

CORR Insights

Reliability of Bucholz and Ogden Classification for Osteonecrosis Secondary to Developmental Dysplasia of the Hip

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Abstract This CORR Insights™ is a commentary on the article “Reliability of Bucholz and Ogden Classification for Osteonecrosis Secondary to Developmental Dysplasia of the Hip” by Roposch and colleagues available at DOI [10.1007/s11999-012-2534-x](https://doi.org/10.1007/s11999-012-2534-x).

Where are we now?

For clinicians treating developmental dysplasia of the hip (DDH), the complication of osteonecrosis, sometimes referred to as aseptic necrosis, is considered the most disastrous complication of either closed or open treatment. As there has never been a study of a pathologic specimen from a patient having osteonecrosis in this condition, I prefer to call this “proximal femoral growth disturbance”. These growth disturbances have been produced in experimental animals by various vascular injuries and they resemble what is seen in humans. Growth disturbances can occur as a result of vascular injuries and or pressure injuries to the epiphysis or to the physal plate. These abnormalities only occur in treated patients. The etiology of these growth abnormalities remains speculative with

such factors as the use or lack of use of prereduction traction, the position of immobilization, patient age, and the force used for reduction offered as explanations. While many classifications have been developed for osteonecrosis (eg, Salter et al; Kalamchi and MacEwen; and Bucholz and Ogden), few studies have documented validity.

Where do we need to go?

The article by Roposch et al. tries to address one of the main shortcomings in the DDH literature, the validity of a classification widely used to assess DDH treatment: the Bucholz and Ogden classification of osteonecrosis after treatment for DDH. Disappointingly, the interrater and intrarater reliabilities were poor for this widely used classification. This further compromises the validity of the existing evidence base used by pediatric orthopaedic surgeons to make treatment decisions based on what the literature says about the incidence of the various types of osteonecrosis as judged by the Bucholz and Ogden classification after various forms of treatment for DDH. It raises many other questions regarding the use of any classification system that lacks validity to make treatment decisions. Radiographs represent only a single picture in time of the developing hip. Images are dependent on hip rotation, status of hip development and ossification, and most importantly, they represent a two-dimensional picture of a three-dimensional condition. Intuitively, any proximal femoral growth disturbance may jeopardize long-term hip outcome, but followup studies to date seem to indicate that children who experienced a growth disturbance of the proximal femur after treatment for DDH may do very well clinically for many decades before development of osteoarthritis in their affected hip.

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How do we get there?

It is clear that despite basic understanding of the growth and development of the proximal femur and its blood supply, we have much to learn about growth disturbances of the proximal femur that occur after closed or open treatment of DDH and their effect on acetabular development and congruency. We need to know how many of these disturbances are attributable to pressure or damage to the epiphyseal cartilage that may occur from the mere position of the dislocated hip in

reference to the acetabulum or pelvis, independent of treatment. We need to learn, from animal models preferably, what factors used in current open and closed treatment methods put the epiphyseal and physeal cartilage at risk for developing growth disturbances. Finally we need to further understand the relationship of proximal femoral growth disturbances to clinical outcome and what factors we as surgeons may bring to bear that can influence an otherwise adverse outcome in a positive way.