

Correspondence

Ultrasound measurements of the newborn hip—comparison of two methods in 657 newborns

Sir—I agree with Czubak et al. (*Acta Orthop Scand* 1998; 69: 21–24), that the Graf and the Terjesen methods cannot be compared. In the Terjesen method, only the percentage of bony coverage of the head is measured, the cartilaginous coverage and the deformation and pathoanatomical situation of the hyaline cartilage, nonossified acetabulum roof is not analyzed, as in the Graf method.

1. The authors should describe what the cartilage deformation in the Terjesen types of “subluxation” and “dislocation” looks like.

2. The authors tell us that 3.9% of the hips are dislocated or subluxated with the Graf method, and 2.9% with the Terjesen method. However, only type D, III and IV (1.9%) are dislocated hips, because type IIc is not “subluxated”. It is unclear why the authors arrive at the result in the “discussion” that dislocated and subluxated hips had been found in their study in 3.2%.

3. It is mentioned that 13 hips were diagnosed as subluxated by both methods. It should be explained what type had been classified as subluxated, when there is no Graf type “subluxation”. In Table 1, there are 13 subluxated hip joints, but in Table 2, these 13 hips cannot be found under the heading “subluxation”.

4. In Table 4, the Graf and Terjesen methods are compared with outcome. With the Terjesen method, 5 joints are classified as subluxated, but are listed in the type I column with the Graf method. Type I is a healthy joint. The authors should analyze and explain the discrepancy why 5 hip joints are classified as subluxated with the Terjesen method, but as healthy joints with the Graf method. Where were the mistakes made: in the measurements, in the wrong sectional plane, etc.

5. There is also a discrepancy in Table 2 and Table 4 as regards “Dislocations”. With the Terjesen-method only 2 hip joints were classified as dislocated (Table 2) and are shown in Table 4 under type III. In Table 1, 6 hips are type IV (dislocations with “inverted” limbus), but such type IV joints have disappeared in Table 4. Where are they now?

6. The authors mention that, in comparing the 2 methods twice as many using the Graf method had been diagnosed “as possible and slight dysplasia”.

With the Terjesen method, 14.3% had been classified as possible dysplasia. This classification does not exist in the Graf method. Type II a (29.1%) is neither “possible” nor is “slight dysplastic”, but immature with expected normal development without treatment. Why do they find a better specificity when the groups cannot be compared?

7. The authors should explain why they propose to do the examination at the age of 2–3 months, when they say that acetabulum development is better in the first 2 months of life than later. When they change the ultrasound screening from the newborn period to 2–3 months, they cannot use the good potential for acetabular development in the first 2 months in hips which need treatment. I would like the authors to explain this discrepancy.

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Sir—First of all, we thank you for your interest in our article. Since ultrasound examination of the locomotor apparatus, and the hip in particular, belong to the most important areas of activity in pediatric orthopedics, we are glad to reply to your comments.

Discussions concerning ultrasound screening of the hip joint involve the question of observer-independence. Thanks to the Graf and Terjesen methods, and with increased experience of other colleagues it has been possible to convert ultrasound screening into an observer independent examination, provided specific methodological conditions are fulfilled. However methodologies may differ, the aim remains the same—i.e., diagnosis of hip dysplasia.

1. As for the first question, it should be emphasized that cartilage deformation of the acetabulum has been precisely described by Graf. The picture of this deformation is identical with the Terjesen method because of the analogical standard image. With the Graf method, the deformation of the cartilage is included in the

qualitative evaluation of his classification; it is subjective and thus observer-dependent. The Terjesen method, which is only a quantitative evaluation, allows us to distinguish between subluxation and dislocation. The evaluation of the cartilage deformity does not directly influence the final results.

2. 3.2% refers to children and not to hips, in which we diagnosed dislocated or subluxated hips during the first examination. In our opinion, and we think also in the opinion of the author of the method, type IIc describes truly pathological hips: unstable or potentially unstable. The doubts expressed in the comments suggest that distinguishing this type may cause difficulties in understanding its clinical importance. Similar doubts may concern other types, unless we take into account the clinical examination of the hips.

3. Although there is no Graf type "subluxation", there are subluxated hips in children. We use this term and arbitrarily qualify type D and III as subluxation. The number of subluxated hips (13) in Table 2, shown by both the Graf and Terjesen methods, is correct.

4. The results refer to the first examination of the newborns, i.e., the most immature hips. In 5 hips, the alpha angle was larger than 60 degrees, and at the same time there was a deficiency of the femoral head coverage, according to the Terjesen method, ranging from 35% to 39% FHC. In the absence of clinical symptoms, we found no indications for treatment and at the next examination, after 6 weeks, all these hips were classified as healthy. This confirms our observations, like those of other authors, including Graf, concerning the natural development of the hip joint.

5. The last column was missing in Table 4.

6. We do not think it is important if the group of joints requiring a further examination is called "possible dysplasia" or "immature hip". We agree with Dr. Graf that type IIa is the immature hip, which largely becomes normal without treatment. Here we want to emphasize that we are speaking about hip joints with-

out clinical symptoms. "Largely" suggests that not all of the hip joints become normal, so being "possibly dysplastic" they require an additional check-up. The significant difference between hips type IIa (29.1%) and type "possible dysplasia" (14.3%) refers only to the first scan in newborns. It is due to the great sensitivity of the Graf method concerning the degree of natural, physiological calcification of the acetabular rim. This "hypersensitivity" is not necessarily an advantage of the method in the group of children under discussion. While analyzing the results of measurements done with both methods, we showed that both the alpha angle and FHC change very significantly in the first three months of life, which confirms the observations made by Castelein et al. (1992), Holen et al. (1994) and Graf et al. (1993). Our own analysis and the observations of the above authors made us suggest that the date of the first examination of healthy newborns (i.e., newborns without clinical symptoms and other risk factors) be postponed until the 9th or 10th week when, in our results, most of the hip joints become sonographically mature. This would reduce the number of hip joints diagnosed as immature, as well as the number requiring treatment. On the other hand, the question should be raised whether the ultrasound diagnosis of hip dysplasia is as clinically important for our young patients as the diagnosis of hip dysplasia, with its instability and/or limitation of movement in the hip joint. Will the diagnosis of sonographic—i.e., small hip dysplasia—in the 9th or 10th week of life prevent reliance on nature to normalize the hip joint?

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