

# Pyomyositis of the Sternocleidomastoid Muscle after Tooth Extraction: A Case Report

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## ABSTRACT

Pyomyositis is a primary bacterial infection of the striated muscle. The sternocleidomastoid muscle (SCM) is rarely involved in pyomyositis because of its excellent blood supply from the branches of the external carotid artery. In this study, we present the report of a 67-year-old male with an uncommon case of pyomyositis of the sternocleidomastoid muscle who had been taking methylprednisolone and isoniazid for rheumatoid arthritis and latent tuberculosis, respectively. The infection in the SCM occurred after the drainage of an abscess in the left submandibular and sublingual space that appeared after extraction of a tooth. Although pyomyositis of the head and neck area is rare, it can lead to severe complications, and even death, if treated improperly. It is also known that patients with reduced immunity are susceptible to these infections. Therefore, if cervical edema or redness is observed in immunocompromised patients, a more intensive clinical and radiographic examination is recommended for differential diagnosis of pyomyositis.

**Key words :** Pyomyositis, Abscess, Sternocleidomastoid muscle

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## INTRODUCTION

Pyogenic myositis (pyomyositis) is a primary bacterial infection of the striated muscles<sup>1-3</sup>, usually caused by *Staphylococcus aureus* and predominantly occurring in the tropics<sup>3</sup>. It is more common in immunocompromised patients, such as those with diabetes mellitus, acquired immune deficiency syndrome, hematopoietic disorders, autoimmune diseases, or chronic liver diseases. Patients treated with drugs, such as prednisolone and azathioprine, are also susceptible to infectious complications<sup>2,4-6</sup>.

Reports of pyomyositis of the head and neck areas are scarce<sup>3,7</sup>. Infections in this location comprise approximately 0.5~4% of all cases, with the most frequent causes being dental and tonsil infections and trauma<sup>8</sup>. It is exceptionally rare for the sternocleidomastoid muscle (SCM) to be involved in pyomyositis because of its excellent blood supply from the branches of the external carotid artery; these branches include the sternocleidomastoid branch of the superior thyroid artery and the sternocleidomastoid branch of the occipital artery<sup>3,9</sup>. Herein, we present an uncommon case of pyomyositis of the sternocleidomastoid muscle with a literature review.

## CASE REPORT

In February 2018, a 67-year-old man visited the Depart-

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Figure 1. Computed tomography images demonstrating pus collection in the left sublingual space (A) and submandibular space (B). No abnormalities were observed in the sternocleidomastoid muscle area (C).

Table 1. Laboratory findings of inflammatory markers

	Initial visit	13 days after initial incision and drainage (Prior to discharge)
White blood cell count ( $\mu\text{L}$ )	23,810	10,800
Neutrophil percentage (%)	89.7	65.0
C-reactive protein levels (mg/L)	239.7	6.6

ment of Oral and Maxillofacial Surgery in Gangnam Severance Hospital complaining of persistent pain that appeared after the extraction of his lower left second premolar at a dental clinic 11 days earlier. He underwent the tooth extraction, due to persistent pain after the root-canal treatment, and was given antibiotics after the surgery. Clinical examination revealed the formation of granulation tissue and pus draining from the extraction socket. The patient reported taking methylprednisolone and isoniazid for rheumatoid arthritis and latent tuberculosis, respectively.

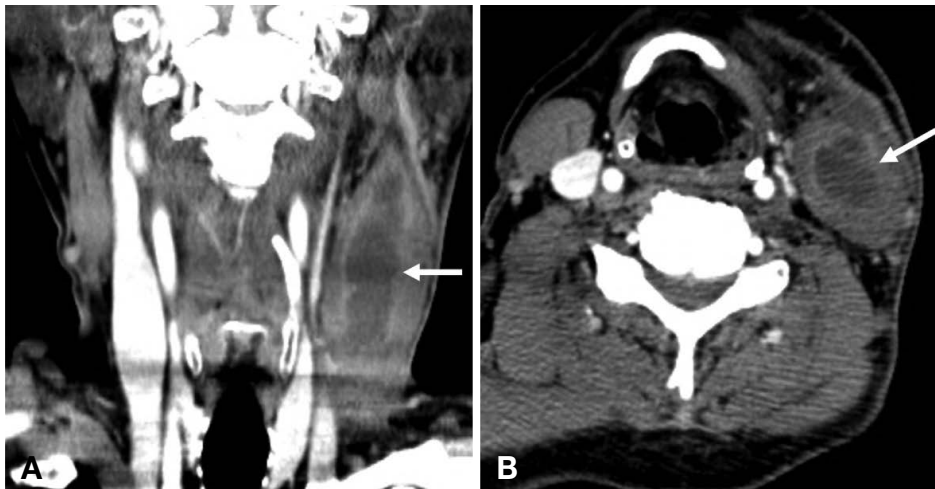
After the initial visit, the patient did not return for his follow-up appointment; however, he revisited the hospital six days later, complaining of facial swelling and odynophagia. A clinical examination showed moderate swelling, induration, and tenderness of the left submandibular area. His ability to open his mouth was limited to 20 mm, and the patient complained of chills. Laboratory findings revealed an elevated white blood cell count (23,810/ $\mu\text{L}$ , normal range: 4,000~10,800/ $\mu\text{L}$ ), neutrophil percentage (89.7%, normal range: 40~73%) and C-reactive protein levels (239.7 mg/L, normal range: 0.1~6.0 mg/L) (Table 1). We performed contrast-enhanced computed tomography (CT), which revealed



Figure 2. Six days after the first incision and drainage, swelling and redness were observed in the left sternocleidomastoid muscle area.

pus aggregation in the sublingual and submandibular spaces (Fig 1), indicating an abscess. We performed an intra-oral incision and drainage of the abscess under local anesthesia and had a specimen cultured. The culture showed the presence of Gram-positive  $\alpha$ -Streptococcus. Antibiotic therapy was administered (Flumarin, Flomoxef, 2<sup>nd</sup> generation cephalosporin, Ildong Pharmaceutical Co., Ltd.), and copious irrigation was done daily.

Six days after the initial incision and drainage procedure, obvious swelling and pain appeared in the patient's left neck area (Fig 2). A repeat contrast-enhanced CT revealed an ab-



**Figure 3.** Coronal (A) and axial (B) computed tomography images demonstrating pus collection throughout the left sternocleidomastoid muscle.

cess affecting the entire length of the left sternocleidomastoid muscle (Fig 3). Under general anesthesia, an incision about 1 cm in length was made at the most fluctuant area of the SCM. At that time, a large quantity of a purulent discharge was drained.

A culture of this drainage revealed the presence of *Streptococcus constellatus*, a Gram-positive coccus that is sensitive to second-generation cephalosporins. Daily dressings and antibiotic therapy (Flumarin, Flomoxef, Ildong Pharmaceutical Co., Ltd.) were continued for 13 days after the initial incision and drainage.

Prior to patient discharge, his ability to open his mouth increased gradually to 46 mm. Additional laboratory testing found improved white blood cell count (9,470/ $\mu$ L, normal range: 4,000~10,800/ $\mu$ L), neutrophil percentage (65.0%, normal range: 40~73%) and C-reactive protein levels (6.6 mg/L, normal range: 0.1~6.0 mg/L) (Table 1). The patient has recovered well.

## DISCUSSION

Herein, we present an uncommon case of pyogenic myositis (pyomyositis) of the sternocleidomastoid muscle. Pyogenic myositis (pyomyositis) is a primary bacterial infection of the striated muscle, typically affecting the extremities<sup>1-3</sup>. According to Gosnell et al., such an infection in the sternocleidomastoid muscle is infrequent, with about seven cases reported over the last two decades<sup>3</sup>.

Pyomyositis is more common in immunocompromised patients, and it is known that patients being treated with

drugs such as prednisolone and azathioprine are more susceptible<sup>2,4,5</sup>. In this case, the patient had been taking methylprednisolone for rheumatoid arthritis and isoniazid because of latent tuberculosis. Despite being treated with antibiotics, a sublingual and submandibular space abscess was found after a simple extraction of a mandibular premolar. Six days after the incision and drainage, pyomyositis was found in the left sternocleidomastoid muscle area. This may have been due to the patient's reduced immunity.

On the 4th day after the incision and drainage, a bacterial culture of the left SCM showed that *Streptococcus constellatus* was the causative agent. This bacterium is endogenous to the normal flora of the oral cavity, urogenital region, and intestinal tract. However, it is known that it can frequently cause purulent infections in other parts of the body<sup>10</sup>. It can be assumed that oral bacteria were infiltrated during the extraction due to the patient's reduced immunity, and the spread of this bacterium caused pyomyositis of the left sternocleidomastoid muscle.

According to the literature, the etiology of myositis is associated with temporary bacteremia in the location of muscle damage. *S. aureus* is known to be the most common causative agent, while *streptococci* are known as the second most common cause<sup>1,2,11</sup>. Therefore, we recommend the administration of broad-spectrum antibiotics covering *S. aureus* and *streptococci* before the acquisition of the bacterial culture results.

Pyomyositis of the head and neck area is rare, but if treated improperly, it can lead to death through internal jugular vein thrombosis and sepsis<sup>3</sup>. Therefore, if cervical edema or redness is observed in immunocompromised patients, a

differential diagnosis of pyomyositis through active clinical and radiographic examination is recommended. After diagnosis, appropriate antibiotic administration is recommended, and surgical intervention should be performed for patients with evidence of pus collection.

## DISCLOSURE OF INTEREST

The authors declare that they have no competing interests.

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