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CORR Insights®: Iatrogenic Hip Instability Is a Devastating Complication After the Modified Dunn Procedure for Severe Slipped Capital Femoral Epiphysis

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Where Are We Now?

The authors of the current study describe a sobering complication—hip instability/dislocation

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tion after performing a modified Dunn procedure on children with severe slipped capital femoral epiphysis (SCFE). This multicenter study noted a 4% prevalence of postoperative hip instability after the procedure, likely a conservative estimate for this devastating complication. More sobering is the fact that 14 of the 17 patients with this complication developed avascular necrosis (AVN), with three patients having already undergone THA at a short-term followup mean of only 2 years. It is well known that AVN from a SCFE is a hip-destructive event [2].

How did we get here? The modern definition of a SCFE is either stable or unstable [4], with the vast majority being stable. The risk for AVN in the unstable SCFE is extremely low, probably less than 1%. The risk of

AVN in the unstable SCFE by contrast is high, perhaps in the neighborhood of up to 50%. The concern for the stable SCFE, especially the severe SCFE, is the long-term risk of degenerative hip disease resulting in the need for hip arthroplasty. Both outcomes (AVN or degenerative hip disease) are ones that all orthopaedic surgeons wish to avoid.

Out of these adverse outcomes came the “hip-preservation movement” [3]. In the last decade, the movement, with its altruistic motives, has spread across the orthopaedic community like a flood. It is in this context that the modified Dunn procedure for SCFE became popular. It was the hope that such a procedure would markedly reduce the incidence of AVN in the unstable SCFE, as well as minimize the long-term risk of degenerative hip disease in the severe stable SCFE.

The initial results of such procedures from Switzerland were promising [8, 12], yet more recent studies outside of Europe have noted a higher risk of

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complications [6]. Iatrogenic hip instability received little attention in hip-preservation studies from Europe.

High AVN and complication rates have now been brought to our attention thanks to remarkably honest reporting. This questions the entire concept of “hip preservation” in the initial treatment of SCFE: Is it data-proven, or just a catchy name?

Where Do We Need to Go?

Orthopaedic surgeons must know the true, accurate incidence of all complications (both major and minor) from the modified Dunn osteotomy for SCFE. These complications should be categorized according standardized guidelines [7]. Examples of major complications would be AVN, hip dislocation (as described in this study), nonunion, and implant failure. Examples of minor complications include mild heterotopic ossification, and scar numbness. Such complication rates need to be compared to the rates that are well known for established treatments with SCFE. For instance, the AVN rate in stable SCFE is less than 1%; if the Dunn osteotomy leads to a rate higher than this, then the procedure needs to be abandoned for patients with stable SCFE as the natural history for a stable SCFE, even if severe, is gradual deterioration and

development of degenerative hip disease. This will obviously result in the need for hip arthroplasty 20 to 30 years later [1] except when AVN occurs early, which was the most-common indication for hip arthroplasty among patients being treated for SCFE at the Mayo Clinic [2]. This is especially important to note, since the outcome of hip arthroplasty in SCFE patients is excellent [5]. Regarding the unstable SCFE, the overall AVN rate was ~26% in a meta-analysis [11]. More importantly, the AVN rate from simpler procedures, such as a mini-limited open reduction and fixation or closed reduction and fixation with decompression resulted in an AVN rate < 15%. Therefore, any major surgical reconstruction, such as the modified Dunn osteotomy, in the case of an unstable SCFE, needs to improve upon this ~15% baseline incidence of AVN.

How Do We Get There?

The International SCFE Study Group from which this manuscript arose is an excellent start. Owing to the rarity of SCFE cases “needing” a modified Dunn osteotomy (either an unstable SCFE or a severe stable SCFE), no single center can accumulate an adequate number for any meaningful outcome data. Only by pooling the data from many centers will there be

enough information to arrive at meaningful conclusions. In addition, I would suggest that only a few centers—those having the technical expertise as well as adequate volume—should perform or study the modified Dunn osteotomy [9, 10]. This should help minimize the risk of complications. Also, it is of utmost importance that the International SCFE study group collects and analyzes the results of this procedure frequently, preferably every 6 or 12 months after the procedure. Such results should be reviewed by an independent examiner. If the results of the modified Dunn osteotomy surpass those from previous, simpler procedures, then the study should be continued. If the results are worse, then the modified Dunn osteotomy should be abandoned, because rather than being hip-preserving, it is hip-destroying. In fact, this report may be enough evidence for some surgeons to abandon the procedure now, as there are many other treatment methods for the severe stable SCFE (flexion intertrochanteric osteotomy, which has a low risk of AVN and has not been associated with later hip dislocation) and the unstable SCFE (gentle repositioning with screw fixation and joint decompression, which has a risk of AVN rate < 15%, and no apparent risk of hip dislocation). As physicians, our first obligation is to do no harm.

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