

Letters to the Editor

Iatrogenic Labral Puncture of the Hip Is Avoidable

To the Editor:

We read with great interest the recent article by Badylak and Keene¹ regarding iatrogenic labral puncture during hip arthroscopy. This study reported that the labrum was penetrated in 20% of cases and concluded that the iatrogenic labral injury did not affect the 1- and 2-year clinical results. We applaud the authors' candor in reporting this complication in a total of 50 patients and value the contribution of this article to the nascent body of literature on safe procedures in hip arthroscopy.

Indeed, labral injuries are reported as a complication of hip arthroscopy in the literature and may occasionally occur during hip arthroscopy despite the surgeon's best efforts to achieve safe access.²⁻⁴ However, we fear that this article may unintentionally convey to the reader that a high rate of labral penetration is not a cause for concern. For this reason, we would like to emphasize to the readers that labral injury is not a normal part of hip arthroscopy and should be avoided when possible. According to our experience, it is possible to perform hip arthroscopy with a low incidence of labral penetration by following a simple safe technique for portal establishment during hip arthroscopy. Using this technique in a series of 300 consecutive cases, we have reported 2 labral penetrations (rate of labral injury, 0.67%).⁵ One injury occurred during revision arthroscopy, whereas the second involved a hyperplastic labrum in a dysplastic hip.

The safe technique that we use follows 2 basic principles to keep the labrum intact. The first is to vent the joint with the spinal needle and then to withdraw and re-enter the joint (Fig 1, Video 1, available at www.arthroscopyjournal.org). Venting the joint releases the negative intra-articular pressure, allowing greater distraction before entry with the cannula and arthroscope. The second principle is to consider the beveled side of the spinal needle as the "safe side"; tissues on the beveled side are retracted away and not penetrated (Fig 2). The safe side of the bevel may be used to pass first the labrum and then the femoral head during joint entry.

According to Badylak and Keene,¹ 4 types of labral penetration occurred: (1) penetration through a labral tear (5 cases); (2) penetration adjacent to a labral tear, making the tear longer (5 cases); (3) partial penetration next to the labrum edge (5 cases); and (4) full penetration of the labrum

not continuous with a labral tear (35 cases). All cases with labral tears (47 cases) were treated with excision of the tear. Hence the first 3 options did not significantly change the result of the treatment. As for the fourth group, in which the iatrogenic tear was not near the native labral tear, the new tear was left untreated. Considering evidence that labral debridement has inferior results compared with labral refixation,^{6,7} the effect of the iatrogenic labral injury in this group may be masked.

Another limitation of the study that has to be considered is the ceiling effect of the modified Harris Hip Score. Because 60.5% of this score consists of pain tolerance and subjective perception of limp, it is limited in evaluating some patients, especially those who have very high scores preoperatively. This ceiling effect may disguise the detrimental effect of iatrogenic labral penetration.

Overall, the acetabular labrum plays an important role in the hip joint. It has been shown to increase articulating surface by 22% and acetabular volume by 33%.⁸ While in the weight-bearing phase, the labrum seals synovial fluid between the femoral head and acetabulum, driving it into the articular cartilage, providing nutrition and lubrication.⁹ The pressurized synovial fluid also transmits the load within the cartilage layers to the underlying subchondral bone and slows the expression of fluid out of the cartilage matrix, reducing the solid contact stresses on the cartilage.¹⁰⁻¹² Loss of the labral seal has been shown to destabilize the hip in a cadaveric model, increasing femoral head motion with both venting of the capsule and creation of a labral tear.¹³ Clinically, tears of the labrum are believed to lead to accelerated wear of the articular cartilage, as well as early degenerative osteoarthritis.¹⁴⁻¹⁶

Complications are inevitably under-reported in the surgical literature, and the courage of Badylak and Keene¹ in presenting this complication deserves recognition. However, their conclusion that labral penetration does not affect clinical outcome may be misinterpreted by the reader, who may be led to believe that a high rate of iatrogenic labral injury is acceptable. In our opinion, iatrogenic damage to the labrum does matter and may affect the short- and long-term surgical results.

In summary, there is an overwhelming body of evidence that the labrum serves an important function in the healthy hip joint. For this reason, iatrogenic damage to the labrum must be considered undesirable, and every effort should be made to avoid labral penetration during hip arthroscopy. In light of the observed labral penetration rate of less than 1% in a series of 300 patients, we find the 20% labral penetration rate reported in this study to be quite high. We would therefore offer that the

Note: To access the video accompanying this letter, visit the March issue of *Arthroscopy* at www.arthroscopyjournal.org.

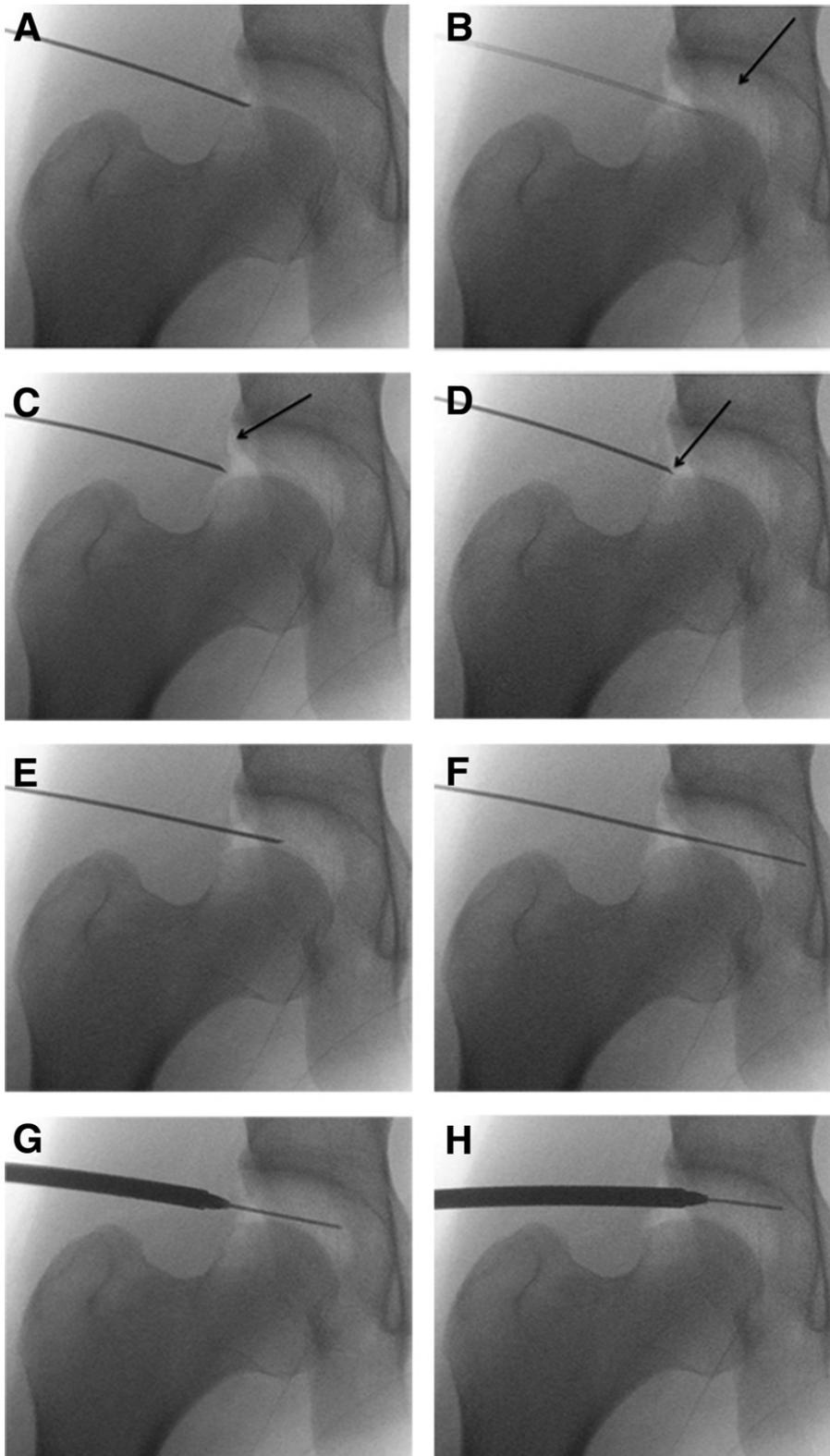


FIGURE 1. (A) A 14-gauge spinal needle is introduced at the anterior-lateral portal and advanced with the bevel, which is the “safe side,” facing toward the femoral head. (B) The stylet is removed to vent the joint, creating an air arthrogram (arrow) and increasing distraction. (C) The needle is withdrawn outside the capsule (arrow) and reinserted with the safe side facing the labrum to prevent labral penetration. (D) The needle is gently advanced until a “pop” is felt. The tip of the needle should be intracapsular (arrow). (E) The needle is rotated 180° and advanced into the joint with the safe side facing toward the femoral head to prevent scuffing. (F) A nitinol wire is passed through the needle until it makes contact with the acetabular wall; the needle is then withdrawn and the wire left in place. (G) A dilator is passed over the nitinol wire, aiming parallel to the joint line just above the femoral head and inferior to the labrum. (H) After the dilator penetrates the capsule, the surgeon aims it away from the femoral head to avoid scuffing the femoral head.

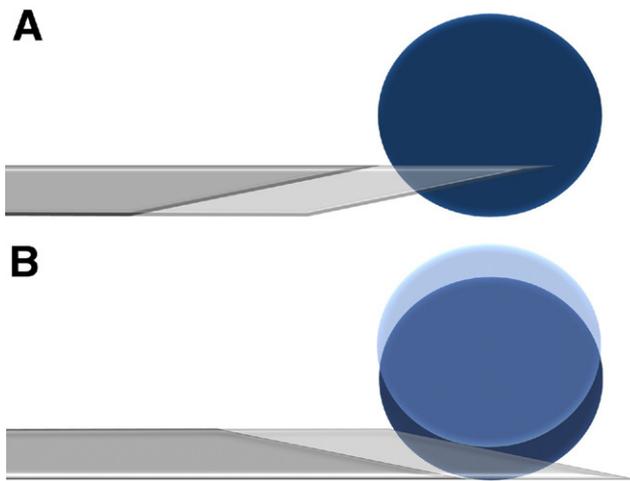


FIGURE 2. Illustration of “needle safe side” principle. (A) The tip of the needle, the “sharp side,” is pointing toward the object; as the needle is advanced, it is penetrating the object. (B) The bevel side, which is the “safe side,” is facing toward the object; as the needle is advanced, the object is pushed away.

reader may aim to minimize the iatrogenic labral injury in hip arthroscopy and may consider a labral penetration rate of less than 1% to be a realistic goal.

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Author's Reply

We appreciate Domb and Botser's review and comments regarding our article on iatrogenic punctures of the labrum. The main issues they raise are that labral injuries are not a normal part of hip arthroscopy; that untreated iatrogenic punctures may lead to loss of the labral seal and inferior results similar to those reported with labral debridement versus labral refixation; and that the use of the modified Harris Hip Score (MHHS), with its ceiling affect for those with high preoperative scores, may mask the detrimental effects of iatrogenic labral penetration. We believe these issues merit further comment.

First, Domb and Botser report that with the hip arthroscopy entrance technique they present in their letter, they have achieved a 0.67% iatrogenic labral puncture (ILP) rate in 300 consecutive cases. This is commendable, and our only question would be as follows: Was this assessed in Domb and Botser's first or most recent 300 patients? The 50 patients with ILPs reported in our article occurred among the senior author's first 250 patients. The senior author has performed 550 subsequent hip arthroscopies, and in the last 300, the ILP rate was 1.7%. Thus we agree that a labral penetration rate of less than 1% is a realistic goal. However, the