



## CORR Insights

**CORR Insights®: Is Age or Surgical Approach Associated With Osteonecrosis in Patients With Developmental Dysplasia of the Hip? A Meta-analysis**

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**Where Are We Now?**

The study by Novais and colleagues examines two hotly debated questions: Are older patients with developmental dysplasia

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of the hip (DDH) at greater risk for osteonecrosis when undergoing closed or open reduction, and does the surgical approach influence this risk? Traditional teaching on these topics is rooted as much in dogma as science, and most practicing clinicians likely follow the beliefs of their training programs.

I believe that for hips undergoing open reduction, achieving concentric reduction with a stable hip and avoiding osteonecrosis likely are the main factors in accomplishing the best long-term hip function and radiographic results. Open reduction for hip dysplasia can be indicated in patients

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where there has been either a failure of early management or failure of hip screening (resulting in late detection). Sometimes open reduction is delayed until bone in the femoral head can be seen in a radiograph. There is a possibility that the hip is too fragile before this bone appears and that closed reduction may impair the growth of the hip. On the other hand, delaying this procedure until the child is older may result in stiffness and more abnormality of the hip joint, reducing the effects of treatment. Researchers cannot agree on whether waiting for this bone to appear helps protect the hip from damage during reduction. There is no way to know if damage to the blood supply of the hip or damage to the growth plate has occurred for at least 6 months after the closed reduction since one has to wait for the radiographic capital epiphysis to appear and monitor its growth to identify these findings.

Surgical approach remains a matter of training and personal preference. Proponents of either approach (medial or anterior) purportedly have strong

reasons to pursue these individual approaches. There are risks and specific limitations involved with both approaches, but clearly evidence as presented by Novias and colleagues does not favor any specific approach.

## Where Do We Need To Go?

Early diagnosis of avascular necrosis or osteonecrosis for patients in infancy is difficult and imprecise. It is ironic that hip dysplasia (which is a three-dimensional (3-D) ball and socket coverage problem) and osteonecrosis (which is a vascularity issue to the femoral head) currently are best diagnosed and monitored with plain radiography, a two-dimensional modality that remains somewhat circumstantial and not detail oriented. Despite several advances in deep-ultrasound technology, and the ability to perform 3-D ultrasound, as well as ultrasound-based deep-tissue vascularity assessment, these approaches remain more of academic and research

interests than being applied clinically in a wide-spread manner.

It seems to me that any approach we use should provide detailed information about hip anatomy and minimize the amount of radiation that these infants and children receive. We also need to define population norms in order to develop diagnostic criteria for the dysplastic hip based on this new approach. Finally, any new modality will need to be compared to our existing tools, such as plain radiography.

## How Do We Get There?

The current study by Novais and colleagues shakes up some of the myths associated with managing patients with hip dysplasia. Some of these include previous unfounded notions of waiting longer (for sometimes up to 18 months of age) for performing open reduction of hip or avoiding possible medial open reduction in so-called younger patients.

But, as I noted earlier, future studies need to compare nonradiation-based

advanced ultrasonic diagnostic tools, and evaluate their performance in real-world populations, both of children with known DDH and osteonecrosis, as well as children being screened for those conditions. Specifically, these studies should help establish the true 3-D spectrum of femoroacetabular coverage at birth and its subsequent evolution in infancy, identify the true role of superolateral component of undercoverage (which currently is the main element being used for defining and monitoring DDH), and help establish guidelines and recommendations for treatment. This would be more applicable in the so-called dysplastic stable hips, which in my opinion, are being excessively over-treated all around. In truly dislocated hips, this would prove to be valuable for achieving the eventual best outcome of concentric reduction with a stable hip and avoiding osteonecrosis as much as possible with extreme positions, thereby helping to accomplish the best long-term hip functional and radiographic results.