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**Case Report**

# SEVERE STREPTOCOCCUS PYOGENES SURGICAL SITE INFECTION AFTER INGUINAL LIPOMA REMOVAL

*Beatrice D'Orazio [1,2], Giuseppe Damiano [1], Attilio Ignazio Lo Monte [1], Gaetano Di Vita [1], Girolamo Geraci [1]*

*1. Department of Surgical, Oncological and Stomatological Sciences, University of Palermo, Palermo, Italy*
*2. Postgraduate Medical School in General Surgery, University of Palermo, Palermo, Italy*

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**ABSTRACT**

Surgical site infections (SSI) are a common cause of health care-associated infections. They are localized in the surgical incision site and can lead to deep tissues spreading. Among the wide spectrum of SSIs , we will consider specifically group A streptococcus cellulitis. This kind of infection can have a negative evolution and result in necrotizing fasciitis (NF), previously known as streptococcal gangrene. The term NF indicates a rare necrotizing infection involving any of the soft tissue layers that still have a high mortality rate from 7% to 76%. An early diagnosis and urgent treatment are key to ensuring the safety of the patients' life. A 64-year-old man underwent a complete surgical removal of an inguinal lipoma. A few hours after the procedure, he developed initial signs of streptococcal cellulitis. Thanks to an early diagnosis, a multidisciplinary management was established and after 20 days the patient was discharged from our department in good, general clinical conditions. Our experience has shown how good clinical control and the early evaluation of any clinical warning signs beginning in the very first few hours after the surgical procedure are important in order to prevent clinical and local conditions from worsening. Moreover, we underline the great utility of a combined management led by a multidisciplinary team based on antimicrobial therapy, hyperbaric oxygen therapy and surgical approach that could be the key to ensure safety of the patients' life.



## 1. Introduction

Surgical site infections (SSI) are a common cause of health care-associated infections. They are localized in the surgical incision site and can lead to deep tissues spreading. They usually occur within 72hrs after the surgical procedure and account for 38% of nosocomial infections (1). Moreover, we must underline that SSIs are a more common source of fever and inappropriate pain within 48 hours after the procedure. If this symptom occurs, an immediate clinical re-evaluation of the patient is mandatory (2).

Streptococcus Pyogenes (SP) is one of the most common human pathogens, it can cause extensive infection of the tegument and the gateway may include surgical incision. Unless appropriate intervention is undertaken there is likely to be a rapid negative evolution (3).

Infection of the integument caused by β-hemolytic streptococci include a wide spectrum of disease going from the mild form of erysipelas or cellulitis to the life-threatening form of necrotizing fasciitis and streptococcal toxic shock syndrome (3).

Cellulitis caused by this pathogen is defined as any spreading infection involving the dermis and subcutaneous tissues. Furthermore, purulent cellulitis is defined as cellulitis with associated purulent drainage or exudate in the absence of a drainable abscess; this is a common form of skin and soft tissue infection resulting in more than 600,000 hospitalizations per year (4).

Due to this pathogen, necrotizing fasciitis (NF) has been well-known for years but over the past decade we have contributed to a dramatic increase in the reporting of such infections (4).

NF still has a high mortality rate (7% to 76%) (5). This high rate is closely linked to the earliness of diagnosis since even previously healthy patients could be affected by it. Therefore, an early diagnosis and urgent treatment are key to ensure the safety of the patients' life (6, 7).

Group A streptococcus (GAS) infection is defined as an illness accompanied by the isolation of GAS from a normally sterile site or from a surgical incision in a patient for whom the indication for surgery was not an existing GAS infection (8).

Corresponding author: Girolamo Geraci, *girolamo.geraci@unipa.it*
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Furthermore, we need to underline that the early differential diagnosis from other soft tissues infections can be very difficult due to unspecific symptoms and that it becomes clear, most of the time, in the late stages, when systemic symptoms have already appeared (3).

## 2. Case report

A 64-year old man, with only hypertension, came to our division for a swelling lesion of the right inguinal region. After some pre-operative evaluation including ultrasound, blood tests and anaesthetic evaluation, he underwent a complete surgical removal of the lesion under local anesthesia, which resulted as a lipoma of the inguinal region.

A few hours after the surgical procedure, the patient complained of inappropriate pain at the minor surgical incision site for which we did not discharge him the same day of the procedure as we usually do for this kind of surgery.

24 hours after the procedure we noticed a warmth, moderate oedema and erythema of the surgical wound along with fever (38°C), blood leukocytosis and tachycardia (Table 1 and Figure 1 - A-C-D).

| | 1st POD | 2nd POD | 4th POD | 10th POD |
|---|---|---|---|---|
| WBC | 24.14 $10^3$/ul | 22.8 $10^3$/ul | 13.47 $10^3$/ul | 7.35 $10^3$/ul |
| NEUTR | 21.47 $10^3$/ul | 19.68 $10^3$/ul | 12.4 $10^3$/ul | 5.24 $10^3$/ul |
| HGB | 15.8 g/dl | 14.4 g/dl | 13.5 g/dl | 13.8 g/dl |
| HCT | 44.6% | 41.5% | 38.5% | 40.6% |
| PLT | 187 $10^3$/ul | 153 $10^3$/ul | 161 $10^3$/ul | 319 $10^3$/ul |
| CK | 33 U/L | 33 U/L | 33 U/L | 33 U/L |
| AST | 10 U/L | 10 U/L | 27 U/L | 18 U/L |
| Blood pressure | 130/80 mmHg | 140/85 mmHg | 115/80 mmHg | 130/80mmHg |
| Body temperature | 38°C | 39.4°C | 37.6°C | 36.8°C |
| Heart ratio | 100 bpm | 96 bpm | 72 bpm | 70 bpm |

**Table 1. Patient parameters during the hospital stay.**


**Figure 1. A-D oedema and erythema of the surgical wound and the district after debridement.**

48 hrs after the procedure the clinical conditions appeared have worsened with increased swelling, oedema and erythema along with signs of infection in the blood and crepitus appeared in the surgical site (Table 1 and Figure 1, B).

An empirical antibiotic therapy was established where we administrated 2gr of Cefazolin every 12 hours, 1 gr of Amikacin every 24 hours and 600 mg of Clindamycin every 6 hours; CT scan showed signs of cellulitis of soft tissue located in the surgical site (Figure 2) and the patient underwent a surgical procedure in order to proceed to a debridement and cleaning of the wound (Figure 2) and culture samples were taken from which SP was isolated. During the surgical procedure we didn't observe any fascial plane involvement, confirming the infection was limited to the dermal plane. Moreover cultures from the blood were performed and no bacterial growth was noticed.

**Figure 2. CT scan showing streptococcal cellulitis in the right inguinal region with gas bullas in the soft tissue at the surgical incision site.**

Thanks to a multidisciplinary team (surgeons, infectious disease specialists, anaesthesiologists) a specific antimicrobial therapy was established, based on the results of the microbiological examination and susceptibility testing, along with a combined surgical and hyperbaric oxygen therapy. This management has led to a resolution of the alteration of clinical and laboratory parameters by 10 POD (Table 1).

We administrated 600 mg of Clindamycin every 6 hours plus 1 gr of Vancomycin every 12 hours for 10 days.

Repeated surgical cleaning sessions of the wound were performed along with 9 hyperbaric oxygen therapy sessions.

The patient did not show any hemodynamic instability for the duration of the hospital stay; diuresis and blood pressure remained stable.

After 20 days the patient was discharged in good, general clinical conditions from our institutions (Table 1).

We discharged the patient with an antimicrobial therapy to follow at home: 2 gr of cefazolin every 8 hours for 10 days. We also scheduled regular controls in our division each week for 1 month, after which we reached full recovery, also of the wound.

## 3. Discussion

SP can be responsible for very aggressive infections, even in previously healthy patients (6), caused by any conditions compromising tegument integrity (9). GAS inhabits patients and normal carriers in whom the organism resides on the skin and mucous membranes; because humans are the only reservoir, they can be sources of infections (8).

This could be a risk for any surgery, even minor surgery and surgical procedures at a clean surgical site, as in our experience; minor surgery could be at risk because usually operations are executed as outpatient procedures and perhaps there could be a lack of sterility (10). Furthermore, there is very little literature about GAS infections in clean surgical sites or occurring in cases of minor surgery, and all the references on this topic we were able to find were few case reports (5-8, 11).

The early differential diagnosis from other soft tissue infections can be very difficult due to unspecific symptoms and that it becomes clear, most of the time, in the late stages, when systemic symptoms have already appeared (3). Moreover, diagnosis is still difficult and uniquely based on clinical data (9). Any clinical sign of surgical site infection such as swelling, erythema, oedema, warmth, crepitus of the wound, and inappropriate pain, should be rapidly taken into consideration in order to reach a correct diagnosis in the early stage before systemic signs and symptoms that lead to a negative evolution appear (8).

Antibiotic therapy is still one of the main treatments, but it results insufficiently if used alone (7); usually, early surgical management is the best first line approach, above all in the uncertain cases (11).

Thus far, we can state that higher sterility control during any surgical procedure should be mandatory to prevent GAS surgical site infections, but an early and precise diagnosis is the only way to end with a good clinical outcome and increased survival rates (9).

Monobacterial GAS infections of the surgical site can occur in patients, who haven't undergone any previous alteration of the immune system, even if undergoing minor and clean surgery, so that a high index of clinical suspicion along with a low threshold for surgical intervention and early debridement is necessary to prevent compromise of the general condition and minimize tissue and function loss (12).

In light of our experience, we consider a persistent clinical control useful beginning in the very early hours after the procedure in order to appreciate any sign of initial infection of the surgical site; as a result, we must stress the importance of early diagnosis to ensure higher rate of survival in severe SSI's.

## 4. Conclusions

We must point out that, as in this case, report of the warning signs leading to a longer hospital stay due to the inappropriate pain at the surgical incision site is what allowed us to reach a very early diagnosis and urgent treatment of the resulting cellulitis, preventing the negative evolution to the feared NF.

Our experience has shown how good clinical control from the very few hours after the surgical procedure and the early evaluation of any clinical warning signs are important in order to prevent the worsening of the clinical and local conditions. Moreover, we underline the great utility of a combined management led by a multidisciplinary team based on antimicrobial therapy, hyperbaric oxygen therapy and a surgical approach that could be key to ensure the patients' life.

In addition, we must suggest that the persistent clinical control of the patient and his wound should continue after the discharging at home, firstly, to ensure good health education of the patient about the warning clinical signs for an SSI in the case of a minor and clean surgery, be made mandatory at the moment of discharge, along with a precise explanation of the hygienic wound management at home.

We also consider that an ongoing collaboration and communication between the surgical group and general physician, who is in charge of the patient after discharge from the surgical division, should be considered as a highly important part of the process. These suggestions can lead to an early diagnosis of any SSI in order to minimize costs related to the hospital stay and management and to prevent the negative evolution of these severe infections even after minor and clean surgical procedures.

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