



Excision arthroplasty following shoulder replacement

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Excision arthroplasty of the shoulder is a rarely performed procedure used in cases where replacement of a failed arthroplasty is not feasible. We report four cases of excision arthroplasty following a shoulder replacement, one performed for infection and three for instability. Excision arthroplasty resulted in very poor function with pain improvement in only two cases.

Keywords: shoulder ; arthroplasty ; excision arthroplasty.

INTRODUCTION

Excision arthroplasty is performed in cases where a joint replacement can not be salvaged and where arthrodesis is contra-indicated or may be difficult to achieve. Excision arthroplasty has been reported in the knee, hip and elbow joint with mixed results (2,4,5,7,8,10). In those joints it has provided pain relief but resulted in instability and poor function. Although excision of the shoulder girdle for malignant tumours has been reported (7), to our best knowledge there have been no reports of excision arthroplasty following shoulder replacement, hence this study.

PATIENTS AND METHODS

The database of a tertiary referral centre in the UK was reviewed to identify patients who had excision arthroplasty following shoulder replacement, between May 2001 and July 2008. Four patients were identified,

two of which had died. Two patients that had excision arthroplasty were reviewed for this study by clinical examination, as well as by using medical and radiological records. Pain was recorded on a visual numerical score (VNS) (0-10, 0 = no pain, 10 = maximum pain). Constant-Murley (1), the Association of Shoulder and Elbow Surgeons (ASES) (9) and Oxford shoulder scores (3) were used to assess function. The medical records were reviewed for the two dead patients to determine pain and range of motion.

RESULTS

The details of the four cases with excision arthroplasty are presented below.

Case 1

A 70-year-old female underwent a hemi-arthroplasty (Global FX, DePuy, UK) of her non-

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Fig. 1. — Anteroposterior and lateral radiographs of case 1 post excision arthroplasty.

dominant shoulder for an un-united proximal humeral fracture. She subsequently developed anterior instability due to sub-scapularis deficiency and was revised to a reverse prosthesis (DELTA, DePuy, UK) one year following primary surgery. At revision sub-scapularis and the superior cuff were absent. Post revision surgery she continued with severe disabling global shoulder pain which was worse than prior to revision surgery. An ultra-sound scan suggested a fluid collection and the inflammatory markers were elevated. Aspiration of the shoulder replacement produced turbid straw coloured fluid but no microbiological growth. A year following revision surgery she was commenced on empirical oral antibiotic treatment. Sixteen months post revision, plain radiographs suggested that the glenoid component had displaced. She underwent excision arthroplasty and debridement of the shoulder 4 years following primary surgery. At operation a large amount of pus was found in the glenohumeral joint and both the glenoid and humeral components were loose. Following surgery she was



Fig. 2. — Anteroposterior and lateral radiographs of case 2 post excision arthroplasty.

allowed to mobilise and had physiotherapy aiming at deltoid and peri-scapular muscle strengthening. The patient was reviewed for this study at 7 months post excision arthroplasty (Fig. 1). At this time there was no clinical evidence of infection, CRP was < 10 mg/L and ESR 44 mm/Hr. She reported that the only function feasible with the affected arm was holding a low weight bag.

Case 2

A 73-year-old female had a total replacement (Global total shoulder, DePuy, UK) for osteoarthritis of her dominant shoulder. Post-operatively she developed anterior instability after a fall, and 3 months following the initial procedure she had revision of the humeral component to one in a more retroverted position (60° retroversion). The glenoid was found to be at 30° anteversion. She continued to complain of anterior instability and had a further revision whereby the humeral component was placed in 80° retroversion and a posterior offset



Fig. 3. — Photographs demonstrating range of motion possible following excision arthroplasty in case 2 (a : forward flexion ; b : abduction ; c : external rotation).

head inserted. The patient continued to demonstrate signs of instability as well as deficiency of the superior rotator cuff. She therefore underwent excision arthroplasty 8 years following the primary procedure. At surgery the anterior sub-luxation was confirmed and the glenoid component was noted to be loose. The glenoid bone stock was considered sufficient for a reverse prosthesis. The patient was reviewed for this study at 39 months post excision arthroplasty (Figs. 2 & 3).

Case 3

An 83-year-old female had a shoulder hemiarthroplasty (Global, DePuy) of her dominant arm for rotator cuff arthropathy. She developed an anterior dislocation of her replacement following an

injury and subsequently underwent further surgery. At revision, 2 months following initial surgery, the humeral component was placed in a more retroverted position and the anterior glenoid was bone grafted. She continued with persistent pain due to anterior instability and had an excision arthroplasty 11 months following primary surgery. The pain improved following excision arthroplasty but movements were restricted.

Case 4

A 79-year-old female had a shoulder hemiarthroplasty (Global, DePuy) for rheumatoid arthritis. At primary surgery the superior rotator cuff and subscapularis were absent. A reverse prosthesis was not feasible due to an intra-operative glenoid fracture. Post-operatively she continued with severe disabling pain. She also developed superior instability and subluxation of the prosthesis which resulted in acromial erosion and fracture. There was no evidence of infection clinically and the inflammatory

Table I. — Subjective assessment of the two cases post excision arthroplasty of the shoulder

	Case 1	Case 2
<i>Activities of daily living</i>		
Put on a coat	very difficult	can not do
Sleep on affected side	can not do	can not do
Wash back/do up bra at back	can not do	can not do
Manage toileting	can not do	can not do
Comb hair	can not do	can not do
Reach a high shelf	can not do	can not do
Lift 10lbs above the shoulder	can not do	can not do
Throw a ball overhand	can not do	can not do
Do usual work	can not do	can not do
Do usual sports	can not do	can not do
VNS pain at rest	0/10	10/10
VNS pain at night	0/10	10/10
VNS pain in general	2/10	10/10
Shoulder stability	constantly unstable	constantly unstable
Result of excision arthroplasty	unsatisfactory	poor
Current vs. prior to excision	worse	worse

Table II. — Objective assessment of two cases post excision arthroplasty of the shoulder

	Case 1	Case 2
Forward elevation	30°	40°
Abduction	20°	45°
External rotation	0°	0°
Internal rotation	thigh	thigh
Extension	10°	0°
Constant-Murley score	23	6
ASES score	51.7	0
Oxford score	35	59

markers were normal. She underwent excision arthroplasty 18 months post primary surgery. Post excision arthroplasty she continued with severe pain not helped by multiple suprascapular nerve blocks and opioid analgesia. The patient was reviewed at 6 months following excision arthroplasty. Movements were 45° of forward elevation, and abduction and internal rotation to the level of the buttock.

The subjective and objective assessments of cases 1 and 2, that were alive at the time of this study, are presented in tables I and II.

DISCUSSION

Excision arthroplasty of the shoulder is considered a last resort when attempts to preserve a native

or artificial joint have failed. Excision arthroplasty is well described for the hip, knee, and elbow joint (2,4,5,7,8,10). When used for these joints the results have been unpredictable with some patients reporting significant improvement in pain but some continuing with residual pain. In addition joint instability and poor function are a usual occurrence. Secondary reconstruction of the shoulder joint following failure after an arthroplasty is not as easy as in other joints such as the hip or knee due to the loss of the remaining glenoid structure and muscle damage.

In this study we report four cases that had excision arthroplasty of the shoulder following a total shoulder replacement. Two patients reported improvement in pain whereas the other two continued with severe pain. Interestingly there was no

correlation between a diagnosis of infection and improvement in pain. Poor function and range of motion was uniform in all four. Loss of the humeral head would be expected to de-tension and hence dysfunction the deltoid. Such a loss of mechanical advantage would not be expected to improve with physiotherapy and deltoid strengthening exercises. The shoulder is vital in positioning the upper limb in space for the elbow and hand to function, hence a flail shoulder is very disabling.

Our cases suggest that every attempt should be made to avoid an excision arthroplasty in the shoulder. The possible poor results following a failed shoulder arthroplasty should encourage surgeons to consider other forms of treatment before offering an arthroplasty in the first place. A trial of a spacer may be advisable prior to proceeding to complete excision arthroplasty.

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