USE OF FIBULA TO REPLACE PROXIMAL HUMERUS (A Case Report)

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Introduction

One often comes across a lesion of the upper end of the humerus which is either benign or locally malignant of low grade malignancy where sacrificing the limb is not required. There comes the requirement of stabilizing the flail shoulder which results after resection of the upper end of humerus. For this there are several alternatives. We have used fibular autograft as a good substitute with satisfactory results.

CASE REPORT

A 25-year-old female presented with a two month history of painful swelling of the upper end of the humerus with restriction of terminal range of movements at shoulder though the joint was uninvolved. Radiological examination revealed a separate lytic lesion in the upper end of the humerus with expansion of the cortex. There was no neurovascular involvement. It was diagnosed as a benign tumor of the right humerus. Open biopsy confirmed the diagnosis of giant cell tumor. Chest radiogram was normal.

The upper end of the humerus, including the tumor with a free margin, was removed preserving the abductor muscles. The neurovascular bundle was preserved. An appropriate length of upper shaft of the right fibula was removed with separate instruments. After tapering one of the ends of the fibular autograft it was inserted into the humeral shaft. The proximal end of the fibula was placed in the glenoid cavity. The soft tissues were sutured back and the wound was closed. A shoulder spica was applied after the operation.

After 3 months the plaster spica was removed and the shoulder was gradually mobilized. At 6 months, the shoulder could be actively abducted and flexed to 50-60 degrees. The patient could do her routine household work at 9 months. There was no recurrence or graft failure at 2 years follow-up.

Discussion

For aggressive benign lesions and low grade malignancies of the upper end of the humerus, re-

section of the proximal humerus along with wide margins may be adequate. The commonest examples of such lesions are giant cell tumors and low grade chondrosarcomas which are well-localized. Recently, shoulder girdle resections have been classified into 6 types. Out of these, Type 1-A, which denotes intra-articular proximal humeral resection preserving the abductors, is used for benign and low grade tumours of the proximal humerus [1].

After resection of the proximal humerus the shoulder becomes flail and therefore its function is grossly affected. To overcome this problem several reconstructive procedures are described in literature viz. a) passive spacer, b) arthroplasty (implant or allograft), and c) arthrodesis (2). Each procedure has its own advocates.

If sufficient soft tissue remains to provide adequate stability, a passive spacer yields better

Fig. : Radiograph showing Giant cell tumour of upper end of humerus and fibular autograft in situ after its resection.

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cosmetic and functional results and also more stability than a flail shoulder [2]. For this purpose a fibular graft is the cheapest and easiest method besides being safe and effective. However there are certain problems associated with any cortical graft viz. a) fatigue fracture b) limited capacity to hypertrophy in adults, usually no more than 25% [3], c) nonunion and d) pain at donor site. The donor morbidity after fibular graft is less than 5% and usually takes the form of transient peroneal palsy due to nerve retraction. Adults experience no disability provided the lateral malleolus is stable. Allogenic cortical grafts have higher incidence of nonunion, fatigue fracture, and infection than their autogenous counterparts [3].

The stability provided at the shoulder by the fibular graft allows the patient to use the normal elbow and hand as opposed to a flail shoulder which has no stability. If adequate soft tissue is not available for stabilization then this spacer method

should not be used because of their predilection for painful habitual dislocation [3]. Patients undergoing prosthetic replacement have restricted shoulder abduction but the advantage is early rehabilitation as compared to a fibular autograft [1].

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