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Streptococcus agalactiae-Induced Soft Tissue Infection in a Nonpregnant Adult After a Gynecological Procedure

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

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Conflict of interest: None declared

Patient: Female, 24-year-old
Final Diagnosis: Necrotizing fasciitis
Symptoms: Chest pain • chills • fatigue • fever • neck pain • range of motion limitation • right shoulder pain
Medication: —
Clinical Procedure: —
Specialty: Infectious Diseases • General and Internal Medicine • Obstetrics and Gynecology

Objective: Unusual clinical course

Background: We present a case of a 24-year-old woman with type 1- diabetes mellitus who developed necrotizing fasciitis (NF) due to *Streptococcus agalactiae* after a recent colposcopy. Literature review suggests this as the first case to be reported.

Case Report: The patient initially presented to the emergency department (ED) with right lower neck pain and spasm of the right sternocleidomastoid muscle (SCM), with decreased range of motion. She was diagnosed with torticollis and was sent home on a nonsteroidal anti-inflammatory drug and spasmolytic. She returned 5 days later because of a lack of response. Magnetic resonance imaging of her neck revealed edema and inflammatory changes in the distal portion of her right SCM; an oral-systemic steroid was added to her treatment. However, she presented to the ED 3 days after her second visit with worsening symptoms. Her complaints of severe pain involving the right chest wall, development of fever, and the findings on imaging studies prompted the diagnosis of necrotizing soft-tissue infection and NF. She promptly underwent successful surgical debridement. Tissue cultures grew abundant *Streptococcus agalactiae*. Her antibiotics were readjusted and she was discharged to rehabilitation. Retrospective analysis of the case was notable for colposcopy with cervical biopsy and endocervical curettage for chronic cervicitis and low-grade squamous intraepithelial lesion within a week of her first ED visit.

Conclusions: NF caused by *Streptococcus agalactiae* should be suspected in patients who have had recent genitourinary/gastrointestinal procedures.

MeSH Keywords: Colposcopy • Diabetes Mellitus • Fasciitis, Necrotizing • *Streptococcus agalactiae* • Uterine Cervicitis

Full-text PDF: https://www.amjcaserep.com/abstract/index/idArt/924110

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Background

Necrotizing fasciitis (NF) is a rare but serious infection of the subcutaneous tissue and fascia that may progress to affect the overlying skin, the underlying muscle, deep fascia, and bone [1–3]. With atypical presentation or delayed diagnosis, late- stage findings of tense edema, bullae, grayish-brown discharge, and crepitation could manifest and are commonly associated with poor prognosis [3].

Four types of NF have been described [4]. Type 1 is due to polymicrobial infection [5] and represents 70–80% of cases [4], type 2 is due to monomicrobial infection [4], type 3 is caused by gram-negative monomicrobial infection including marine-related organisms [4], and type 4 has a fungal etiology [4]. Predisposing risk factors for the development of NF are immunocompromised states such as diabetes (56% of all cases), cancer, alcohol abuse, age greater than 60 years, immunodeficiencies, malnutrition, chronic renal failure, liver cirrhosis, and use of steroids or other immunosuppressive drugs [1,2,4]. Recent instrumentation, odontogenic infection, and penetrating injury are also important risk factors that have been implicated [2,5]. Though the most common sites affected by NF are the lower extremities, abdomen, and the perineum [4], involvement of other sites such as the head and neck, upper extremities, and thorax have been described [6,7]. The most common microbes that have been isolated are *Streptococcus pyogenes*, *Staphylococcus aureus*, and *Clostridium perfringens* [1], although *Escherichia coli*, *Pseudomonas* spp., *Bacteroides* spp., *Klebsiella pneumoniae*, and *Streptococcus agalactiae* have also been reported [7].

Case Report

A 24-year-old woman with type 1 diabetes mellitus (T1DM) who underwent colposcopy with cervical biopsy and endocervical curettage for low-grade squamous intraepithelial lesion (LSIL) and chronic cervicitis 5 days earlier presented to the emergency department (ED) with right-sided neck and shoulder pain for a day's duration. She complained of the inability to rotate her neck as well as numbness and tingling of her right fourth and fifth fingers. Her vital signs were negative for fever and chills; her physical exam was only remarkable for tenderness of the right sternocleidomastoid muscle (SCM), with a limited range of motion of her neck and right shoulder. There were no visible skin changes such as localized erythema, swelling, or open wounds that could suggest infection. She denied any recent trauma, injury, or heavy lifting. She was diagnosed with torticollis and discharged from the ED with a nonsteroidal anti-inflammatory drug (NSAID), an opiate, and a spasmolytic, with instructions to return to the hospital for neck imaging if she experienced no improvement. Her next visit, 5 days later, was due to a lack of response and

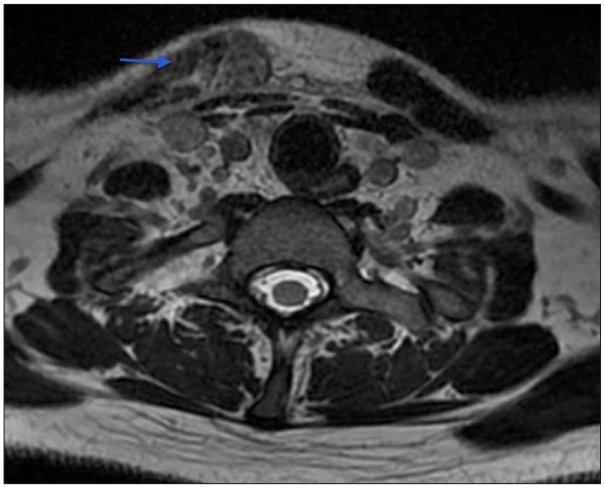

Figure 1. Cervical spine MRI without contrast reveals the edema and enhancement (arrow) of the right SCM compared with the left SCM; finding is consistent with inflammation.

progression of the pain; this time magnetic resonance imaging (MRI) of her soft tissues was notable for edema and inflammatory changes in the distal portion of her right SCM (Figure 1), and she was started on oral systemic steroids in addition to the previous regimen. Three days later, she presented to our hospital with complaints of fatigue and chills with spiking fever. She reported an unbearable right neck pain with the onset of right shoulder and chest pain for the past 2 days. Her vital signs revealed a fever of 39°C and tachycardia. On physical examination, she demonstrated significant pain upon very light palpation over the aforementioned areas with minimal skin erythema. A full body inspection was unremarkable for any open injuries/skin cuts. Electrocardiogram showed sinus tachycardia without evidence of ongoing ischemia. Her lab results were remarkable for leukocytosis (22.2 K/µl, 79% neutrophils), elevated erythrocyte sedimentation rate (112 mm/h), C-reactive protein (>19 mg/dl), and procalcitonin (0.58 ng/ml). At this point, necrotizing soft-tissue infection was suspected and she was started empirically on vancomycin, clindamycin, and piperacillin-tazobactam. An intravenous (IV) contrast-enhanced computed tomography (CT) scan of her chest and shoulder revealed focal swelling and fluid collection anterior to the sternoclavicular joint and surrounding soft tissues; she also had basilar consolidation of the right lung (Figures 2, 3).

The patient was promptly transported to the tertiary center for surgical debridement. During incision, a large abscess was discovered in the subcutaneous tissue over the right clavicle that was noted to extend deep into the pectoralis major and superiorly into the SCM. A portion of her right SCM and pectoralis major muscle were debrided. Luckily, the mediastinum, bones, and the joint spaces were spared.

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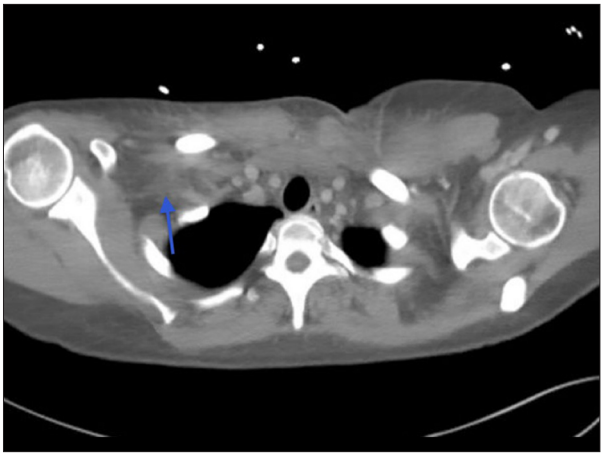

Figure 2. Shoulder CT with IV contrast reveals edema and fluid anterior to the right sternoclavicular joint with involvement of the right anterior thorax (arrow).

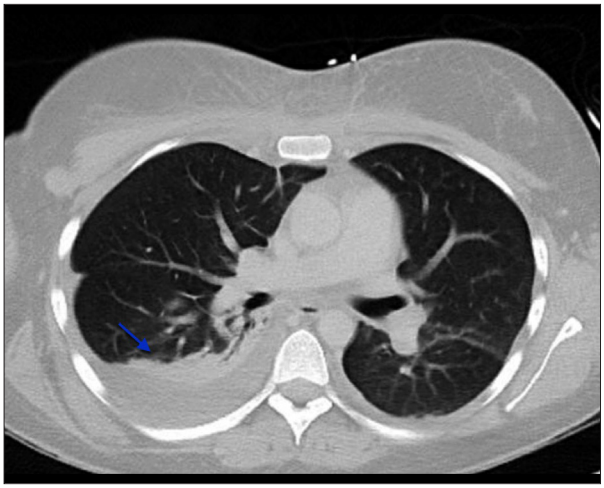

Figure 3. Chest CT with IV contrast reveals right basilar opacification (arrow).

Debrided soft tissue and blood cultures grew abundant *Streptococcus agalactiae*. The patient's vancomycin and piperacillin-tazobactam were changed to cefazolin and metronidazole. Once she became afebrile and leukocytosis resolved, she was discharged home with a 5-day prescription of amoxicillin-clavulanic acid and instructions for wound care. She was referred to an outpatient rehabilitation program.

In search of predisposing factors to NF caused by *S. agalactiae*, a review of her medical records was notable for cervical biopsy and endocervical curettage done 5 days before her first ED visit (which was perhaps not considered by the ED physician because of absence of fever/signs of infection). These procedures were performed because of findings of LSIL on her previous Pap smear. The biopsy showed koilocytotic changes consistent with human papillomavirus infection, squamous metaplasia, and chronic cervicitis. Microscopic examination of the endocervical specimen was remarkable for the presence of fragments of endocervical glands with inflammatory changes, blood, and mucus.

Discussion

The incidence of *S. agalactiae* associated with NF is increasing in nonpregnant adults [1,3,8,9]. This has been linked mostly with the increase in prevalence of chronic diseases, particularly diabetes and malignancy rather than increased virulence of *S. agalactiae* [9,11]. The lower extremities, trunk, and perianal region are commonly affected [1], whereas involvement of the neck has been rarely described.

In retrospective review of this case, the interrupted cervical mucosa from the patient's recent colposcopy with cervical biopsy and endocervical curettage likely served as a port of entry for *S. agalactiae*, which disseminated hematogenously. This is possible because *S. agalactiae* colonizes the vagina, rectum, perianal regions, and urethra [8], although swabs from these areas were not obtained from our patient. In addition, blood cultures were positive for *S. agalactiae*.

Streptococcus agalactiae has also been isolated from the skin [8] and has been implicated as the cause of NF of the foot via contiguous spread in a T1DM patient with a foot ulcer [9]. The same patient experienced NF of the contralateral foot within a week, due to hematogenous spread as the other foot had no ulcer; blood and tissue cultures for *S. agalactiae* were positive [9]. The hematogenous dissemination of *S. agalactiae* could possibly cause the time lag between first symptoms and presentation of NF in distant fascia and subcutaneous tissues [9].

NF of the lower anterior abdominal wall caused by *S. agalactiae* has also been described in a 50-year-old female 7 days after undergoing a total hysterectomy because of left ovarian cancer [10]. This was likely due to contiguous spread because her vagina, rectum, and ear were colonized by group B *Streptococcus* [10]. However, our patient had no visible open injury, sore, or ulcer on her upper body or extremities. This makes the hematogenous spread from the cervix a very likely route. Perhaps a penicillin prophylaxis given to immunocompromised women undergoing a genitourinary/gastrointestinal (GU/GI) procedure might prevent NF due to *S. agalactiae* [12].

The use of NSAIDs has been associated with severe cases of NF. Some reports suggest that, because NSAIDS mask the signs and symptoms of infection by downregulating the host immune response, NSAID use could confound early recognition of the disease, delaying appropriate treatment and accelerating the course of infection, leading to an increased mortality

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rate [13–15]. Although retrospective studies have demonstrated the impact of NSAIDs on NF prognosis, prospective studies are yet to support the association between NSAID use and NF prognosis [15]. However, at the time of her first and second presentation, the patient did not have fever and chills, which are indicative of an infection and would have precluded the prescription of NSAIDs and corticosteroids. The reason behind the initial absence of fever and chills could be that she is immunocompromised because of T1DM.

Conclusions

NF is a severe soft-tissue infection that requires early diagnosis and management via resuscitation, urgent surgical debridement, and IV antibiotics to minimize tissue loss and prevent life-threatening complications. This case emphasizes the growing incidence of NF caused by *S. agalactiae*, particularly in immunocompromised patients. A high index of clinical suspicion is required for early diagnosis and treatment of NF, especially in immunocompromised patients who underwent a recent GU/GI procedure. It also highlights the need for certainty in diagnosis before the prescription of NSAIDs and corticosteroids to avoid masking clinical presentation, which could delay the detection of NF.

Conflict of interest

None.

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