






# Cellulitis-Abscess Developing Secondary to Trauma

## Travmaya Bağlı Olarak Gelişen Sellülit-Apse

 Fadime Korkmaz<sup>1</sup>,  Harun Ak<sup>1</sup>,  Mustafa Genceli<sup>1</sup>,  Ozge Metin Akcan<sup>1</sup>,  Ulku Kerimoglu<sup>2</sup>

### ÖZET

Sellülit, derin dermis ve deri altı yağ dokusunu içeren derinin akut bir enfeksiyonudur. Klinik belirtiler; kızarıklık, şişlik, sıcaklık ve hassasiyet gibi enfeksiyonun görüldüğü bölgede ortaya çıkar. Sellülit tedavi edilmezse ciddi komplikasyonlar, nekroz, apse ve osteomyelite yol açabilir. Streptococcus pyogenes ve Staphylococcus aureus (S. Aureus) en sık izole edilen bakteriler arasındadır. Bu bakteriler genellikle deri bütünlüğünün bozulduğu yerlerden dokuya ulaşmaktadır. Hastalarda nadir durumlarda selülit çevre dokulara yayılabilir, apse oluşumunu veya osteomyeliti tetikleyebilir. Bu yazımızda travmaya sekonder sol tibia ön yüzde selülit olarak başlayan, giderek ilerleyerek apse ve çevre dokuda nekroz gelişimine sebep olan sellülit-apse vakası sunulmuştur. Bilinen hastalığı olmayan 17 yaşında erkek hasta, 10 gün önce merdivenden düşme sonrası sol bacak ön yüzde başlayan şişlik ve kızarıklık şikayeti ile başvurdu ve sellülit tanısı aldı. İzlemede nekrotik yumuşak doku enfeksiyonu gelişti ve yara kültüründe S. aureus üremesi oldu. Olgumuz komplikasyonsuz şekilde başarıyla tedavi edildi. Cilt ve yumuşak doku enfeksiyonlarını tedavi etmek için genellikle birinci kuşak sefalosporinler ve antistafilokokal penisilinler ilk tercihlerdir. Ancak, metisilin dirençli S. aureus (MRSA) tarafından oluşturulan enfeksiyonları etkin bir şekilde kontrol etmeyebilirler. Antibiyotik seçimi önemli olsa da, enfekte yabancı cisimlerin çıkarılması, apse varsa cerrahi olarak drenajı ve düzenli yara temizliğinin sağlanması gibi destekleyici önlemler başarılı bir iyileşme için hayati öneme sahiptir. Sonuç olarak, cilt ve yumuşak doku enfeksiyonlarını yönetmede klinik değerlendirme çok önemlidir. Çünkü laboratuvar sonuçları hastanın durumunu tam olarak yansıtmayabilir. Ampirik antibiyotik tedavisi; lezyonun şiddeti, klinik durum ve muhtemel patojenler göz önünde bulundurularak derhal başlatılmalıdır. Etkilenen bölgeden kültür almak, etkeni tanımlamada ve antibiyotik direnç paternlerini belirlemede yardımcı olur ve buna göre tedavi planını yönlendirir.

**Anahtar Kelimeler:** Travma, selülit, apse, staphylococcus aureus

### ABSTRACT

Cellulitis is an acute bacterial infection of the skin's deeper layers. Clinical indicators such as redness, swelling, warmth, and tenderness manifest at the site of infection. If left untreated, cellulitis can lead to serious complications, necrosis, abscess, and osteomyelitis. The most frequently isolated bacteria are Streptococcus pyogenes and Staphylococcus aureus (S. aureus). These bacteria species often exploit breaches in the skin's integrity to gain entry to tissue. In rare cases, cellulitis may extend to contiguous tissues, precipitating abscess formation or osteomyelitis. We present a case of cellulitis on the anterior left tibia, resulting from trauma, which progressed to abscess formation and surrounding tissue necrosis. A 17-year-old male with no prior medical history presented with swelling and redness 10 days after sustaining a fall down stairs. Despite initial cellulitis diagnosis, the infection worsened, yielding Staphylococcus aureus growth in wound culture and necessitating treatment for necrotic soft tissue infection. Our case was successfully treated without any complications. First-generation cephalosporins and antistaphylococcal penicillins are commonly the initial choices for treating skin and soft tissue infections. However, they may not effectively combat infections caused by methicillin-resistant S.aureus (MRSA). While antibiotic selection is paramount, supportive measures such as removing infected foreign bodies, surgically draining lesions like abscesses, and ensuring regular wound cleansing are crucial for achieving successful recovery. In conclusion, clinical evaluation remains crucial in managing skin and soft tissue infections because laboratory results may not fully reflect the patient's condition. Empirical antibiotic therapy should be initiated immediately, taking into account the severity of the lesion, clinical condition, and likely pathogens. Obtaining cultures from the affected area helps identify the pathogen and determine antibiotic resistance patterns, guiding the treatment plan accordingly.

**Key words:** Trauma, cellulitis, abscess, staphylococcus aureus

<sup>1</sup>Necmettin Erbakan University, Faculty of Medicine, Departments of Pediatrics, Konya, Türkiye

<sup>2</sup>Necmettin Erbakan University, Meram Faculty of Medicine, Departments of Radiology, Konya, Türkiye

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### Sorumlu Yazar/Corresponding Author:

Fadime Korkmaz,

Necmettin Erbakan University, Faculty of Medicine, Departments of Pediatrics, Konya, Türkiye

**e mail:** fadimekorkmaz1641@gmail.com

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## INTRODUCTION

Cellulitis, a bacterial infection deeply rooted within the skin layers, affects both the dermis and subcutaneous fat tissue. Clinical indicators such as redness, swelling, warmth, and tenderness manifest at the site of infection (1). If left untreated, cellulitis can lead to serious complications, necrosis, abscess, and osteomyelitis (2). The most frequently isolated bacteria are *Streptococcus pyogenes* and *Staphylococcus aureus* (*S. aureus*) (3). These bacteria species often exploit breaches in the skin's integrity to gain entry to tissue. In rare cases, cellulitis may extend to contiguous tissues, precipitating abscess formation or osteomyelitis (4). This paper presents a case of cellulitis wherein trauma served as a catalyst for cellulitis onset and subsequent progression resulted in abscess formation and tissue necrosis on the anterior aspect of the left tibia.

## CASE REPORT

A 17-year-old adolescent male, with no reported medical history, presented to the hospital about 10 days after sustaining a fall down stairs. Initial evaluation at an external facility revealed notable swelling and erythema on the anterior surface of his left leg (Figure 1a). One week post-injury, the patient returned to the external facility with a malodorous, purulent open wound. The abscess was drained, and a sample was obtained for culture analysis. Treatment with intramuscular cefazolin and oral ciprofloxacin was initiated, and outpatient follow-up was arranged.

On the third day of treatment, the patient presented to our facility. Physical examination revealed a 3x3 cm necrotic open wound on the anterior left tibia, surrounded by erythema, warmth, and malodorous purulent discharge (Figure 1b). Laboratory tests showed a white blood cell count of  $10.250/\text{mm}^3$ , with neutrophils at  $6.090/\text{mm}^3$  and lymphocytes at  $3.310/\text{mm}^3$ . The erythrocyte sedimentation rate was recorded at 19 mg/hour, and the C-reactive protein level was 22.9 mg/L.



**Figure 1.** a) Image of cellulitis on the anterior surface of the tibia. b) Purulent necrotic tissue at the wound site. c) Healed appearance of the wound after treatment.



**Figure 2.** a) Coronal T1-weighted contrast-enhanced image showing fistulization of the abscess with secondary ulceration and defect in the skin. b) Coronal T1-weighted contrast-enhanced image demonstrating loculated fluid collection in the subcutaneous tissue consistent with an abscess. c) Axial T1-weighted image revealing a thick-walled and septated abscess located in the anterior surface of the tibia.

Results from the abscess culture previously sent to the external center revealed growth of methicillin-sensitive *S. Aureus* (MSSA). Contrast-enhanced magnetic resonance imaging (MRI) was conducted for osteomyelitis assessment, revealing a 4 cm ulceration on the skin, a 3x2 cm abscess with fissuring on the skin and cellulitis in the surrounding area (Figure 2). The patient was admitted, and wound debridement was performed to remove necrotic tissues. In consideration of the antibiogram obtained from the external center culture and to ensure broad-spectrum coverage, intravenous ceftriaxone were administered. Due to the lack of improvement in the patient's clinical condition within 48 hours, clindamycin was empirically added to the treatment to cover potential pathogens. The cultures obtained at our hospital yielded no growth.

After 10 days of intravenous ceftriaxone and 8 days of intravenous clindamycin, the wound showed signs of healing and acute-phase reactants had decreased. After being discharged with amoxicillin-clavulanic acid, the patient used amoxicillin-clavulanic acid for 7 days. No complications were

observed during follow-up (Figure 1c).

## DISCUSSION

Bacterial skin and soft tissue infections remain a notable concern in pediatric populations, presenting a persistent health challenge. *S.aureus* stands out as the primary culprit in over 70% of cases, maintaining its status as one of the most prevalent pathogens causing human disease despite advancements in antibiotic therapy and hygiene practices. Timely diagnosis and prompt initiation of appropriate treatment are imperative, as delayed recognition or inadequate therapy can precipitate severe complications (5,6). The culture from our patient's abscess also indicated the presence of MSSA. Given the patient's prior good health and lack of hospital exposure, suspicion arose regarding community-acquired MSSA (CA-MSSA). Notwithstanding the trauma-associated MSSA infection in our patient, the development of a necrotic soft tissue infection occurred. Even among immunocompetent individuals, it is essential to closely monitor trauma-related infections and take measures to prevent potential complications.

The treatment approach for bacterial skin and soft tissue infections in children varies depending on the severity of the lesions and the child's clinical status. For those with mild to moderately severe infections not necessitating hospitalization or urgent surgical intervention, timely initiation of oral antimicrobial therapy can prevent disease progression and potential hospital admission. Antimicrobial therapy should be chosen empirically to target the most likely pathogens, considering factors such as the resistance profile of the pathogen, antibacterial spectrum and activity of the chosen agent, and pharmacokinetic properties (5,6). Despite the initial plan for outpatient management with oral ciprofloxacin and intramuscular cefazolin, our patient presented with worsening symptoms, including deepening wound, purulent discharge, and necrotic tissue formation around the wound. Given the clinical deterioration despite ongoing treatment, a decision was made to proceed with inpatient care and follow-up. In cases involving necrotic soft tissue infections, appropriate broad-spectrum antibiotic therapy, meticulous local wound management, and debridement are pivotal (7). Our patient underwent prompt debridement, received suitable parenteral antibiotic therapy, and received comprehensive local wound care.

First-generation cephalosporins and antistaphylococcal penicillins are commonly the initial choices for treating skin and soft tissue infections. However, they may not effectively combat infections caused by methicillin-resistant *S.aureus* (MRSA). While antibiotic selection is paramount, supportive measures such as removing infected foreign bodies, surgically draining lesions like abscesses, and ensuring regular wound

cleansing are crucial for achieving successful recovery (5,8). Our patient was managed successfully following these therapeutic principles.

In conclusion, clinical judgment remains crucial in managing skin and soft tissue infections, as laboratory results may not fully reflect the patient's condition. Empiric antibiotic therapy should be initiated promptly, considering lesion severity, clinical presentation, and likely pathogens. Sampling for culture from the affected area aids in identifying the causative agent and determining antibiotic resistance patterns, guiding treatment adjustments accordingly. Vigilant monitoring, especially in trauma-related infections where skin integrity is compromised, is of paramount importance. Urgent debridement is warranted in cases of necrotizing soft tissue infections, accompanied by timely administration of appropriate antibiotic therapy.

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**Sorumlu Yazar:** Fadime Korkmaz, Necmettin Erbakan University, Meram Faculty of Medicine, Departments of Pediatrics, Konya, Türkiye

**e-mail:** fadimekorkmaz1641@gmail.com

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