



Original Article

Getting back in the game after humeral head resurfacing

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ABSTRACT

Background: Aim of this investigation was to analyze whether patients undergoing humeral head resurfacing (HHR) surgery are able to successfully return to their sports and occupation afterwards.

Materials and methods: Fifty patients treated with CUP (HHR) arthroplasty were included. Two groups were built: Patients who have participated in sports less than 5 years prior surgery (Group 1: n = 42 (84%)) and patients who have never participated in sports (Group 2: n = 8 (16%)). Evaluation was based on a questionnaire asking for types of sports, frequency, time to return to sports and work as well as limitations in work life.

Results: Mean age at the time of surgery was 58.6 (36–84) years in Group 1 and 65 (56–75) years in Group 2. Mean time follow-up was 5.5 years (2.5–12) years. Twenty-seven (64%) patients in Group 1 participated in sports right before surgery. Twenty-one patients (50%) returned to sports after surgery. The returning rate was 78%. Seven (17%) patients in Group 1 stated that the reason they underwent shoulder replacement surgery was to continue to participate in sports. Swimming and skiing were two of the most favorable sports. Two (4%) patients had to change their profession due to surgery. Most of the patients were retired at follow-up.

Conclusion: Most of the active patients undergoing HHR surgery are successfully able to return to their sports activities after surgery. Patients employed were able to return to their occupation after surgery. Many patients were already retired at the time of follow up.

1. Introduction

Shoulder arthroplasty has evolved over recent decades into a reliable procedure with satisfactory long-term outcome.^{1,2} Advances in implant design and techniques have led to good implant survival.

The balance between implant stability and survival on one hand and bone preservation and less invasive procedures on the other remain a major challenge for surgeons. New implant designs have helped to address these concerns.

The first humeral head resurfacing system was inaugurated in Sweden in the 1980s. It was used mainly in young patients with rheumatoid arthritis, preserving most of the proximal humeral bone stock.³ The breakthrough for the cup prosthesis came with Copeland's work in the 1990s in the UK. Both primary arthritis of the shoulder and rheumatoid arthritis were treated, preserving bone for possible revision surgery, especially in younger patients. Zimmer's Durom cup brought the technique to Germany, treating mainly younger patients suffering from primary arthritis, rheumatoid arthritis, or humeral head necrosis. Good medium- and long-term results were reported.^{4,5} The principal

disadvantages of humeral head resurfacing are the difficult exposure of the glenoid and the neurological complications reported after glenoid replacement.

However, humeral head resurfacing can be an attractive treatment option in young patients with rheumatoid arthritis or primary arthritis, especially when the glenoid is still intact, yielding more options in the event of revision surgery. Young patients are particularly likely to ask whether they will be able to participate in the same activities as before surgery and what kinds of sports they will be able to play after the operation. Studies on this topic are rare.

The aim of this investigation was therefore to ascertain to what extent patients who had undergone humeral head resurfacing surgery successfully returned to their sports activities and working life thereafter.

2. Materials and methods

Seventy humeral head resurfacing operations in 70 patients performed at a single shoulder center between 2003 and 2011 were

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included in this retrospective study. All patient records were reviewed. All of the operations were performed by the same senior surgeon or under his supervision.

The inclusion criteria for this investigation were: (1) patients humeral head resurfacing without replacement of the glenoid and (2) minimum follow-up of 2 years. Various diagnoses leading to hemi shoulder replacement surgery were included. Patients were treated with either the Copeland resurfacing system (Biomet[®], Indiana, USA) or the Epoca resurfacing system (Synthes[®], Pennsylvania, USA).

A questionnaire was developed and sent to all patients who had undergone hemi shoulder arthroplasty surgery (see Appendix A). Information was sought on sports activities, frequency of participation in sports, time to return to the same level of activity as before shoulder replacement surgery, level of sports, time to get back to work, and limitations in work or sports due to shoulder replacement surgery.

The study was reviewed and accepted by the ethic committee. The IRB Approval number is S-305/2007.

2.1. Surgical procedure

For surgery the patient was placed in the beach chair position. A delto-pectoral approach was used in all cases. After exposure of the proximal humerus with its anatomic neck, the humeral head was prepared for resurfacing. In the presence of good cancellous bone a cup arthroplasty was implanted. Next, the glenoid was exposed. Humeral head resurfacing was performed only in patients with A1 or A2 glenoid morphology according to Walch.⁶ Final reduction and closure of the wound followed after insertion of a drain. An abductor splint was put on in the operating room (Figs. 1 and 2).

3. Results

3.1. Demographic findings

Of the 70 patients that met the inclusion criteria, 50 (71%) could be recruited. The remaining 20 patients had either died (13; 19%), could not be contacted after moving to a new address (4; 6%), or declined to participate in the study (3; 4%). All 50 patients recruited completed the questionnaire in full.

The mean duration of follow-up was 5.5 (2.5–12) years.

The collective was divided into two groups: patients that had participated in sports activities no more than 5 years prior to shoulder replacement surgery (group 1: 42, 84%) and patients that had participated in sports activities (group 2: 8, 16%).

The Patients' overall mean age at the time of shoulder replacement surgery was 59.7 (36–84) years. The mean age in group 1 was 58.6



Fig. 2. The x-ray 12 years after surgery.

years (36–84) and in group 2 65 years (56–75). There was no significant difference between the two groups in this respect ($p = .1632$).

The collective consisted of 32 women (64%) and 18 men (36%), Group 1 comprised 26 women (62%) and 16 men (38%).

The diagnoses leading to cup hemi arthroplasty were posttraumatic osteoarthritis ($n = 14$; 28%), primary osteoarthritis ($n = 31$; 62%) and humeral head necrosis ($n = 5$; 10%). None of the patients had undergone previous surgery on the affected shoulder.

Eighteen (36%) left shoulders and 32 (64%) right shoulders were treated. In group 1 the left shoulder was treated in 15 patients (36%) and the right shoulder in 27 patients (64%). In 31 cases (62%) the dominant side was affected, in 19 cases (38%) the non-dominant side. In group 1 the dominant arm was affected in 26 patients (62%) and the non-dominant arm in 16 patients (38%).

3.2. Intraoperative complications

There was 1 (2%) intraoperative complication, namely a humeral stem fissure. It needed no further treatment and was followed up clinically and radiographically.

3.3. Postoperative complications

There were three superficial wound infections after operation. All of them were successfully treated with oral antibiotics and were followed up clinically. No further treatment was necessary.

3.4. Sports activities

Twenty-seven (64%) of the 42 patients in group 1 took part in their sports activities up to the time of surgery. Of the 15 patients (36%) that were no longer participating in sports at the time of surgery, eight



Fig. 1. The preoperative x-ray.

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