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Osteotomy of the Margo Medialis Scapulae to Approach Subscapular and Subrhomboid Tumors. A Technical Note

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Abstract

Purpose: The approach to resect subscapular and subrhomboid tumors needs elevation of the scapula. This is usually performed by detaching the muscles from the margo medialis of the scapula. We wish to communicate our technique of a longitudinal osteotomy of the margo medialis for improved refixation of the muscles. **Patients and Methods:** 5 patients with subscapular and one patient with a subrhomboid benign tumor were operated on using this technique. **Results:** All patients achieved stable healing and full functional recovery; only in one patient there was slightly reduced elevation of the arm. **Conclusion:** Elevation of the muscles inserting into the medial scapular margo with a small rim of bone facilitates refixation and allows for excellent restitution of function.

Keywords

Subscapular/Subrhomboid Tumors, Surgical Access, Osteotomy of Margo Medialis Scapulae

1. Introduction

The approach to remove subscapular tumours requires elevation of the scapula usually by detaching the rhomboid muscles from the margo medialis of the scapula [1]-[9]. As these muscles directly insert into the periosteum without tendons, stable refixation is rendered difficult, because sutures easily pull out of the muscle tissue.

We have used a longitudinal osteotomy of the margo medialis of the scapula leaving the muscle insertion on a small rim of bone for secure reattachment to the scapula. We wish to contribute this technique, as it gave excellent functional results.

2. Materials and Methods

2.1. Patients

Five patients with subscapular processes (3 osteochondromas, 1 ossifying lipoma, one fibroma of Gardner type) and 1 with a subrhomboid lipoma had resections using osteotomy of the margo medialis scapulae to either elevate the scapula to access subscapular space or to get underneath the rhomboid muscles. Age range at operation was 18 to 49 years; 5 male, 1 female patient. Surgeries were performed between 2010 and 2018 similarly on the six consecutive patients presenting with comparable pathologic anatomy.

2.2. Surgical Technique

The patients were operated in the lateral decubitus position on the opposite side. The entire arm and shoulder region was prepped and draped to allow free mobility. Skin incision followed a dorsal straigt "sabre" cut over the center of the spina scapulae to the inferior angle (**Figure 1(a)**). The skin is then mobilized to the medial border. Abducting the arm facilitates retraction of the M. trapezius, which if needed can be mobilized by short subperiosteal dissection from the spine of the scapula. The scapular bone is then exposed by electrocautery or shaw scalpel about 8 mm from the medial border of the scapula. Holes are drilled before performing the osteotomy on both sides of the cut for the later refixation at the correct level by non-resorbable sutures. Then the margo medialis is separated by saw osteotomy; it can be elevated to expose the subrhomboid space (**Figure 2(b)**). In the case with the osteochondroma extending anteriorly and posteriorly to the scapula (**Figure 1**) elevation of the infraspinous muscle was needed additionally.

In cases of subrhomboid lesions the muscle is carefully exposed by elevating it with the medial border (**Figure 2**).

As the lesions in these cases have been benign marginal resections were appropriate.

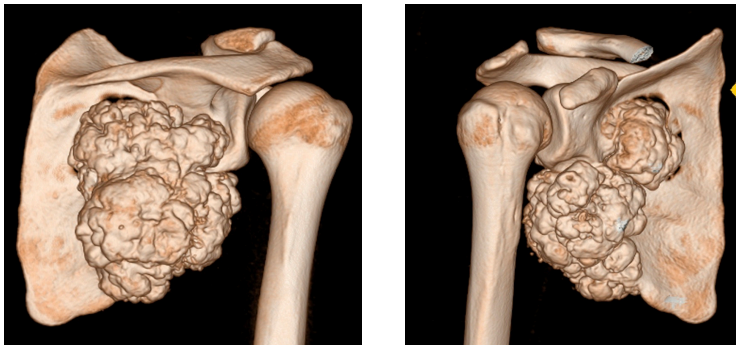
3. Results

Except for the patient in **Figure 1** showing mildly reduced elevation full range of motion without scapular winging was seen in all patients at follow-up 4 years and longer. All operations were performed together with the first author, who also reexaminded the patients.

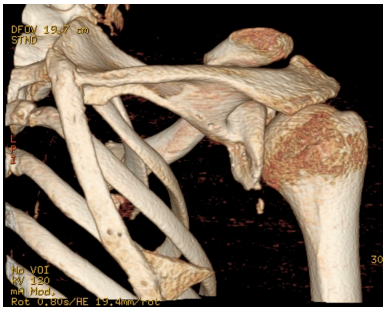
4. Discussion

In this serious of six consecutive cases operated similarly by osteotomy of the

(a) (b)



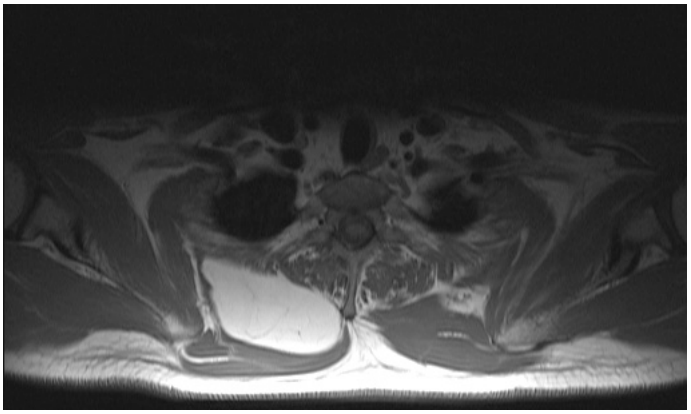
(c) (d)



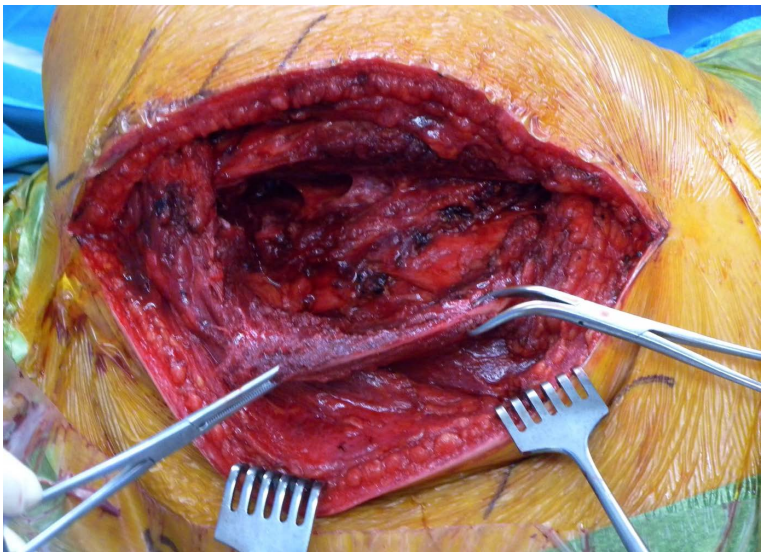
(e)

(f) (g)

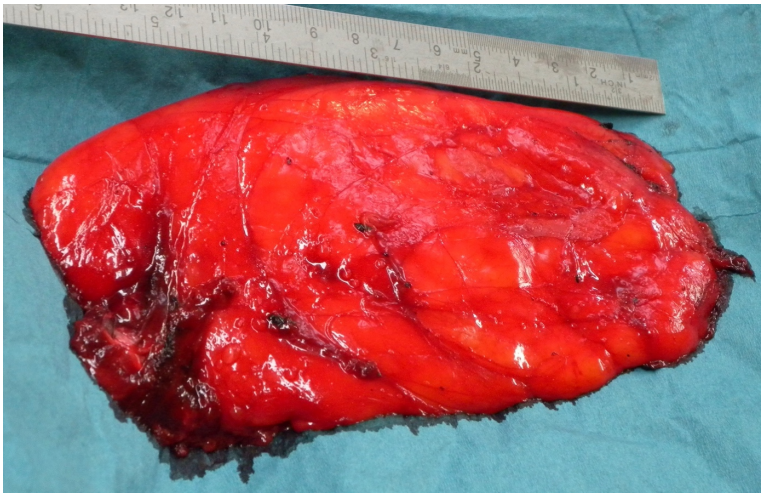
Figure 1. At age 21 years the patient presented an osteochondroma of the scapula. In this case the scapula needed be exposed anteriorly and posteriorly with elevation from the subscapular as well as the infraspinous muscle. The teres major muscle was elevated with part of the inferior angle. CT-images show the extent of the osteochondroma ((b)-(d)) and the situation 2 months after the resection/reconstruction (e). At 5 years postoperative the patient presents with minimally restricted elevation ((f), (g)).



(a)



(b)



(c)

Figure 2. At the age of 49 years the lipomatous tumour (T1-weighted MRI, (a)) with maximal extension of 13 cm was found at evaluation for thoracodorsal discomfort. Under the elevated osteotomized margo medialis of the scapula the lesion is seen (b), which was resected en bloc (c).

medial border of the scapula leaving the rhomboid attachments it appeared that stable refixation could easily be achieved. Functionally results have been excellent.

Drawback of this study is that results cannot be compared regarding functional differences between muscle detachment from the bone and the presented technique. However, the presented technique is easily performed and may result into better stability and function.

5. Conclusion

Muscle reattachment to the scapula has been found reliable when detached with a bony rim of the margo medialis scapulae.

Informed Consent

Informed consent was obtained from all patients.

Conflicts of Interest

There are no conflicts of interest.

Author Contribution

All authors were involved in the surgeries and contributed equally to the evaluation and finalizing the manuscript.

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