Letter to the Editor

The Cam-type Deformity of the Proximal Femur Arises in Childhood in Response to Vigorous Sporting Activity

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To the Editor

We applaud Siebenrock et al. for their article, “The Cam-type Deformity of the Proximal Femur Arises in Childhood in Response to Vigorous Sporting Activity” [10]. The article provides some of the first strong contemporary evidence in support of a highly plausible hypothesis regarding the etiology of cam morphology involved in femoroacetabular impingement (FAI). As the authors recognize, the idea that vigorous sporting activity in young athletes predisposes to the development of cam morphology was originally proposed by Murray and Duncan in 1971 [7] and more recently by Hogervorst et al. [4]. Although the amount of clinical research for various treatment methods for FAI has increased exponentially in recent years [3], there is a lack of studies regarding how the underlying morphologic features arise. Nevertheless, where orthopaedic publication lacks, anthropologic literature delves deep into the structure of the proximal femur and offers a broad ontologic perspective of morphologic features of the hip [6]. In the evolution from sprawling

quadruped to upright man, a rounder femoral head often has been associated with smaller, tree-climbing creatures and a flatter, aspherical femoral head with larger, cursorial animals [9]. We suspect the shape of the hip is guided by a balance between the demands for ROM and axial loading, and that adolescent activities that require hip flexibility and strength might protect against the development of cam morphology. However, the physis and its supporting structures have an ability to adapt to various loads [5, 11, 12] and may contribute to cam morphology [4, 10] in response to shear stress across the physis with loading during agility sports [8]. Axial stress on the hip is not attributable solely to a ponderous body mass, but also to the magnitude of muscular forces acting across the joint [2]. The development of cam morphology and the radiographic basis for the development of FAI contrast to the later development of clinical FAI, where repetitive or prolonged impingement-type motions cause abutment and exacerbate symptoms. Similar to the association between constitutional knee varus and increased impact sports during growth [1], cam morphology likely represents a characteristic musculoskeletal trait secondary to natural adaptation to specific demands during adolescence. Although it might predispose individuals to clinically symptomatic FAI and early degenerative joint disease, the development of cam morphology is not necessarily a pathologic process in itself. When viewed primarily from a treatment standpoint, cam morphology often is deemed a deformity. However, when placed in the broader context of evolutionary history and biomechanical forces, it might simply represent a human anatomic variant reflecting the wide spectrum of activity levels among individuals, the ability of the human body to modulate its form, and the potential limits of this ability to create a long-lasting, yet universally high-functioning hip.

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