Technical Note

Transhumeral Head Plasty for Large Hill-Sachs Lesions

Paul Re, M.D., Robert A. Gallo, M.D., and John C. Richmond, M.D.

Abstract: Large, engaging Hill-Sachs lesions can cause recurrent glenohumeral instability following Bankart repair of torn anterior capsulolabral structures. We offer a novel technique for correcting the posterolateral humeral head defect without significantly altering normal anatomic structures. The glenohumeral joint is exposed via a deltopectoral approach. After the defect geometry is appreciated by direct palpation and visualization, the tip of an anterior cruciate ligament tibial guide is centered in the defect. The drill sleeve is approximated to the anterior lesser tuberosity starting hole, and a graduated guidewire is advanced to the posterior subchondral surface. After confirmation of satisfactory positioning, an 8-mm cannulated acorn drill is drilled to within 1 cm of the posterior surface. Bone tamps are used to elevate the depressed area using the tunnel created within the head. Allograft cancellous bone chips are impacted into the defect to elevate and support the subchondral surface. After successful impaction grafting and restoration of the head surface, anterior capsulolabral reconstruction is undertaken using either the Bankart or Latarjet technique. A standard Bankart rehabilitation program is followed postoperatively. We confirmed the clinical efficacy of our technique in 4 patients who experienced no instability or other complications at an average of 1-year follow-up. **Key Words:** Hill-Sachs lesion—Humeroplasty—Recurrent shoulder instability.

Traumatic anterior dislocations of the glenohumeral joint are often accompanied by impaction injuries of the posterolateral humeral head, so-called Hill-Sachs lesions. Following Bankart repair of torn anterior capsular structures and/or physiotherapy, most shoulders stabilize[1,2] and the Hill-Sachs lesion represents little more than radiographic evidence of a history of shoulder dislocation.

Up to 20% of patients who undergo primary Bankart repair develop recurrent instability, including both dislocations and subluxations.[2] In this population, the cause of symptoms often remains elusive. Several entities, including adhesions,[2] residual capsular laxity,[3] incomplete stabilization of the labrum,[3] glenoid rim defects,[4,5] and large impaction injuries of the posterolateral humeral head[6] have been proposed as the culprit. Although most other injuries are amenable to surgical repairs, the large Hill-Sachs lesions that contribute to instability present a daunting challenge that, even Bankart noted, "nothing can be done about them if they are found."[7] Nonetheless, various surgical procedures have been devised for the treatment of these injuries. All involve significant derangements of normal anatomic structures. In this article, we offer a novel technique for correcting the defect without sacrificing normal anatomic structures.

TECHNIQUE

We considered those suffering from primary or recurrent traumatic anteroinferior shoulder instability

From the Departments of Orthopaedic Surgery, Emerson Hospital (P.R.), Concord, Massachusetts;Allegheny General Hospital (R.A.G.), Pittsburgh, Pennsylvania; and New England Baptist Hospital (J.C.R.), Boston, Massachusetts, U.S.A.

Address correspondence and reprint requests to Robert A. Gallo, M.D., Department of Orthopaedic Surgery, Allegheny General Hospital, 1307 North Federal St, Suite 200, Pittsburgh, PA 15212, U.S.A. E-mail: august_gallo@yahoo.com

Cite this article as: Re P, Gallo RA, Richmond JC. Transhumeral head plasty for large Hill-Sachs lesions. Arthroscopy 2006;22:798.e1-798.e4 [doi:10.1016/j.arthro.2005.12.038].

0749-8063/06/2207-5264$32.00/0

doi:10.1016/j.arthro.2005.12.038

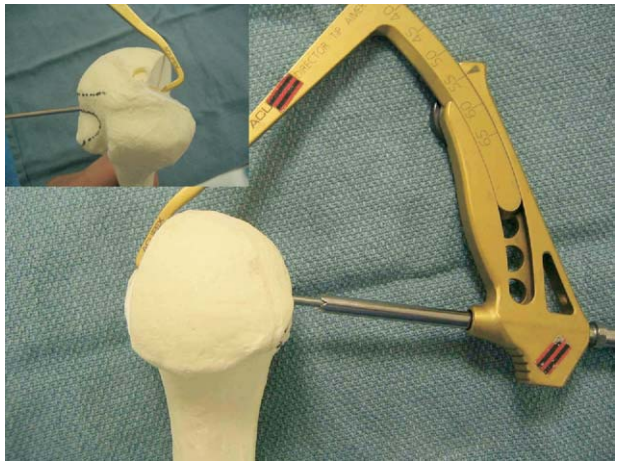

FIGURE 1. The tip of the ACL tibial guide is placed within the center of the Hill-Sachs lesion. The determination of the center of the lesion and the placement of the guide are done by palpation.

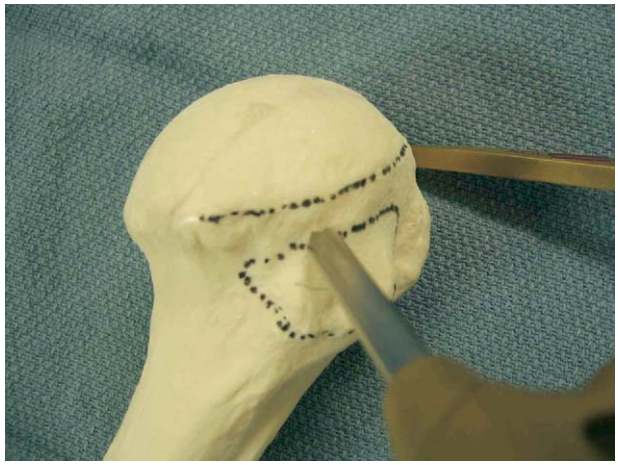

FIGURE 2. The guidewire starting point is located at the anterior humeral head equator, between articular cartilage and lesser tuberosity. This region is visualized through the standard approach used to treat Bankart lesions.

with an associated large engaging Hill-Sachs lesion as candidates for transhumeral head plasties. We performed this procedure on four patients. Concomitantly, three had a standard Bankart anterior capsulolabral reconstruction, while the other had a Latarjet procedure.

A standard deltopectoral approach was used to expose the anterior shoulder structures. The subscapularis tendon was dissected from the capsule, elevated from its attachment on the lesser tuberosity, and retracted medially. The capsule was incised along the equator in a T-shaped fashion to within 5 mm of the glenoid and tagged.

The geometry of the Hill-Sachs lesion (impaction fracture) was appreciated by direct palpation of the defect in the posterolateral aspect of the humeral head. By applying gentle inferior traction and slightly externally rotating the arm, an index finger was passed posterior superiorly and the impaction fracture palpated. Additionally, with the arm placed in extreme external rotation, the impaction fracture can be visualized. Using both palpation and direct visualization, the center of the defect was determined. The tip of an anterior cruciate ligament (ACL) tibial guide (Acufex, Mansfield, MA) was centered in the head defect (Fig 1). The guide was set to fit the curvature of the head appropriately (usually, 55° to 60°). The drill sleeve was approximated to the anterior lesser tuberosity starting hole, which was located 1.5 cm lateral to the articular surface in line with the equatorial capsular split (Fig 2). This starting point was remote from the anterolateral ascending branch of the anterior circumflex artery and thus relatively safe from injury to vascular structures.[8]

Once the guide was set and manually secured, a graduated guidewire was advanced to within a few millimeters of the posterior subchondral surface. After confirmation of satisfactory positioning, an 8-mm cannulated acorn drill was placed over the guidewire and drilled to within 1 cm of the posterior surface. The wire and acorn drill bit were then removed.

The surgeon's index finger was placed posteriorly into the Hill-Sachs impaction fracture recess. Bone tamps were used to elevate the impacted fracture via the tunnel created within the humeral head. A combination of round and "footed" bone tamps was employed. In addition, large curved curettes were used in some cases to palpate the subchondral area and assist in fracture elevation. During elevation of the Hill-Sachs fracture, allograft cancellous bone chips were

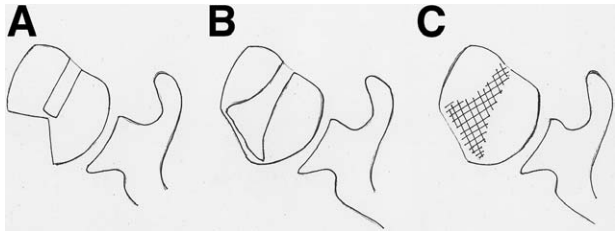

FIGURE 3. Transhumeral disimpaction with allograft reconstruction. (A) An 8-mm cannulated acorn drill is used to create a cavity for insertion of other instruments. (B) The lesion is disimpacted using a tamp to elevate the subchondral bone. (C) The defect created is packed with cancellous allograft bone chips.