

The “Bird’s Eye” and “Upper Deck” Views in Hip Arthroscopy: Powerful Arthroscopic Perspectives for Acetabuloplasty

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Abstract: Arthroscopic acetabuloplasty involves trimming of bone from the acetabular rim. Although early techniques often involved detachment of the labrum prior to bone resection, recent studies have reported on acetabuloplasty without labral detachment. This method has the benefit of preserving the labro-osseous junction, but visualization of the acetabular rim may be more difficult. Compromised visualization can lead to incomplete resection and residual impingement. We describe an arthroscopic perspective called the “bird’s eye” and “upper deck” views that facilitates optimal visualization of the acetabuloplasty without labral detachment.

The use of hip arthroscopy as a treatment for conditions such as labral tears or femoroacetabular impingement (FAI) has increased significantly in recent years.^{1,2} The number of revision arthroscopies has also increased. The most common reason for revision after primary hip arthroscopy is residual impingement. A systematic review showed that of 348 hips that were revised, 81% had residual FAI (combined 56%, cam 34%, and pincer 10%). Femoroplasty was performed

on the patients with cam-type residual impingement, and acetabuloplasty was performed on the patients with pincer-type residual impingement.³

Avoiding technical errors like residual FAI requires adequate visualization of the femoral neck and acetabular rim. There has been strong emphasis on proper execution of femoroplasty and labral repair. Appropriate and accurate acetabuloplasty requires similarly fastidious technique. Complete resection of pincer impingement is important to restore function of the hip. The rationale for acetabular rim trimming is to directly address the offending pathology causing the impingement as in pincer-type or combined-type FAI, and to protect repaired labrum from further

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Fig 1. Beak of bone visualized using upper-deck view.

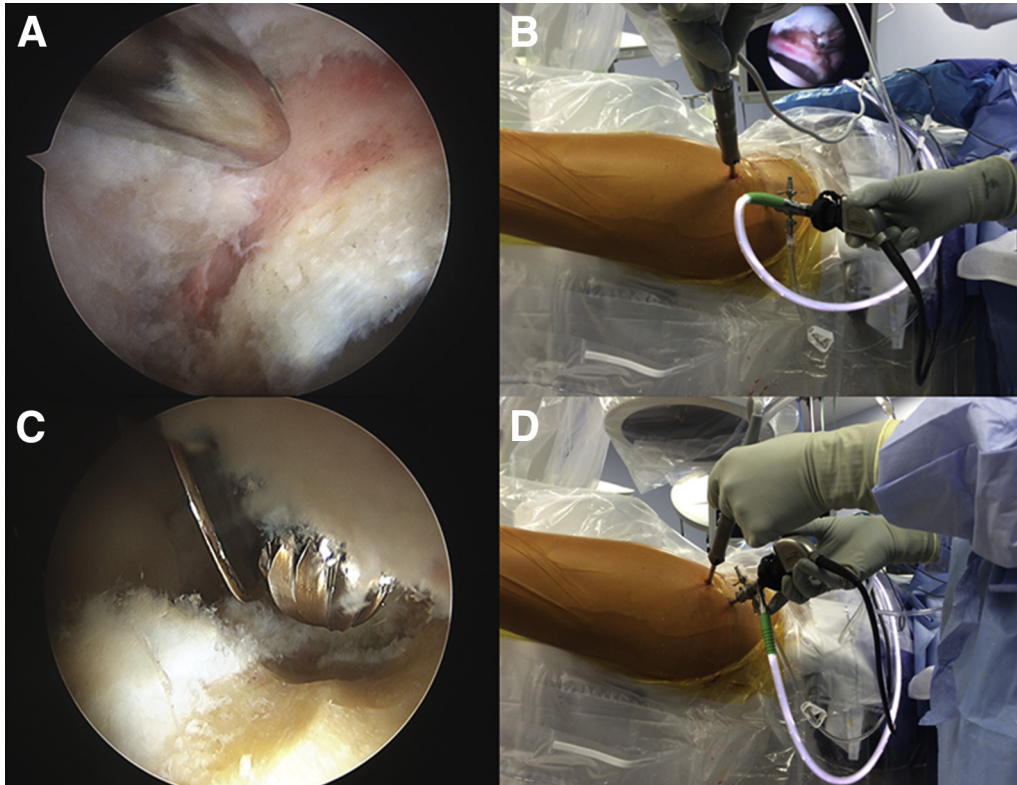


Fig 2. (A) Acetabuloplasty using the bird's-eye view and (B) light source of the scope at 9 o'clock for a left hip while performing acetabuloplasty where the scope is at the peripheral compartment at the level of the capsulotomy. (C) Acetabuloplasty using the upper-deck view, and (D) light source of the scope at 6 o'clock for a left hip while performing acetabuloplasty, where the scope is between the capsule and labrum viewing the labro-osseous junction.

impingement.⁴⁻⁶ When the acetabulum is inadequately resected, patients continue to be at risk for impingement or labral tear. Therefore, techniques that improve visualization of the acetabuloplasty will decrease the chances of revision surgery.

Without adequate visualization of the labro-osseous junction, there is a risk of inadequate resection that leaves a lingering beak of bone (Fig 1). This leads to

increased risk of residual impingement and micro-trabecular impaction fractures, which are additional causes of pain. Recent technique modifications have made possible acetabuloplasty without labral detachment,⁷⁻⁹ and subsequent labral repair. However, this technique may increase the risk of incomplete acetabuloplasty when conventional arthroscopic views are used. This has led to the development of the "upper deck" and "bird's eye"

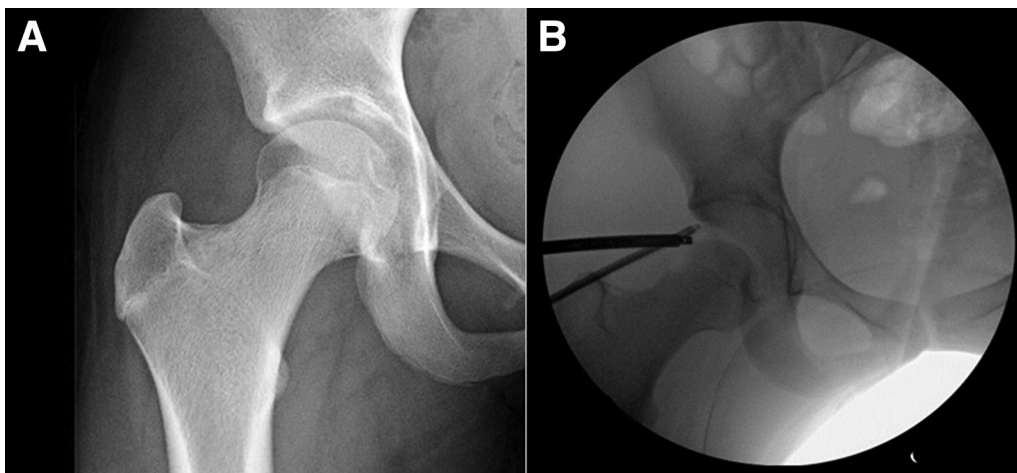


Fig 3. (A) Preoperative right hip radiograph with lateral overhang and crossover sign and (B) fluoroscopic examination after acetabuloplasty using upper-deck technique shows no evidence of lateral overhang.

Table 1. Advantages of Using the Upper-Deck and Bird’s-Eye View Technique During Acetabuloplasty

Bird’s-Eye and Upper-Deck Views Technique Advantages
Simple technique
Not time consuming
Best visualization of the labro-osseous junction
Confirms complete resection of pincer lesion
Avoids residual impingement
Avoids leaving a beak of bone at the labro-osseous junction that may be susceptible to microtrabecular fractures

views, arthroscopic perspectives that allow visualization of the labral-osseous junction without detachment of the chondrolabral junction.

We present here a technique that prevents residual pincer impingement by improving arthroscopic visualization during acetabuloplasty. The bird’s-eye and upper-deck view described allows for optimized acetabular rim trimming and efficient removal of crossover sign and anterolateral overhang in patients with pincer impingement.

Technique

Preoperative Preparation

Preoperative preparation begins with placing the patient in the modified supine position on the Advanced Supine Hip Positioning System (Smith & Nephew, London, United Kingdom), in slight Trendelenburg, with a well-padded perineal post.

Arthroscopic Access and Portal Placement

A spinal needle is introduced into the joint to vent and allow distraction. Traction is first pulled on the nonoperative leg and then applied as needed to the operative leg at a maximum of 50 lb.

The hip joint is accessed through the anterolateral, anterior, and distal anterolateral accessory portals as described by Domb et al.¹⁰ Interportal capsulotomy is done in every case.

Diagnostic Arthroscopy

Diagnostic arthroscopy assesses the ligamentum teres, psoas impingement lesions, chondral damage, and labral size and pathology. The measurements of lateral center-edge angle, anterior center-edge angle, crossover percentage, anterolateral overhang, ischial spine sign, and posterior wall sign on preoperative radiographs determine the amount of rim trimming needed for pincer-type impingement.

Bird’s-Eye View Acetabuloplasty

Once the necessity of acetabuloplasty is confirmed, the capsule is elevated from the pincer lesion using the ablator radiofrequency wand. Next, rim trimming is performed with a 70° Direct View Arthroscope (Smith & Nephew) scope using the bird’s-eye view from the peripheral compartment. The light source is positioned

Table 2. Pearls and Pitfalls of the Upper-Deck and Bird’s-Eye View

Pearls	Pitfalls
Complete capsulotomy for adequate positioning of scope and burr	Incomplete capsulotomy may block motion of the instruments in the joint, making the bird’s-eye and upper-deck view harder
Distal anterolateral accessory portal provides an adequate angle to perform the rim trimming	If capsule is not elevated properly, placing the scope between the labrum and the capsule will be difficult
Capsule elevation with a radiofrequency ablator to expose all the entire pincer lesion	
Traction stitch in the proximal limb of the capsule improves visualization	
Place the scope at the level of the capsulotomy with the light source looking at the acetabular rim for the bird’s-eye view	
Place the scope between the labrum and capsule for the upper-deck view	
Final rim trimming should be done using the upper-deck view with emphasis on the labro-osseous junction, making sure not to detach the labrum and eliminating the residual beak of bone	

at 3 o’clock (right hip) or 9 o’clock (left hip) in the anterolateral portal and the 5.5-mm burr in the distal anterolateral accessory portal (Fig 2 A and B).

Upper-Deck View Acetabuloplasty

After rim trimming using the bird’s-eye view, the upper-deck view is used with the scope supralabral but intracapsular and the light source positioned at 6 o’clock. Residual impinging bone can be removed using this view (Fig 2 C and D; Video 1). Fluoroscopic visualization is used during each view to eliminate until the crossover sign is eliminated and to trim the pre-templated amount of bone from the acetabulum (Fig 3). After the pincer impingement is completely removed, additional procedures will be completed as needed according to the diagnostic arthroscopy findings.

Discussion

The bird’s-eye view entails positioning of the scope in the peripheral compartment at the level of the

Table 3. Steps to Reach the Bird’s-Eye and Upper-Deck Views

	Bird’s Eye	Upper Deck
Scope position	Peripheral compartment	Supralabral but intracapsular
Portal	Anterolateral	Anterolateral
Light source	3 o’clock (right hip) 9 o’clock (left hip)	6 o’clock

capsulotomy with the light source looking toward the acetabular rim, whereas the upper-deck view entails positioning of the scope over the acetabular rim and below the capsule with the light source at 6 o'clock. This allows for the best visualization of the labro-osseous junction. Incomplete acetabuloplasty, which usually cannot be detected under fluoroscopy, can be corrected with use of this technique. Table 1 shows the advantages of the technique, Table 2 shows the pearls and pitfalls, and Table 3 lists the steps to reaching each view.

Decreasing technical errors is an important part of avoiding revision surgery, especially in a field with as steep a learning curve as hip arthroscopy. Philippon et al.⁴ found that 1 mm of bony resection equals 2.4° of change in the center-edge angle and 5 mm of bony resection equals 5° of change in the center-edge angle. This shows that even small amounts of residual bone can be significant when evaluating radiographic measurements for impingement. The bird's-eye and upper-deck view is a technique that can help the surgeon effectively prevent residual pincer impingement, thereby reducing the need for revision surgery. Without using these views, there will likely be residual acetabular bone that is not visible on fluoroscopy and could potentially continue to constitute impingement.

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