Emerging Concepts in Slipped Capital Femoral Epiphysis

Editorial Comment

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Published online: 21 May 2013

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Slipped capital femoral epiphysis (SCFE) is the most frequent acquired hip deformity that affects adolescents. Its prevalence is increasing in proportion to the increasing obesity rates found in many populations worldwide. The historical evolution of SCFE treatment has reflected our understanding of the natural history of the disorder and has closely paralleled cognitive and technical advances in orthopaedic surgery. The most common treatment of SCFE, in-situ pinning, is largely based upon classic followup studies performed at the University of Iowa. The treatment approach has changed little in the past 30 years [1, 2, 6]. In-situ fixation, now performed with decompressive arthrotomy or joint aspiration in cases of unstable slip, has evolved with the development of cannulated screws and improvements in intraoperative imaging. Despite a lack of data regarding complications and accurate

outcome measures following techniques of in-situ fixation, more complex procedures to realign the epiphysis have largely been eschewed in favor of in-situ pinning that has been historically associated with fewer postoperative complications [6]. Recently, strong evidence has been presented that suggests at least 10% of hips treated by in-situ pinning for SCFE fail early following treatment and one-third more have complaints of stiffness and pain [4, 9]. Conservative estimates suggest that approximately one-fifth of hips are considered clinical failures after approximately 10 years [4]. These figures suggest that orthopaedists have room to improve the treatment of this disorder, and that conclusions of the previous clinical studies upon which our treatment were based may be affected by the methods used to measure clinical performance and hip function.

The modern concept of femoroacetabular impingement causing chondrolabral damage has become an accepted principle of hip pathomechanics. SCFE is considered a prototype for understanding hip impingement. It is now appreciated that, along with the femoral deformity that leads to combinations of CAM-type and pincer-type femoroacetabular impingement, acetabular morphology is also a critical determinant of impingement-free ROM. Additionally, exposed metaphyseal bone, even in “mild” SCFE, can rapidly damage chondral structures. MR imaging and clinical evidence substantiate nearly universal early anterior acetabular cartilage damage that is proportional to the degree of femoral deformity [11].

Improved understanding of the applied anatomy of the medial femoral circumflex artery and epiphyseal perfusion, the development of anterior hip approaches, and safer hip dislocation surgical procedures, have expanded the range of surgical methods that can be applied to treat both unstable and stable SCFE. The advent of hip arthroscopy

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permits a less invasive method of evaluating and treating both the central compartment effects and metaphyseal deformity associated with SCFE. Experienced surgeons may choose between traditional in-situ fixation, metaphyseal osteoplasty, modified Dunn, transcervical, or intertrochanteric osteotomy when managing a SCFE patient. While the precise roles for these procedures have yet to be defined, recent clinical and pathologic observations suggest the need to reassess historical attitudes towards treating all SCFE with the same method [3, 5, 8, 10].

Pediatric orthopaedic surgeons now face a paradigm shift in the treatment of a disorder that was once considered straightforward. We are increasingly presented with complex patients, often obese and with long-standing severe deformities (Figs. 1, 2). We are at a crossroad in our profession that can

only be addressed by a collective scientific and educational effort. First, we must be in the forefront in the fight against obesity [7]. Second, we must emphasize to primary care providers the importance of early diagnosis of SCFE by simple screening methods to prevent severe disease. Third, we must design methods that can be used to accurately assess and categorize femoral and acetabular morphology in SCFE so that the mechanical effects of each deformity are predictable. Fourth, we must train surgeons in advanced techniques of hip reconstruction who can responsibly apply newer treatment modalities to complex hip disorder. Fifth, we must design treatments for hips affected by osteonecrosis or early arthrosis, though more frequent early diagnosis will likely reduce greatly the risk of these complications. Finally, we must carefully and prospectively follow and study the patients with SCFE deformity.

It is clear that we have an opportunity to improve the quality of life and well being of countless children by reducing the morbidity of this serious and increasingly common orthopaedic problem of international proportions.

Fig. 1 Dr. Michael B. Millis is shown.

Fig. 2 Dr. Ira Zaltz is shown.

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