

A rare case of focal myositis affecting the sternocleidomastoid muscle: diagnostic challenges and management strategies

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Introduction. Focal myositis is a rare inflammatory disease characterised by localised involvement of a single muscle or muscle group. Involvement of the sternocleidomastoid muscle represents an extremely rare localisation.

Materials and methods. We report the case of a 78-year-old woman who developed progressive left laterocervical swelling and pain following a respiratory infection. Extensive clinical and radiological investigations were performed; however, a definitive diagnosis was achieved only after muscle biopsy.

Results. The patient initially responded to corticosteroid therapy but subsequently developed steroid dependence. For long-term disease control, methotrexate was introduced as a steroid-sparing agent. The clinical course was notable for recurrent disease exacerbations associated with fever. **Discussion.** This case presents several distinctive features, including occurrence in an elderly patient, the presence of fever during disease flares, and a steroid-dependent course requiring second-line immunosuppressive therapy. These aspects contribute to the diagnostic and therapeutic complexity of focal myositis, particularly in atypical localisations.

Conclusion. Our experience highlights the diagnostic challenges associated with this rare entity and suggests that prolonged immunosuppressive treatment may be necessary in selected patients with focal myositis.

Key words: case report, focal myositis, sternocleidomastoid muscle, muscle mass, immunosuppressive therapy

Received: June 26, 2025

Accepted: September 2, 2025

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How to cite this article: Moliterno N, Parisi M, Gagliardi D, et al. A rare case of focal myositis affecting the sternocleidomastoid muscle: diagnostic challenges and management strategies. *Acta Myol* 2025;44:126-129. <https://doi.org/10.36185/2532-1900-1552>

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Introduction

Focal myositis is a rare inflammatory disease of skeletal muscle, manifesting as localized mass limited to a single muscle or muscle group. This condition is differentiated from others inflammatory myopathies by its focal nature and absence of systemic involvement with generally a favorable prognosis ^{1,2}.

Various factors have been proposed as potential triggers including trauma, denervation, infection, autoimmune processes and ischemia, however the etiology is still not clear ³.

In most cases the disease affects the lower limbs, particularly the quadriceps and gastrocnemius muscles. However, involvement of other muscles, including those in the upper extremities, trunk, head and neck region has been reported ¹⁻⁵. Only few cases of focal myositis of sternocleidomastoid muscle have been published in literature ^{2,3,6-8}. We aim to present a case of focal myositis affecting the sternocleidomastoid muscle in a 78-year-old woman, highlighting the diagnostic challenges and management strategies, and providing a review of the current literature of this rare condition.

Case presentation

A 78-year-old woman was referred to our neuromuscular disease clinic for evaluation of progressive swelling and pain in the left laterocervical area, which had persisted for several months. Her past medical history included hypothyroidism, hysterectomy for uterine cancer (1989) and atrial fibrillation. Her chronic medications included levothyroxine, edoxaban and esomeprazole. In April 2024, following an episode of respiratory infection, she developed progressive swelling and pain in the left laterocervical region. Initial investigations ordered by her primary care physician included a neck ultrasound, which revealed reactive lymphadenopathy in the left laterocervical region. Otorhinolaryngological evaluation noted increased consistency of the sternocleidomastoid muscle and left submandibular pain without detectable masses. Despite prescribed analgesic and muscle relaxant therapy, the swelling persisted, though pain improved. A contrast-enhanced computed tomography (CT) scan revealed thickening of the left sternocleidomastoid muscle and surrounding soft tissues, with diffuse lymphadenopathy (Fig. 1). In late July 2024, she experienced clinical worsening with increased swelling and fever (38°C), prompting an emergency department visit. She was prescribed cefpodoxime 200 mg twice a day for 6 days and prednisone 25 mg/day for 7 days with subsequent tapering, which provided temporary improvement.

An MRI performed in August 2024 confirmed diffuse inflammation of the left sternocleidomastoid muscle and surrounding soft tissue edema (Fig. 1). During the steroid tapering period, the patient experienced worsening of her local condition, necessitating further specialist referrals.

Following a consultation with the infectious disease specialist, quantiferon was performed, which demonstrated a latent tuberculosis infection. Comprehensive laboratory investigations were ordered, including complete blood count, inflammatory markers, creatine phosphokinase (CPK), and autoimmune serologies. Results showed intermittent leukocytosis up to 20 000/mm³ (normal values 4000-10000) and increased CRP up to 30 mg/L (normal values < 5 mg/L). CPK levels were normal.

Neurological evaluation found pain in the left laterocervical region triggered by specific head movements, without weakness of the trapezius muscles or other neurological deficits. Electromyography demonstrated early recruitment of low amplitude, short duration motor unit potential, expressive of myopathic changes in the left sternocleidomastoid muscles, without evidence of involvement of other muscular districts nor active denervation.

To establish a definitive diagnosis and rule out malignancy or infection, muscular biopsy of the sternocleidomastoid muscle was performed. Histopathological examination revealed striated muscle with focal endomysial inflammatory infiltrates containing macrophages, without evidence of granulomatous inflammation, vasculitis, or malignancy (Fig. 2). Bacterial and mycobacterial studies on the biopsy specimen were negative. These findings, in conjunction with the clinical and radiological picture, confirmed the diagnosis of focal myositis.

Given the positive QuantiFERON-TB test and the anticipated need for immunosuppressive therapy, prophylactic treatment for latent tuberculosis infection was initiated with isoniazid and vitamin B supplementation.

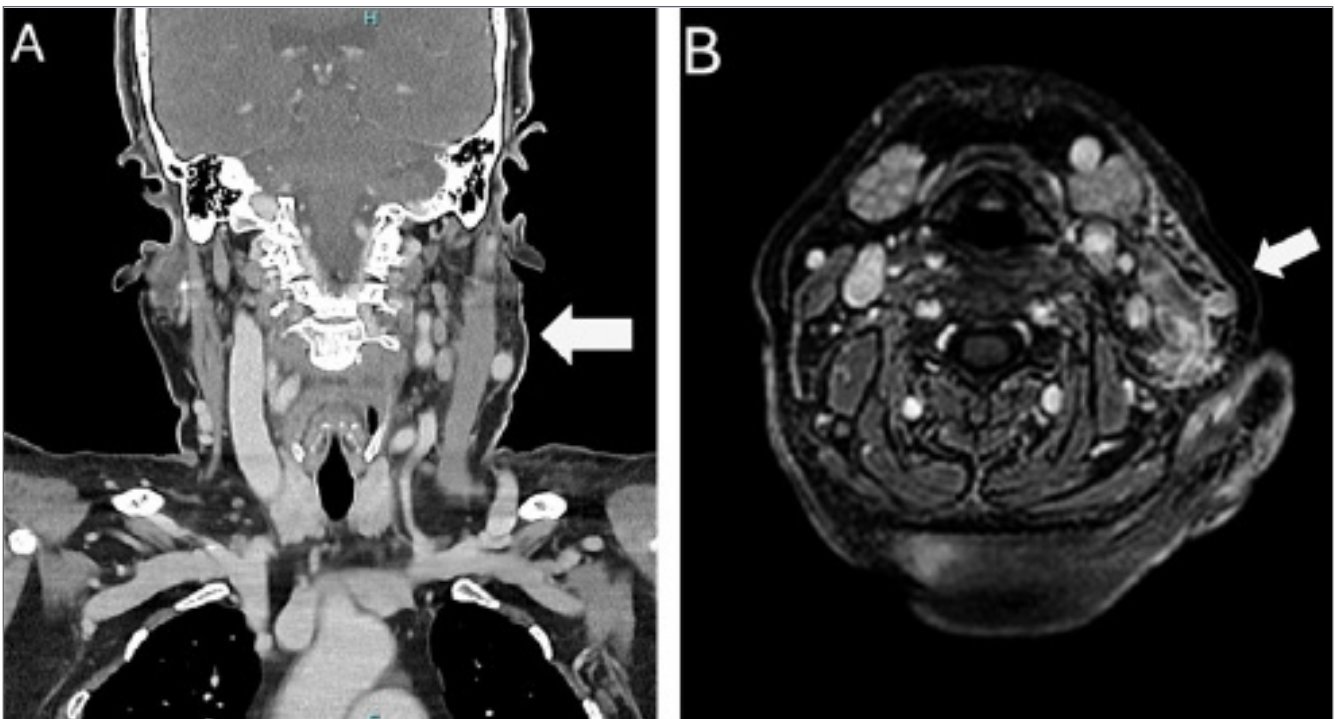


Figure 1. Imaging findings. (A) Neck CT scan: asymmetric thickening of the left sternocleidomastoid muscle with associated soft tissue swelling (B) Axial MRI (T1-weighted post-gadolinium): extensive inflammatory involvement of the left sternocleidomastoid muscle with contrast enhancement and adjacent soft tissue edema.

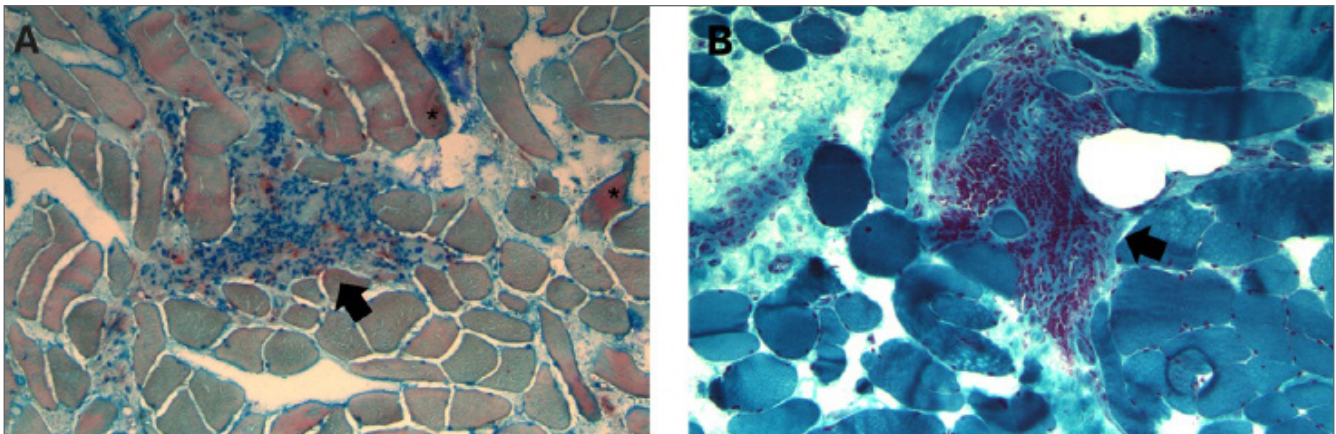


Figure 2. Left sternocleidomastoid muscle biopsy histopathology: (A) Acid phosphatase. Cytoplasmic positivity in degenerating muscle fibers (asterisks) and presence of some macrophages within the endomysial infiltrates (black arrow). (B) Modified Gomori trichrome stain. Evidence of a conspicuous endomysial cellular infiltrate (black arrow) (Magnification 200x).

Initial management with prednisone 20 mg/day provided partial symptom control. However, due to persistent pain and the need for continued corticosteroid therapy at dosage superior to 10 mg/day, methotrexate was introduced in October 2024, with a gradual dose escalation protocol to 25 mg weekly, accompanied by folinic acid supplementation.

Over the following months, the patient experienced gradual improvement in her laterocervical swelling and pain. A follow-up musculoskeletal MRI performed in December 2024 showed no active muscle inflammation and laboratory parameters had normalized.

An attempt to discontinue corticosteroids in early 2025 led to symptom exacerbation, low-dose (2.5 mg/day) prednisone was reintroduced, and methotrexate was continued, with subsequent symptom improvement.

By her last evaluation in March 2025, the patient showed significant clinical improvement with reduced laterocervical swelling and pain. She continued a maintenance regimen of methotrexate, low-dose prednisone, and isoniazid prophylaxis, with regular multidisciplinary follow-up planned.

Discussion

Focal myositis of sternocleidomastoid muscle represents a particularly uncommon localization within the already rare spectrum of focal myositis.

Clinically presents as a rapid growing localized mass within a single muscle or muscles group that may be associated with pain as observed in our patient. Systemic symptoms such as fever are uncommon, although our patient did experience fever during the acute exacerbation of her condition.²

The etiology is still unknown, various triggers have been proposed including trauma, denervation, infection, autoimmune processes, and ischemia.^{2,3} In our patient, the temporal relationship between a preceding respiratory infection and the subsequent development of focal myositis suggests the possibility of a post-infectious immune-mediated mechanism, however, no specific infectious agent was identified despite extensive microbiological investigations. Immune dysregula-

tion mechanism is also suggested by the symptomatic worsening following corticosteroid tapering and the histopathological features of endomysial inflammatory cellular infiltrates.

Laboratory findings are not specific, inflammatory markers can be slightly elevated with CK values within normal limits, as in our patient, unlike other inflammatory myopathies such as polymyositis or dermatomyositis. No specific autoantibodies have been identified in focal myositis.²

Imaging techniques, particularly muscle MRI, serve a crucial diagnostic role, showing focal enlargement of the affected muscle with increased signal on T2-weighted sequences reflecting inflammatory changes.^{2,3,9} These radiological features are suggestive of inflammatory myopathy but lack of absolute specificity, so muscle biopsy is performed in most cases to confirm the diagnosis and exclude other causes.

Histopathological features include inflammatory cell infiltrates in the endomysial and perimysial compartments.^{2,3} In our case, muscle biopsy showed endomysial inflammatory infiltrates, aligned with these previous observations.

The differential diagnosis of focal myositis is broad, considering the non-specific presentation feature of a localized muscle mass, includes infectious and proliferative myositis, nodular fasciitis, soft tissue malignancy and localized manifestations of systemic inflammatory myopathies.³

In our case mycobacterial myositis was initially suspected due to the positive QuantiFERON-TB test, however the absence of granulomatous inflammation on biopsy, negative mycobacterial studies and normal chest X-ray excluded this diagnosis.

Neoplastic conditions, such as benign soft tissue tumors or malignant sarcomas, as well as other inflammatory pseudotumors, such as proliferative myositis and nodular fasciitis, were excluded with muscle biopsy. Due to the rarity of the condition and the heterogeneity in the localization and severity of presentation, the management of focal myositis is not standardized. In several cases, especially those with indolent or mild symptoms, spontaneous resolution has been observed in the absence of specific treatment.³

The most severe cases, in which pain is a prominent symptom, generally respond favorably to corticosteroids, as in the case of our patient. The initial dosage usually ranges from 0.5 to 1 mg/kg/day of prednisone or equivalent, with a gradual taper over 4-12 weeks. For cases

that are refractory to corticosteroids or when steroid-sparing is desirable, a second line immunosuppressive agents may be employed. Our patient demonstrated a favorable response to methotrexate, allowing for a reduction in corticosteroid dosage and better symptom control. Recurrence, which usually occurs in the same muscle affected by the first localized inflammatory process, is generally uncommon^{2,3}. Furthermore, while progression from localized to systemic forms has occasionally been documented for other anatomical localizations, this spread has never been reported for focal myositis of the sternocleidomastoid^{6,7,8}.

Our case share light on several interesting and peculiar features such as the uncommon occurrence of sternocleidomastoid focal myositis in an elderly patient, the presence of fever during disease exacerbations and the development of steroid dependence necessitating second line immunosuppressive agent, expanding our knowledge of the clinical spectrum of this rare entity

Conclusions

Focal myositis of the sternocleidomastoid is a rare inflammatory condition, generally with a favorable prognosis, which enters into differential diagnosis with various diseases that can manifest as a localized mass with rapid growth. For a correct diagnosis, a global evaluation is important to exclude conditions that require different approaches such as neoplasms or infections.

Management of this condition should be personalized. While some patients experience spontaneous resolution, others, as in our case, require immunosuppressive therapy, with corticosteroids usually representing an effective first-line therapy.

In steroid-refractory cases or in cases of steroid dependence, it is necessary to add a steroid-sparing agent such as methotrexate with good clinical response.

The possibility of recurrence and/or systemic spread of the inflammatory process requires long-term follow-up and active surveillance especially if therapeutic changes or reductions occur.

Our case adds to the limited scientific literature of focal sternocleidomastoid myositis and offers insights that may help in the recognition and management of this entity to improve patient outcomes.

Acknowledgements

This work is carried out within the European Reference Network for Neuromuscular Diseases (ERN EURO-NMD). ERN EURO-NMD is funded by the European Union under the EU4Health programme 2021-2027 (Grant agreement n°101156434).

Funding

This study was funded by the RC2025 Ministry of Health to S.C.

Conflict of interest statement

The authors declare that there is no conflict of interest.

Authors contributions

NM: Conceptualization; Data curation; Formal analysis; Investigation; Methodology; Project administration; Resources; Software; Supervi-

sion; Validation; Visualization; Writing – original draft. MP: Conceptualization; Data curation; Formal analysis; Investigation; Methodology; Project administration; Resources; Software; Supervision; Validation; Visualization; Writing – review & editing. DG: Conceptualization; Data curation; Formal analysis; Investigation; Methodology; Project administration; Resources; Software; Supervision; Validation; Visualization; Writing – review & editing. SC: Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Resources; Software; Supervision; Validation; Visualization; Writing – review & editing. DV: Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Resources; Software; Supervision; Validation; Visualization; Writing – review & editing.

Ethical consideration

We confirm that we have read the Journal's position on issues involved in ethical publication and affirm that this report is consistent with those guidelines. This case report was approved by the Ethics Committee of Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico (protocol number: 186771).

Written informed consent was obtained from the patient for their anonymized information to be published in this article.

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