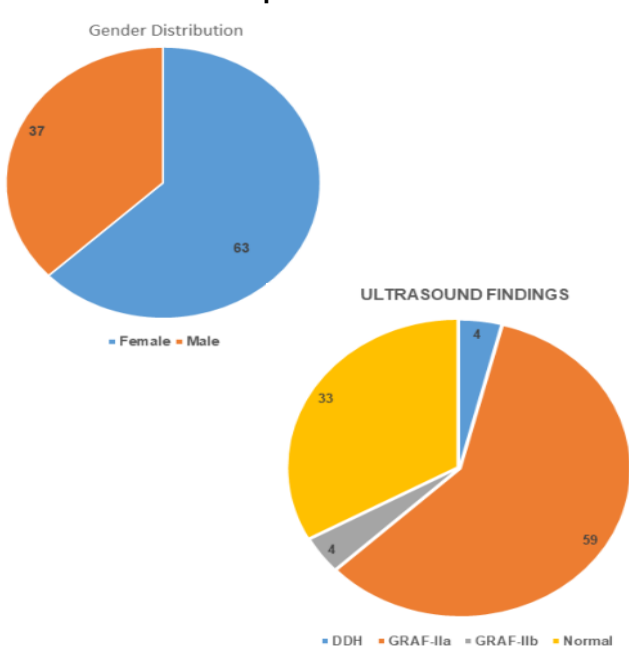


orange is Hilgenreiner's line
green is Perkin's line
pink is the femoral head ossific nucleus
periwinkle is Shenton's line

Graf classification of DDH [simplified]

class	Alpha angle	Beta angle	description
1	>60	<55	normal
2	43-60	55-77	Delayed ossification
3	<43	>77	lateralization
4	unmeasurable	unmeasurable	dislocated

	Gender		Total
	Female	Male	
DDH	3 75.0%	1 25.0%	4 100.0%
GRAF-IIa	36 61.0%	23 39.0%	59 100.0%
GRAF-IIb	3 75.0%	1 25.0%	4 100.0%
Normal	21 63.6%	12 36.4%	33 100.0%
	63	37	100
	63.0%	37.0%	100.0%



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DISCUSSION

We found that neonatal hip ultrasounds are over-requested imaging. Clinical examination for neonatal hips needs to be performed by experienced neonatologist. Understanding of Graf-classification of ultrasound findings may limit over-investigation by pelvic radiographs at an early stage without useful information [1]. Clicky hips with normal hip examination should be considered a variant of normal childhood and not a risk factor for DDH. Majority of clicky hips require no treatment other than reassurance to parents [2]. An initial screening ultrasound at 2-4 week (if clicky hip and risk factors) and a follow-up ultrasound after 3 months (if Graf-IIa, immature hips) may only be needed. Clicky hips with limited hip abduction may represent a separate clinical entity at risk of hip pathology and therefore warrant further investigations. Graf II-b ultrasound findings (unstable hips) on initial screening ultrasound should be followed up after 1 month with ultrasound and a referral to pediatric orthopedic (if similar or worsening/ dislocation findings). For Graf-III ultrasound findings (dislocation), x-ray pelvis and a direct referral to pediatric orthopedic need to be considered. We observed a higher incidence of DDH amongst the requested examinations probably because of considering only selected cases with clicky hips on clinical examinations, and not in over-all live births as documented by Mirdad T, and Moosa NK [3,4] to be around 3/1000 live births. Al-Mohrej et al noted a higher female percentage and bilateral disease in DDH observed cases [5]. Limitations in our study included retrospective, single-center, short duration study, lacking data of certain known risk factors for DDH.

CONCLUSION

Ultrasound is a technique of choice for clarifying a physical finding, assessing a high-risk infant, and monitoring DDH as it is observed or treated.

Dr. Khawaja Bilal Waheed, FCPS, EDiR, Senior Specialist Radiologist,
King Fahad Military Medical Complex (KFMMC), 31932 Dhahran Saudi
Arabia, Contact 00 966 561299756, Email: docbil@hotmail.com

