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Appendix

Our technique for total shoulder arthroplasty is shown in this YouTube video: <https://www.youtube.com/playlist?list=PLDFvgMV6vaVbZBAuytmnTuz1eiLgNLxfv>.

The total shoulder arthroplasties were performed under general anesthesia without an interscalene block. A deltopectoral approach with a subscapularis peel was used in all patients. To preserve its role in stabilizing the glenohumeral joint, the long head biceps tendon was preserved unless it was frayed or unstable. If a tenodesis was required, the tendon was stabilized by bringing it through a hole in the bicipital groove and out the humeral head cut. The tendon was secured when the humeral implant was inserted. If there were loose bodies in the biceps sheath, these were removed by opening the sheath. After any residual cartilage had been removed with a curette, a hole was drilled in the center of the glenoid face, and the short nub on the reamer was inserted into the hole as described by Service et al.⁴² The reamer was oriented so that reaming yielded a smooth concave surface with a 60 mm diameter of curvature (to match the back of the glenoid component) with the removal of the smallest possible amount of bone without a specific attempt to normalize glenoid version. For B2 glenoids the crest between the paleoglenoid⁴⁸ and the neoglenoid was removed with a bur; the glenoid reamer was then oriented equidistant from the anterior and posterior edges of the glenoid. In cases where there was a large amount of glenoid retroversion, access for reaming was accomplished by complete resection of osteophytes, careful retraction of the proximal humerus, and positioning of the arm. The all-polyethylene glenoid component used in each case had three peripheral cemented pegs and a central fluted peg inserted with cancellous autograft without cement.⁴⁹ The component size was selected so that the available glenoid bone was covered. Holes for the central and peripheral pegs were drilled; the holes for the peripheral pegs were sequentially pressurized with cement after drying them with a sterile CO₂ spray (Carbojet, Kinamed, 820 Flynn Road, Camarillo, CA). A standard length smooth stemmed humeral component (Global Advantage, DePuy, Johnson & Johnson) was inserted in 30 degrees of retroversion with impaction autografting.⁵⁰ We have not found it necessary to alter humeral version or the neck-shaft angle. Centering of the humeral head on the glenoid was achieved by selective anterior soft tissue releases and tensioning of the posterior capsule by the selection of the humeral head component thickness. The degree of release depends on the tightness of the anterior and inferior capsule. The tension in the posterior capsule is properly tensioned by selecting a humeral head component that allows 50% posterior translation and internal rotation of the abducted arm to 60 degrees. Ten (12%) of the shoulders with B2 glenoids and 6 (12%) of the shoulders with B3 glenoids patients had anteriorly eccentric humeral head components used to manage excessive posterior translation identified intraoperatively. The effectiveness of an anteriorly eccentric humeral head prosthesis in managing

excessive posterior decentering has been published.³⁷ No shoulder required a posterior capsulorrhaphy. The subscapularis peel was repaired to the lesser tuberosity with six #2 non-absorbable braided polyester sutures. In four patients excessive posterior translation remained after insertion of the components. In these cases a rotator interval plication was performed using four #2 non-absorbable sutures passed through the subscapularis and supraspinatus tendons. All patients started passive range of motion exercises on the day of surgery and began gentle strengthening exercises with the two-hand press at 6 weeks after surgery.

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