Technical Note

Arthroscopic Grafting of Greater Tuberosity Cyst and Rotator Cuff Repair

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Abstract: Cysts of the greater tuberosity can be a normal finding independent of age and concurrent rotator cuff tear. The presence of a large greater tuberosity cyst can present a challenge at the time of rotator cuff repair. We present a 1-step arthroscopic technique to address these defects at the time of rotator cuff repair using a synthetic graft (OsteoBiologics, San Antonio, TX) originally designed to address osteoarticular defects. With the viewing portal established laterally, a portal allowing perpendicular access to the cyst is established. The cyst is thoroughly debrided, and a drill sleeve is then introduced perpendicular to the surrounding bone, serving as a guide for the matching drill to create a circular socket. A correspondingly sized TruFit BGS cylindrical implant (OsteoBiologics) is then implanted by use of the included instrumentation. The scaffold is placed flush with the surrounding bone. Because our arthroscopic rotator cuff protocol uses a tension-band technique with placement of suture anchors distal and lateral to the rotator cuff footprint, we are subsequently able to proceed with routine rotator cuff repair. **Key Words:** Rotator cuff repair—Bone graft—Surgical technique—Humeral cyst.

It is unclear whether cysts within the vicinity of the rotator cuff insertion on the greater tuberosity are developmental, are correlated with age-related changes, or are specific to rotator cuff pathology.[1-4] A radiographic study of patients with symptomatic and surgically documented rotator cuff tears has shown a positive correlation with greater tuberosity cysts.[5] Experimental work has also cited bone loss as a possible factor in poor healing of rotator cuff repairs.[6]

The presence of cysts can present a dilemma at the time of rotator cuff repair. We present a 1-step arthroscopic technique to address these defects at the time of rotator cuff repair using porous, resorbable scaffolds composed of polylactide–co-glycolide copolymer, providing structure and calcium sulfate and promoting bone ingrowth (TruFit BGS Plug; OsteoBiologics, San Antonio, TX).

TECHNIQUE AND CASE REPORT

A 57-year-old woman slipped and fell onto her outstretched dominant arm, injuring her shoulder. Because pain and weakness persisted despite conservative management, she was referred to our shoulder clinic. A thorough radiographic and clinical examination revealed the presence of both a rotator cuff tear and a significant greater tuberosity subcortical cyst (Fig 1A). After a thorough review of the risks, benefits, and options regarding treatment, along with our recommendations, the patient was eager to proceed with arthroscopic treatment. We routinely use a semi–lateral decubitus position for arthroscopic shoulder

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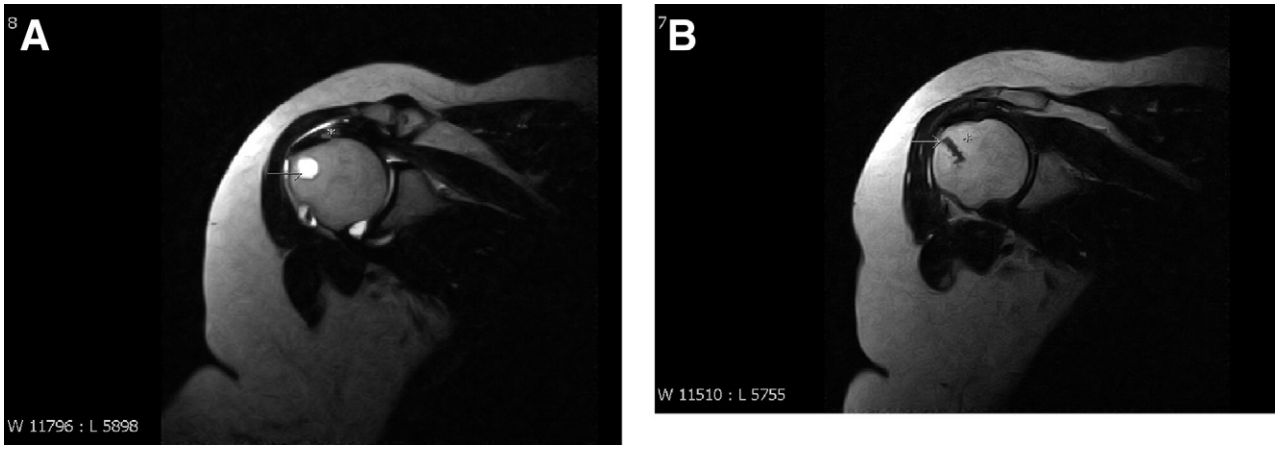

Figure 1. (A) Preoperative magnetic resonance scan, showing greater tuberosity cyst (arrow) and rotator cuff tear (asterisk). (B) Magnetic resonance scan at 6 months after surgery, showing healed tuberosity cyst (asterisk) and rotator cuff, as well as placement of anchors distal and lateral to rotator cuff footprint (arrow).

procedures. For arthroscopic rotator cuff repair, the viewing portal is placed laterally, allowing working portals to be placed circumferentially and providing an orthogonal view of the tuberosity and rotator cuff tear. After thorough bursectomy and debridement of devitalized tissue were performed, allowing a clear view of the size and pattern of the patient's rotator cuff tear, the humeral cyst was localized and probed. A portal adjacent to the lateral border of the acromion allowing perpendicular access to the cyst via spinal needle localization was established. The cyst was thoroughly debrided to bleeding bone with an arthroscopic shaver. A drill sleeve, matching the size of the defect, was then inserted perpendicular to the surrounding greater tuberosity, serving as a guide for the matching drill to create a circular socket. A correspondingly sized TruFit BGS cylindrical implant (OsteoBiologics) was then implanted by use of the included instrumentation. The scaffold was placed flush with the surrounding bone (Fig 2A). Because our arthroscopic rotator cuff repair protocol uses a tension-band technique with placement of suture anchors distal and lateral to the rotator cuff footprint, we were able to proceed with routine rotator cuff repair (Fig 2B).

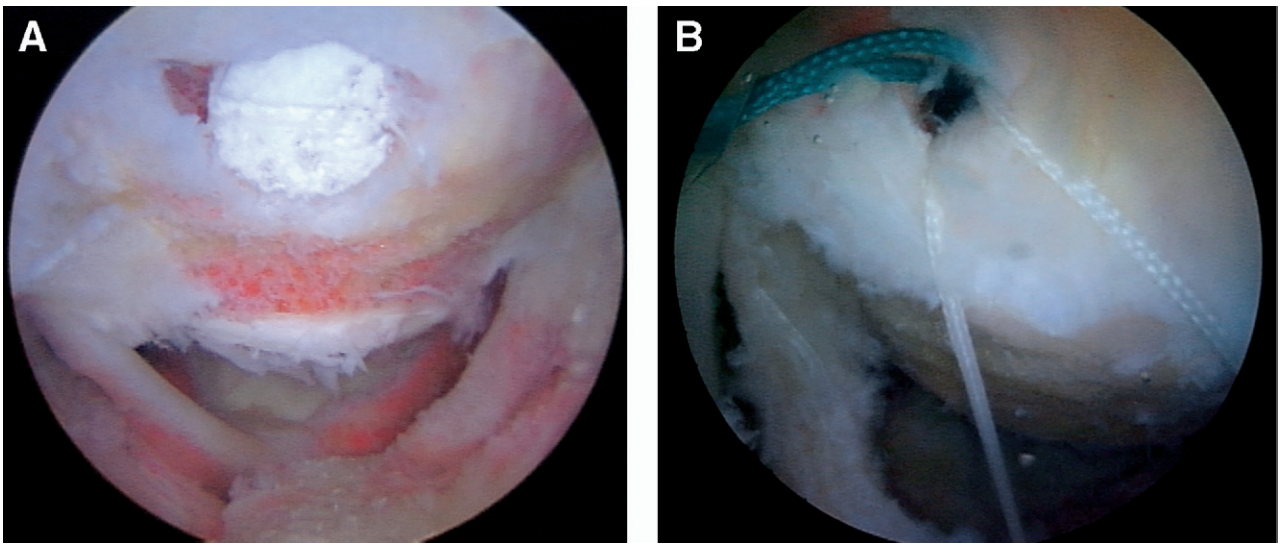

Figure 2. (A) Prepared and grafted defect at greater tuberosity. (B) Placement of anchors distal and lateral to rotator cuff footprint.

Postoperatively, the patient was started on our standard arthroscopic rotator cuff repair protocol. Magnetic resonance imaging performed 6 months postoperatively confirmed healing of both the greater tuberosity cyst and the rotator cuff (Fig 1B).

DISCUSSION

The role that humeral cysts play in rotator cuff tears has not been completely elucidated. Whereas humeral cysts can exist independently of age or rotator cuff tear, their presence has also been linked with increased greater tuberosity porosity and rotator cuff disease.[5,7,8] In addition, reduced bone density has been cited as a contributing factor for both reduced biologic healing and increased mechanical failure after rotator cuff repair.[6,9]

Whereas the ideal graft serves osteogenic, osteoinductive, and osteoconductive roles, graft site harvest morbidity has been a limiting factor in the utilization of autograft.[10,11] With synthetic grafts containing the copolymers polylactic acid and polyglycolic acid with calcium sulfate, it has been shown that as these materials degrade, they can act as a scaffold, allowing for bony ingrowth.[12] Given that the contribution and presence of humeral cysts in rotator cuff pathology are not entirely clear, any decision to perform treatment has to be weighed carefully against the morbidity and risks involved. Ideally, an arthroscopic approach with minimal additional risk beyond the already planned procedure may prove beneficial. Although arthroscopic approaches utilizing autograft and allograft have been described previously, both autograft and allograft have associated morbidity and risks that must be weighed accordingly.[10,11,13-16]

CONCLUSIONS

Using a readily available artificial scaffold, avoiding the possibility of both graft harvest morbidity and infectious disease transmission, to address a humeral cyst arthroscopically at the time of rotator cuff repair, to our knowledge, has not been previously reported. Because these scaffolds are not intended to serve a structural role, their utility in our practice is limited to well-circumscribed defects amenable to the creation of a tubular socket (e.g., humeral cyst, defect in the tuberosity after removal of an anchor or hardware, as well as a humeral osteochondral defect). Situations requiring the bone graft to provide immediate structural support, in our practice, are better handled with other options. We suggest this technique as a readily available option with minimal additional time and morbidity for the arthroscopic surgeon to consider when faced with a similar clinical dilemma.

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