Technical Note

Direct Arthroscopy of the Bicipital Groove: A New Approach to Evaluation and Treatment of Bicipital Groove and Biceps Tendon Pathology

Deepak N. Bhatia, M.S.(Orth), D.N.B.(Orth), Karin S. van Rooyen, M.B.Ch.B., and Joe F. de Beer, M.Med.(Orthop)

Abstract: Assessment of the intra-articular and intertubercular regions of the long tendon of the biceps forms an important aspect of routine glenohumeral arthroscopic examination. We describe a new technique of direct visualization of the bicipital groove and tendon by positioning the arthroscope in linear alignment with the bicipital groove. A 4.5-mm cannula is introduced through a superior-medial (Neviaser) portal, into the glenohumeral joint, parallel and adjacent to the superior aspect of the biceps tendon, and is used as a viewing portal. The arm is then positioned in abduction, external rotation, and forward flexion, to align the groove with the arthroscope, thereby attempting to "look down the groove." The biceps tendon, as well as the structures forming its medial and lateral pulleys, can be evaluated from the glenohumeral and intertubercular aspects. A greater length of the medial and lateral lips and the floor and roof of the bicipital groove can be visualized by advancing the arthroscope deeper within the groove. A fat pad along the lateral wall of the groove serves as an anatomic landmark to limit dissection in this region, thereby preventing damage to the anterolateral ascending branch of the anterior circumflex artery. An extension of this technique, to facilitate instrumentation for arthroscopic biceps tenodesis, is described. **Key Words:** Bicipital groove—Biceps tendon—Shoulder arthroscopy—Arthroscopic anatomy—Superior-medial portal—Rotator interval.

Bicipital groove and tendon pathology is a common cause of shoulder pain and dysfunction. Pathologic changes in the humeral bicipital groove or in the long head of the biceps tendon itself can result in bicipital tendinitis.[1-3] Arthroscopic techniques have been described to facilitate intraoperative evaluation of the intra-articular and intertubercular regions of the biceps tendon. These techniques involve visualization through a posterior portal, use of a 70° arthroscope with forward flexion of the arm, and traction on the extra-articular part of the tendon.[4-6] We describe a new technique that involves direct arthroscopy of the bicipital groove, thereby permitting visualization of the bony and soft-tissue boundaries of the bicipital groove, evaluation of the intertubercular region of the biceps tendon, and evaluation of the structures of the rotator interval. Instrumentation through this new approach, for arthroscopic tenodesis of the biceps tendon, is described.

From the Cape Shoulder Institute, Cape Town, South Africa.
The authors report no conflict of interest.
Address correspondence and reprint requests to Deepak N. Bhatia, M.S.(Orth), D.N.B.(Orth), Cape Shoulder Institute, Suite 4, Medgroup Anlin House, 43 Bloulelie Crescent, Plattekloof, PO Box 15741, Panorama 7506, Cape Town, South Africa. E-mail: thebonesmith@gmail.com

Cite this article as: Bhatia DN, van Rooyen KS, de Beer JF. Direct arthroscopy of the bicipital groove: A new approach to evaluation and treatment of bicipital groove and biceps tendon pathology. Arthroscopy 2008;24:368.e1-368.e6 [doi:10.1016/j.arthro.2007.06.009].
0749-8063/08/2403-7269$34.00/0
doi:10.1016/j.arthro.2007.06.009

SURGICAL TECHNIQUE

The patient is placed in the beach-chair position with the back tilted 40° to 60° to the horizontal. The bony outlines of the clavicle, acromion, spine of the scapula, and coracoid are drawn with a surgical skin marker, and portals are marked. A standard posterior portal is used to perform a routine glenohumeral and bursal arthroscopy, via a 4-mm arthroscope with a 30° angled lens.

For direct visualization of the bicipital groove, a superior-medial transmuscular (Neviaser) portal is used; the entry point of the spinal needle is 1 to 2 cm medial to the angle made by the scapular spine and acromion with the distal clavicle, and the exit point is within the glenohumeral joint.[7] The exact position of this portal is judged with a spinal needle; the needle must pass parallel and adjacent to the superior aspect of the biceps tendon as visualized from the posterior portal (Fig 1A). A 4.5-mm cannula is introduced through this portal, along the direction of the spinal needle, into the glenohumeral joint. Next, the arm is positioned in about 70° of abduction (scapular plane) and external rotation and variable forward flexion. The cannula is advanced under the long head of the biceps tendon and into the bicipital groove as far as possible, while viewing from the posterior portal (Figs 1B and 2). The arthroscope is introduced through this cannula, above the biceps tendon, and the bicipital groove is visualized (Fig 3A). The arm may then be repositioned by altering the flexion, abduction, and rotation; this maneuver aligns the bicipital groove with the cannula and also reduces the distance between the groove and the portal, thereby facilitating access and visualization along the groove.

The superior surface of the biceps tendon is visualized from its attachment on the glenoid to as far possible into the groove. The structures forming the medial pulley of the biceps tendon (superior glenohumeral ligament and coracohumeral ligament) are visualized at their humeral attachment and from within the groove (Fig 3A). The cannula and arthroscope are advanced along the superior surface of the biceps tendon, deeper into the groove, and the medial aspect of the biceps pulley and structures forming the roof of the tendon-groove complex are evaluated (Fig 3B). An arthroscope with a 70° lens may be used if deeper visualization is difficult with the 30° lens. The medial and lateral lips of the groove and the undersurface of the biceps tendon are evaluated by manipulating the arthroscope to the inferior aspect of the tendon and corresponding rotation and by lifting the tendon anterosuperiorly with an arthroscopic grasper introduced from a standard anterior portal (Fig 3C). A fat pad may be visualized along the lateral aspect of the bicipital groove; the anterolateral ascending branch of the anterior circumflex artery lies deep to this fat pad,

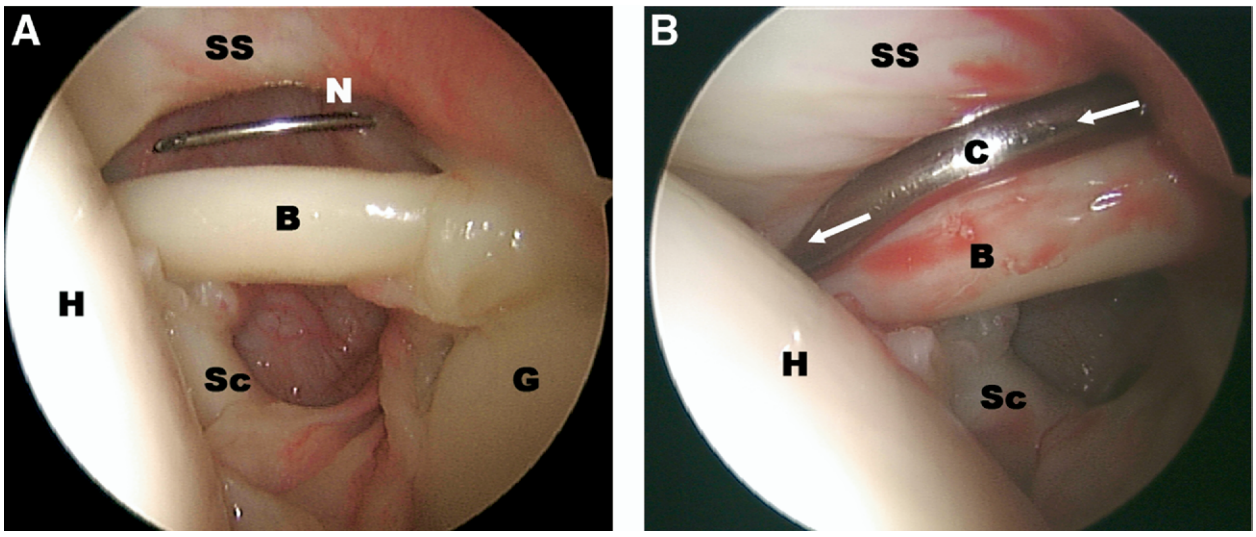

FIGURE 1. (A) Arthroscopic view (30° lens) of glenohumeral joint visualized through posterior portal. A spinal needle (N) is used to judge the exact position of the new viewing portal. The needle enters the joint superior to the biceps tendon anchor (B) and passes parallel to the tendon. (H, humeral head; G, glenoid; SS, supraspinatus; Sc, subscapularis.) (B) Arthroscopic view (30° lens) of glenohumeral joint visualized through posterior portal. A cannula (C) is positioned along the needle tract (arrows) and advanced into the bicipital groove, superior to the biceps tendon (B). (H, humeral head; SS, supraspinatus; Sc, subscapularis.)