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CASE-REPORTS

A Unique Pediatric Case of Myositis Ossificans Circumscripta in the Trapezius

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Abstract

Myositis ossificans (MO) is a focal ossification of soft tissue, most commonly striated muscle. There are various etiologies of MO, including traumatic, genetic, and idiopathic, with presentation typically consisting of a single lesion of heterotopic ossification within striated muscle. Incidence of MO within head and neck musculature is rare, and initial presentation can be difficult to differentiate from other etiologies, representing a significant challenge in appropriate diagnosis and management.

Keywords: Myositis ossificans circumscripta, trapezius, pediatric

1 | INTRODUCTION

Myositis ossificans is a benign, soft tissue condition characterized by heterotopic ossification of muscle. While the exact pathophysiology is unknown, it is generally understood to be a reactive response of mesenchymal stem cells to trauma or inflammation resulting in osteogenic fibroblast differentiation and proliferation. Presentation can be difficult to differentiate from musculoskeletal neoplasms, particularly when located in an uncommon site. We report a case of a pediatric patient with myositis ossificans in the posterior neck deep to the right trapezius involving the para-spinal musculature.

2 | CASE DESCRIPTION

A healthy 10 year old male presented with an isolated, persistent, and painful right posterior neck mass. The lesion was described as having rapid onset with no identified inciting event. It was first evaluated by a pediatrician, who prescribed Augmentin for presumed cervical lymphadenitis. After a week of antibiotic therapy with no improvement of symptoms, his pediatrician ordered a CT scan and referred him to a tertiary care center for evaluation.

The patient was jointly managed by otolaryngology and hematology/oncology. His physical exam identified a 3-4 cm tender mass inferior to the right superior nuchal line and deep to the trapezius, with no additional lesions or masses present. The outside CT scan demonstrated a large soft tissue mass concerning for sarcoma (Figure 1), and subsequent MRI showed a large, ill-defined, infiltrative mass, predominately in the right posterior paraspinal musculature at the level of C1 most concerning for fibrosarcoma or rhabdomyosarcoma. Other potential diagnoses included pseudotumor, aggressive fibromatosis, myositis ossificans, and malignant peripheral nerve sheath tumor. A CT of

the chest, abdomen and pelvis showed no other abnormalities.

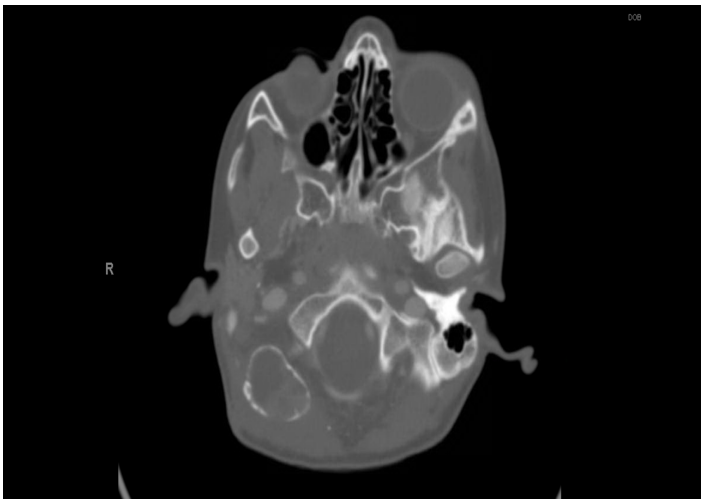

***Fig 1**. Initial MRI. Note the hyperintense ring deep in the right neck.*

FNA yielded insufficient tissue for definitive diagnosis, and open excisional biopsy was recommended. Meticulous dissection revealed boggy, abnormal appearing tissue which stood in contrast to the surrounding normal musculature. Frozen section demonstrated small blue cell tumor, and permanent pathology subsequently showed myxoid spindle cells and areas of osteoid in zonal pattern characteristic of myositis ossificans.

Post-operatively, our patient had eventual full return to baseline function without medical therapy given the diagnosis of myositis ossificans. A three month follow-up CT scan showed increased calcification and decreased size of the neoplasm over the interval. As the lesion was clinically and histologically benign and improving the decision was made to continue with rest, ice and NSAIDs in keeping with the typical treatment regimen.

3 | DISCUSSION

Myositis ossificans is a benign osteoid generating metaplasia of muscle. (1) It is categorized into three groups based on natural history. Myositis ossificans traumatica develops following trauma and makes up 60-75% of cases.(2) Myositis ossificans progressiva is caused by a rare autosomal dominant mutation on chromosome 2q23-24 that leads to progressive development of nodules and ossification of soft tissues.(3) Myositis ossificans circumscripta (MOC) accounts for remaining cases and has an unknown or idiopathic etiology.(1)

MO in the pediatric population typically occurs in the proximal extremities. (4) Our review of literature found four other cases of pediatric MOC in the head and neck, with no previous cases involving the trapezius and paraspinal musculature (Table 1). Myositis ossificans generally presents as a firm mass in soft tissues that causes variable pain and limitation to function that is location dependent at initial onset. The lesions then evolve into painless, hard, well-demarcated masses. Our patient presented earlier in his symptom time course than most reported cases of pediatric MO, but his symptoms were otherwise consistent with other literature.

***Table 1.** Summary of literature review of pediatric MOC in the neck.*

Authors [ref]	Sex	Age	Site	Time of Onset to Presentation	Radiological Findings	Lesion Size	Clinical Suspicion of Malignancy
Kokkosis, AA., Balsam, D., Lee TK. Schreiber JZ. Pediatric nontraumatic myositis ossificans of the neck. Pediatric Radiology. 2009 Apri;39(4):1432-1998	M	15	C3–C4 - Middle Posterior scalenes	3 weeks	Ring-like cluster calcifications, inflammation and edema	2.4 × 2.0 × 2.9 cm	Yes
Lin, TY. Wu, C., Chiang, FY. Kuo, WR. Ho, KY., Lee, KW. Noninfectious Painful Neck Mass Mimicking Malignancy In A Child. Head & Neck. 2010. 9999. 1043-I3074	F	12	L. semispinalis capitis	1 month	Heterogeneous mass with calcification and patchy enhancement at the edge	3.1- × 2.2- × 2.0-cm	Yes
Dudkiewicz, I., Salai, M., Chechik, A., A Young Athlete with myositis ossificans of the neck presenting as a soft tissue tumour. 2001. Arch Orthop Trauma Surg. 2001; 121:234-237.	F	17	Posterior neck, just below occiput	7 months	Necrotizing soft tissue or metastasis	5 × 7 × 8 cm	Yes
Barea, FL., Peralto, JL., Lopez, JL, Grueso, FS. Case report 694. Skeletal Radiol (1991) 20:539 542.	F	10	C3-6 - Splenius capitis, Semispinalis	2 months	well-defined ring of osseous density around a less dense, central area	4.5 x 3.5 x 3 cm	Yes

Radiologic appearance depends on the stage of the disease. The first weeks of symptoms typically correlate with soft tissue inflammation, and no calcification is evident. After 3-6 weeks a rim of calcification is evident, and mature disease shows peripheral rim-like calcifications with a bone marrow-like center.(5)

Supplementary information The online version of this article (https://doi.org/10.52845/JORR/2023/4.3.4) contains supplementary material, which is available to authorized users.

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This case showed intermediate stage disease with soft tissue swelling and the beginning of a rim of calcification which suggests a more rapid progression than what is widely reported in literature, however, another pediatric case involving the posterior neck muscles showed similarly rapid maturity.

Histologically early MO is hypercellular with prominent myxoid cells and fibroblasts and subsequently matures into a lesion with a cancellous bone appearing periphery with central marrow. Laboratory tests are generally unremarkable, although elevated SED rates are reported.(1),(2)

The rapid progression, and unusual location for typical MOC placed it low on the differential and made the work-up for what was presumed to be a neoplastic process appropriate. We managed the lesion with an open biopsy whereas in all other reported cases wide resection was performed. This allowed conservative treatment with minimal morbidity following the benign biopsy. Conservative treatment with rest, ice and NSAIDs generally is successful1 and was our approach.

4 | CONCLUSION

Non traumatic MO or MOC in the head and neck is a rare finding, however, it should be considered in the evaluation and management of rapidly progressing soft tissues lesions with calcification in the head and neck. As MOC can be treated conservatively with rest, ice, and nonsteroidal anti-inflammatory agents, proper diagnosis is important to ensure the least morbid medical course in these patients.

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