

# Abscess Lodged Within the Sternocleidomastoid Muscle Secondary to Septic Arthritis

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## Abstract:

In deep neck space infections, structures within the fascial compartments may become compromised, leading to neurovascular, bony, or airway issues. Most commonly, infections of the oral cavity, face, or superficial neck spread through the lymphatics into the deeper tissues, causing lymphadenopathy and suppurative fluid collection leading to abscess formation.

While some neck abscesses occur idiopathically, a retrospective review found that dental infection was the most common etiology (43%), followed by intravenous (IV) drug use (12%) and tonsillitis (6%). In contrast, our patient denied IV drug usage and had no significant medical or dental history that could account for her symptoms. Instead, she developed her neck abscess secondary to septic arthritis of the knee. Although synchronous localized infection of multiple sites is possible, cultures taken from the knee and the neck were both sensitive to Methicillin Resistant Staphylococcus Aureus (MRSA), indicating that the abscess likely formed secondary to septic arthritis. Furthermore, the patient's history of diabetes likely contributed to the progression of the infection.

Rarely does a knee infection travel hematogenously and seed within the neck. Moreover, the abscess was lodged within the middle of the sternocleidomastoid muscle rather than within the fascial compartments. Physicians in the future should be aware of this distinct presentation of deep neck space abscesses.

**Key words:** abscess; sternocleidomastoid; septic arthritis; mrsa

## Introduction

The anatomy of the neck is complex, containing important vessels and nerves [1]. In deep neck space infections, structures within the fascial compartments may become compromised, leading to neurovascular, bony, or airway issues [1]. Most commonly, infections of the oral cavity, face, or superficial neck spread through the lymphatics into the deeper tissues, causing lymphadenopathy and suppurative fluid collection leading to abscess formation. [1]. Patients with such complications commonly present with pain, fever, and dysphagia, with intravenous drug abuse being the most common etiology [2].

While the advent of antibiotics has decreased the incidence of deep neck abscesses, substance abuse and lack of primary medical and dental care still pose significant risks [1, 3]. Furthermore, patients with diabetes are at increased risk for soft tissue infections due to immune dysregulation caused by hyperglycemia [4]. In this report, we present a unique case of

an abscess lodged within the sternocleidomastoid muscle in the setting of septic arthritis secondary to infection of an ankle plate. The patient denies any intravenous (IV) drug use and presented with no history of recent dental procedures.

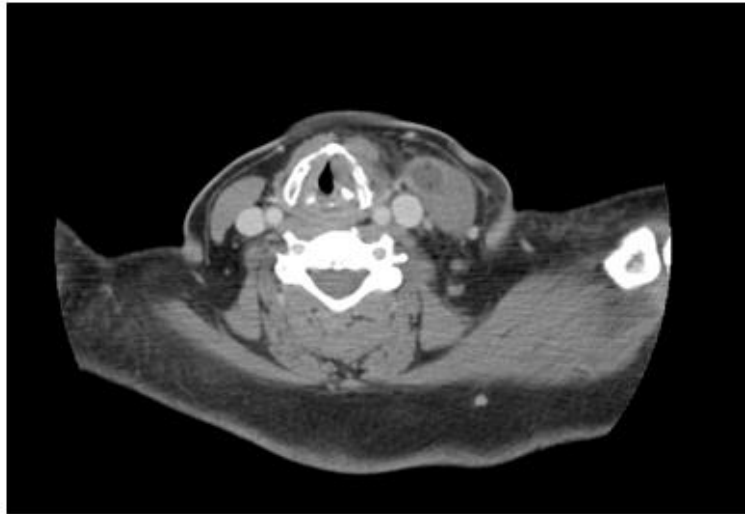
## Case Presentation:

The patient is a 45-year-old female with a history of poorly controlled diabetes, lupus, and alcohol abuse who presented to the emergency department with multiple falls and pain over the left knee, left ankle, and left lateral neck. Past surgical history was significant for left ankle hardware placed four years ago, which became infected two years later and resolved with incision and drainage (I&D). On arrival, her white blood cell (WBC) was elevated to 17.24. She was placed on IV vancomycin, and the otolaryngology team was consulted for the left neck

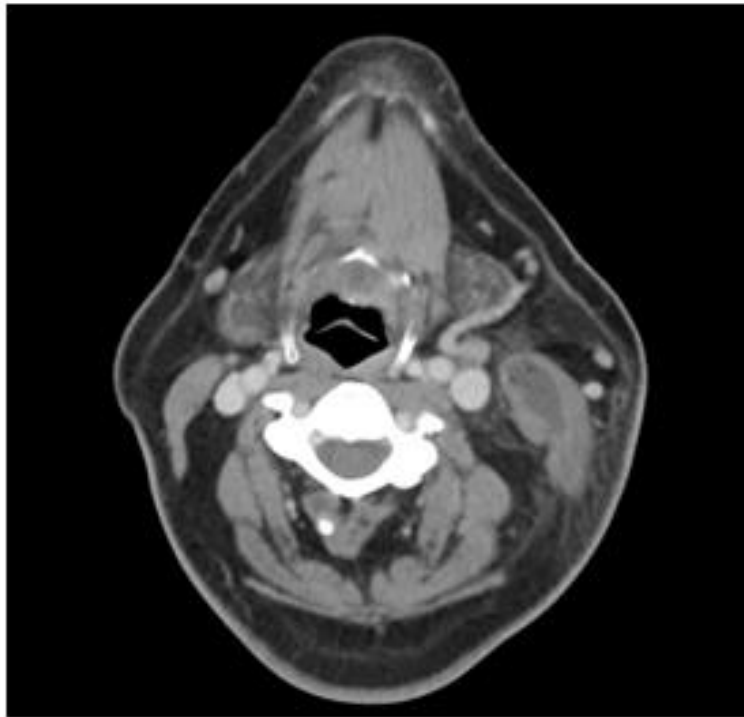
swelling, which began two days prior. The patient noted odynophagia but denied difficulty breathing and IV drug use, confirmed through urinalysis. Computed tomography (CT) of the neck was significant for a 1.5 cm x 1.4 cm x 13 cm peripherally enhancing air-fluid collection within the left sternocleidomastoid muscle, with adjacent soft tissue edema and involvement of the sternoclavicular joint (Figures 1,2, and 3). The orthopedics team examined the left ankle and knee, which was notable for cellulitis of the left ankle and septic arthritis of the left knee (Figure 4).

The patient was taken to the operating room. A 2 cm incision was made one finger length above the clavicle and through the cutaneous layer and platysma, down to the left sternocleidomastoid muscle. A tonsil clamp

was then used to bluntly poke into the muscle and into the abscess pocket, where copious amounts of purulence were expressed. The team bluntly dissected the plane of the muscle superiorly. The abscess pocket was then irrigated with normal saline, and two 12 French red rubbers were placed into the abscess pocket. The orthopedics team irrigated and drained the left knee under the same general anesthesia, and the left ankle plate was removed from the patient two days later. It is important to note that blood cultures and cultures from I&D of the neck abscess and left knee were all positive for methicillin-resistant staph aureus (MRSA). The red rubbers were removed, and the patient was discharged a week later with six weeks of IV daptomycin with rifampin, followed by another six weeks of oral (PO) doxycycline.



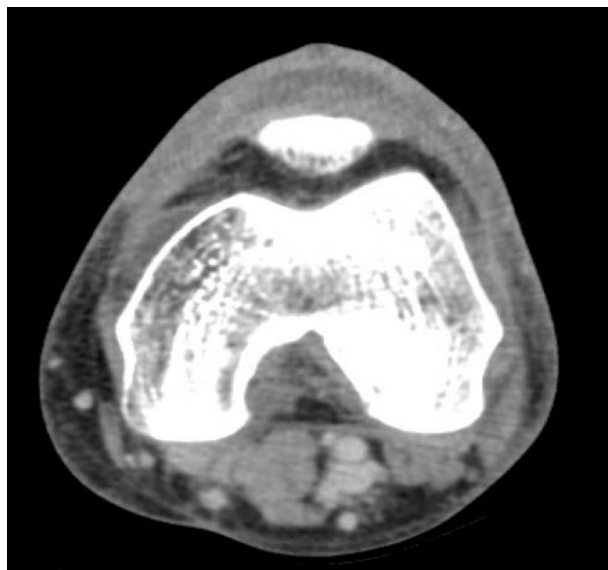
**Figure 1:** Hypoattenuating lesion within the left sternocleidomastoid muscle at the level of the thyroid glands.



**Figure 2:** Hypoattenuating lesion within the left sternocleidomastoid muscle at the level of the tongue.



**Figure 3:** Hypoattenuating lesion at the sternoclavicular joint



**Figure 4:** Hypoattenuating structure anterior to the left knee, with some areas of peripheral enhancement

### Discussion:

The introduction of antibiotics has reduced the occurrence of deep neck abscesses, but substance abuse and inadequate primary medical and dental care still pose significant risks [1, 3]. While some neck abscesses do not have an identifiable cause, a retrospective analysis revealed dental infections as the leading cause (43%), followed by IV drug use (12%) and tonsillitis (6%) [2, 3]. In contrast, our patient developed her abscess in the setting of septic arthritis secondary to an infected ankle plate. Previous literature has reported an abscess to the calf secondary to septic arthritis of the knee [5]. However, any extra-articular abscess associated with septic arthritis is rare. [5]

While synchronous localized infections in the lower extremity and neck are conceivable, cultures obtained from both the knee and the neck were sensitive to MRSA. Moreover, patients with diabetes are predisposed to presenting with unusual infections due to the hematogenous spread of microbes [6]. The hyperglycemic environment in diabetes compromises the body's immune and inflammatory response [7]. Neutrophil function, as well as the antioxidant system, are depressed, leading to immune dysfunction and heightened susceptibility to bacterial infections [4, 7].

Traditionally, deep neck abscesses primarily manifest in the superficial or deep spaces of the anterior triangle (28%), submandibular space (26%), and the posterior triangle (24%) [2]. Interestingly, the patient's abscess was lodged within muscle rather than the surrounding fascial space. Although there have been few reported cases of intramuscular abscesses in the sternocleidomastoid muscle, they varied in etiology, occurring post-intramuscular stimulation or idiopathically [8-10]. Other case reports have noted tropical pyomyositis in the sternocleidomastoid muscle but excluded any abscess formation [11].

The most common causative organisms in deep neck space abscesses include *Streptococcus viridans* (39%), *Staphylococcus epidermidis* (22%), and *Staphylococcus aureus* (22%) [3]. Affected patients usually have elevated WBC counts, with a mean of 15,500 cells per cubic millimeter [3]. Similarly, the causative organism of our patient's abscess was MRSA, and her WBC count at admission remained within the mean range. The standard of care for neck abscesses includes antimicrobial therapy (100%) and surgical drainage (73%), while a few are treated with needle aspirations (13.4%) [12]. Post-surgical drains can be placed in the abscess pocket until daily drainage falls under 25 ml [13]. Most abscesses resolve after treatment, as seen in our patient. However, complications

may occur if antibiotics do not respond, leading to airway obstruction (10.3%), upper gastrointestinal bleeding (3.2%), mediastinitis (2.7%), and sepsis (2.2%) [12]. These complications may lead to death (1.6%), especially in patients with sepsis and systemic disease such as diabetes mellitus [12].

### Conclusion:

Deep neck space abscesses are commonly caused by IV drug use or odontogenic infections [3]. Rarely does an ankle or knee infection travel hematogenously and seed within the neck. Moreover, the abscess was lodged within the middle of the sternocleidomastoid muscle rather than within the fascial compartments. Physicians in the future should be aware of this distinct presentation of deep neck space abscesses, especially in patients who are diabetic.

**Data Availability:** n/a

**Conflicts of interest:** The authors declare that they have no competing interests

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