Correspondence

Breech presentation is a risk factor for dysplasia of the femoral trochlea

Acta Orthopaedica DOI:10.3109/17453674.2015.1089023.

Sir – We read Øye et al.'s article (Øye et al. 2016) with great interest. On reviewing our patient cohort presenting with dislocating patellae mainly in adolescents and early adulthood, of those with trochlear dysplasia (TD) as defined by Henri Dejour on lateral plain radiograph (Dejour et al. 1990), we had 4 breeches in 133 patients. The breech presentation rate in the United Kingdom is essentially the same. The key to Øye et al.'s paper is the definition of TD; a femoral sulcus angle of >157° on ultrasound (Oye et al. 2015). We have no experience of ultrasound use in neonates, but we have undertaken a study on children and adolescents (Toms et al. 2009) which concluded "In patients with patellar instability, CT and MR are reliable techniques for measuring the femoral sulcus angle but US, particularly of the articular cartilage, is not. MR is therefore the most suitable tool for longitudinal studies of the femoral sulcus." We were interested in using ultrasound to monitor changes in the femoral sulcus during the final growth spurt in at risk patients.

We would argue that the evidence of an association between breech presentation and trochlear dysplasia is far from secure since Øye et al. rely on a definition of TD that has only been validated by themselves. We recognise that patients may have TD without having a patellar dislocation, and that this might explain the differences in our findings. However, our cohort were patients with significant TD (McNamara et al. 2015) most of whom underwent a trochleoplasty. It is curious that the breech presentation rate for symptomatic significant TD should match the background rate when patients finally present with patellar instability in early adulthood since one would expect this group to have the highest risk of breech presentation.

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Sir – We appreciate Donell and Watts interest in our article (Øye et al. 2016). They raise 3 issues to be addressed. The first issue questions the use of ultrasound for measuring the femoral sulcus angle (SA) with references to their own articles (Toms et al. 2009, McNamara et al. 2015) comparing CT, MR and US for this measurement. Second, they question our definition of trochlear dysplasia in new-borns. The last issue to be questioned is their findings of only 4 breeches in a cohort of 133 patients with trochlear dysplasia (Toms et al. 2009, McNamara et al. 2015), a number matching the background rate of breech presentation in the United Kingdom. According to our findings they had expected to find a higher number of breech presentations in this cohort.

One of our fundamental goals was to see whether trochlear dysplasia is congenital or not. To address this we had to define the normal anatomy and the natural variances of the femoral trochlea in a new-born population. US is the only possible method examining a population of new-borns (CT, with radiation exposure, and MR requires general anaesthesia). US has been used earlier by other authors, for instance Nietosvaara in 1994 in his ultrasonographic study of the femoral sulcus in children 0 to 18 years of age (Nietosvaara 1994) and Mizobuchi et al. in a study of 40 infants up to 2 years of age (Mizobuchi et al. 2007). Our results are similar to those of these authors. In our earlier article "Mapping of the femoral trochlea in a newborn population: an ultrasonographic study" (Oye et al. 2015) we have meticulous evaluated our use of US and present a separate intra-observer and inter-observer repeatability study. As to the findings of Donell and Watts comparing CT, MR and US in a population of 24 patients ranging 12 to 44 years of age we find their results and conclusions not applicable to our new-born population of new-borns.

The second issue raised by Donell and Watts is our definition of trochlear dysplasia as a sulcus angle of > 159°. The anatomy of the trochlea in a new-born population has not been described, with US we found a mean value for the sulcus angle to be 148°. Our results are new and the most reasonable limit defining dysplasia was set to mean + 2SD, giving a border value of 159°. We think that this threshold is rather high than low. In their cohort with patellar instability Donell and Watts found a mean cartilage femoral sulcus angle of 158° with US. As we stated in our previous paper (6) our limit should be regarded as an estimate and further studies

DOI 10.3109/17453674.2016.1146512

on other and larger populations are needed to define the limit more robustly.

The last issue is the low number of only 4 breeches in their cohort of 133 patients (McNamara et al. 2015). We are a bit confused by which cohort they describe; their article report 90 patients with 107 operated knees. The findings of 4 breeches were made by review of this cohort. No information regarding breech presentation was made in their original work. The average age at the time of operation was 23 years. It would be helpful to know how the data regarding breech were obtained.

We plan to undertake a new survey of our cohort to see if the sulcus angle changes during growth. We are convinced that frank breech presentation is associated with a shallow femoral trochlea at birth. What remains to be revealed is if this shallow trochlea persists and causes the femoral dysplasia common in patellofemoral instability patients.

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Sir – We appreciate Øye, Foss, and Holen's response to our letter. Our only purpose was to raise a note of caution. We cannot say whether their ultrasound technique demonstrates trochlear dysplasia in neonates or not, but stressed the point that it does not work well in pre-pubertal adolescents. Our conclusion from their work is that more studies are needed to verify or refute it, preferably from independent sources. Finally, patients presenting to the Patella Clinic are asked about their birth history. Most come with parents who confirm it. One question is specifically whether the presentation was breech. The data comes from the database, not from the reported cohort (McNamara et al 2015) and therefore includes those patients with severe trochlear dysplasia who were excluded from the analysis.

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