Surgical Treatment of Myositis Ossificans Traumatica of the Neck: A Case Report

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Abstract

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the pathophysiology of myositis ossificans traumatica (MOT), its diagnosis, and surgical treatment as applied to a case of unusual localization within the neck.

Objectives: We report on surgical excision for treatment of a unique case of MOT of the neck, located in an accessory muscle arising from the left scalene, that developed secondary to trauma sustained to the left neck and arm in a snowmobile accident.

Study Design: Illustrative case report and literature review.

Introduction

Heterotopic ossification (HO) is the pathologic formation of bone in extraskeletal tissues (1). Myositis ossificans is a benign disorder of HO within muscles and soft tissues (2). It is often classified into three entities: myositis ossificans progressiva (also known as fibrodysplasia ossificans progressiva), a rare autosomal dominant disease of fibrous nodule formation in multiple sites that is often fatal) and myositis ossificans circumspecta (benign, localized, and well-defined HO), which is subclassified as traumatic or atraumatic (3,4). The traumatic form represents 75% of cases and is referred to as myositis ossificans traumatica (MOT) and is secondary to direct major injury or repeated minor trauma (2,3). MOT usually affects the quadriceps and brachial muscles; case reports in the head and neck are rare (5). We report a case of MOT affecting an accessory scalene muscle in the neck following major trauma.

Case Report

A 40-year-old woman was referred to our clinic for evaluation of left neck pain and firm mass. Patient’s medical history was significant for a snowmobile accident 3 months prior in which she sustained trauma to the left neck and a left humerous fracture treated with open reduction and internal fixation. Six weeks after initial trauma patient noted a left neck mass and associated “shooting” left neck pain, exacerbated with head turn or arm raise. Indomethacin (25 mg TID) was initiated, but the mass continued to slowly enlarge. Evaluation included CT of the neck, which suggested MOT. The mass and associated pain persisted and the decision was made for surgical excision in conjunction with hardware removal as a collaborative effort between orthopedic surgery and otolaryngology. One year after the initial trauma, the heterotopic bone was surgically excised.

Materials and Methods

Modified Operative Note: A horizontal incision was made in a skin crease in the patient’s left lower neck just above the clavicle. The incision was carried down through the platysma and a subcutaneous flap raised superiorly. The Parsons-McCabe nerve stimulator was used to identify the trapezius branch of the spinal accessory nerve (see Figure 2A,B). Dissection was done on the nerve to verify that it was cephalad to the heterotopic ossicles and not involving the mass. Dissection was done down to the heterotopic ossicles, and the mass then removed by the orthopedic surgery team after dissection on the capsule surrounding the mass (see Figure 2C,D). The mass was passed off for a specimen and the wound was copiously irrigated with sterile saline. The wound was then closed with deep 4-0 Monocryl and a subcutaneous running 4-0 Monocryl.

Results

The trapezius branch of the spinal accessory nerve was identified and excision of the heterotopic bone was accomplished without damage to the nerve. Pathologic examination of the 3.9 x 1.2 x 1.0 cm specimen confirmed the diagnosis of myositis ossificans. Follow-up has identified relief of pain for 11 months followed by mild return of discomfort. Patient has subsequently undergone left hemiarthroplasty for avascular necrosis of the humeral head. She has residual tightness in the region of MOT excision and continues with physical therapy. Now approaching two years post-excision, there is no evidence of recurrence on physical exam or imaging.

Discussion

Myositis ossificans traumatica (MOT) is a disorder of heterotopic bone formation occurring in response to soft tissue trauma. MOT is rare in the head and neck. The most common location in the head and neck is the masseter; other case reports have identified MOT in the sternocleidomastoid, buccinator, digastric, levator scapulae, omohyoid, trapezius, paraspinal muscles, pterygoid, middle and posterior scalene muscles, temporalis, and intrinsic muscles of the larynx. We report post-traumatic MOT in an accessory scalene muscle of the left neck in a 40-year-old woman. To our knowledge, this is the first report of MOT in an accessory scalene muscle (6).

Although rare in the head and neck, MOT is an important entity for the otolaryngologist to include in the differential diagnosis of head and neck mass. Early diagnosis of MOT may avoid unnecessary tests and procedures that carry high cost and potential morbidity (5). Diagnosis can be made with physical examination and imaging. CT is the gold standard for imaging evaluation, showing a characteristic zoning pattern with dense mineralization peripherally. If a specimen is obtained, histologic analysis shows a zone phenomenon: Central zone (mixed population of fibroblasts), middle zone (immature osteoid and cartilage), outer zone (bony trabeculae) (5,7).

In general, MOT is a benign, self-limiting disease that is frequently managed conservatively, for example with physical therapy, steroids, retinoids, NSAIDs, bisphosphonates, warfarin, and low-dose radiation therapy (8). Surgery should be considered if the heterotrophic bone interferes with joint mobility, leads to significant pain or functional limitation, or in order to obtain tissue for definitive histologic diagnosis (2.3). There is risk of recurrence following surgery, therefore treatment with NSAIDs or low-dose radiation therapy may be considered for prophylaxis. Given the young age of our patient and location of the lesion, radiation therapy was not pursued. There has been no evidence of recurrence in this patient.

Conclusions

This report describes the surgical treatment of a case of MOT that is unique given its location in an accessory scalene muscle of the left neck. In cases in which the heterotopic bone localizes to the head and neck soft tissues and surgery is indicated, the authors advocate for a collaborative approach between the otolaryngologist and orthopedic surgery colleagues.

References