

Case Report

Biological Resurfacing for Osteoarthritis of Shoulder- A Novel Method

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Introduction

Shoulder osteoarthritis in elderly is increasingly being treated with total shoulder arthroplasty/ hemiarthroplasty which provides excellent functional outcome and improved implant survivorship [1]. The treatment is challenging in relatively younger patients with degenerative shoulder conditions. This patient population has higher functional demands and expectations. Moreover longer implant survivorship is warranted due to their increased life expectancy [2]. As a result, these patients require a biological and bone conserving surgery.

Case Report

Our patient is 59 years old Caucasian male who complained of increasing pain and discomfort in right shoulder which aggravated with movements of the joint. He is a construction worker who lifts heavy weights and wanted to partially continue his work after surgery. He had no medical co-morbidities. On examination, he had decreased active and passive range of movements with palpable crepitus. Rotator cuff power was normal. Standard radiographs showed all the features of osteoarthritis including reduction in joint space, subchondral sclerosis and inferior humeral head and glenoid osteophytes. MRI showed cartilage loss in both humeral head and glenoid, and that the rotator cuff was intact.

In beach chair position, Mckenzie's approach was utilized to expose the shoulder joint. Sub acromian bursa was excised and acromioplasty was completed. Subscapularis tendon and capsule was divided and humeral head exposed with external rotation. Osteophylectomy and sizing of humeral head was done. Preparation and trialing of humeral head was completed. Microfracture of glenoid was done, followed by application of a mixture of stem cell concentrate and fibrin glue over the prepared glenoid surface. Uncemented metal prosthesis was then inserted over the prepared humeral head and reduction was obtained and checked for joint stability and tension.

Discussion

Shoulder arthritis is an increasing problem in the aging population. Shoulder abuse especially heavy weight lifting is a risk factor [3] for early wear as seen in our patient.

Although physical therapy and medications are the early modes of treatment, more advanced disease unresponsive to conservative treatment is managed surgically such as arthroscopic debridement, hemiarthroplasty, total shoulder replacement and more recently shoulder resurfacing [4,5,6]. Although total shoulder arthroplasty is the gold standard treatment in management of osteoarthritis,

concerns of early glenoid component loosening exist especially in younger patients [7,8]. Even though the survivorship of hemiarthroplasty with stemmed implants was 97% at 5 years follow up in one series [8], around 47% of patients had unsatisfactory results. Hemiarthroplasty with glenoid reaming is an option in older patients [9,10] with increased short term revision rates in younger cohort [9].

Shoulder resurfacing is emerging as a preferable alternative in patients less than 60 years [2]. Advantages of humeral head resurfacing include minimal bone resection, a short operative time, low prevalence of humeral periprosthetic fractures, maintenance of native inclination, offset, head-shaft angle and version of the humerus [11], and an ease of revision to a conventional total shoulder replacement, if needed and ability to implant in deformed shaft. Outcomes of various surface replacement arthroplasty designs have been comparable with those of arthroplasties with a stemmed prosthesis in numerous short and mid-term follow-up studies [12,13].

Biological resurfacing of glenoid with anterior capsule autograft, fascia lata autograft, lateral meniscal allograft, and Achilles tendon allograft has been advocated in young patients with good results by some authors [14]. These results have not been reproduced in other series and they documented 44-77% failure rates [15,16,17,18]. Significant foreign body reaction with this procedure has been reported in one series [19].

Micro fracture technique has been used by many authors in various joints either through open or arthroscopic means for full thickness cartilage loss [20]. This resulted in formation of combination of fibro cartilage with hyaline like cartilage resulting in good patient outcomes [21]. This technique was used in shoulder joint in our patient.

Our patient was treated with cementless humeral resurfacing of

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humeral head with micro fracture of glenoid socket. Then stem cell concentrate was mixed with glue of clotting factors and was applied over the micro fractured glenoid surface. This technique of biological resurfacing is unique and is not described in any of the previous reports.

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