COMPLICATIONS WITH A BITE WOUND IN AN IMMUNOCOMPROMISING PATIENT CAUSED BY A STREET CAT - CASE REPORT

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Abstract: Cat bites and scratches can lead to more serious infections, where they lead to a disruption of the integrity of the epithelial part of the skin, which can affect the subcutaneous tissue, tendons, muscles, blood vessels and nerves, etc. A case of a cat bite on the lower leg of a patient with chronic diabetes mellitus and a detailed complicated course of treatment is described. Immunocompromised patients are at high risk of health complications from cat bites, and it is very important that if a cat bite occurs, the patient promptly reports to an adequate medical institution, in order to repair the newly formed injury/wound in a timely manner. If the wound is ignored, complications with unpredictable consequences often occur.
Keywords: Diabetes, vulnus morsum, infection, necrosis, cat

1. INTRODUCTION

Domestic cats (Felis silvestris catus) pose a potential threat, as they are natural predators with an instinct to protect their territory and nests, and therefore it is not surprising that they can injure people using their canines and/or claws. They show their aggression towards humans by scratching or biting, which damages tissue and causes wounds. In addition, they are potential vectors of zoonoses (Ganière, 2019; Katica, 2022).

According to statistics, animal bites account for 1% of emergency department visits each year, and cat bites account for approximately 5%-20% (Ganière, 2019). Since these are small puncture wounds, many patients try to avoid going to the emergency room (Maniscalco, 2023).

A bite wound (Vulnus morsum) can refer to simple damage to the integrity of the epithelial part of the skin or to deep damage to subcutaneous tissue such as tendons, muscles, blood vessels and nerves, parenchymal organs and even bones (Alonso, 1996).

Cat bites can lead to more serious infections. A study by Talan et al showed that 75% of cat bite wound cultures grew Pasteurella multocida, the most common species isolated from the cat's oropharynx. Other studies have shown that cat bites can be infected with aerobic bacteria such as Streptococcus, Staphylococcus, Moraxella and Neisseria, or Fusobacterium, Bacteroidetes, Porphyromonas and Prevotella (Maniscalco, 2023; Talan, 1999; Sadhwani, 2024). Isolation of the causative agent and the use of appropriate antimicrobial therapy are of great importance, which is essential for reducing infection. In addition to the above, bites can also cause local infections such as cellulitis, abscess formation and tenosynovitis. If the wound is not treated properly, local infection can lead to more serious systemic manifestations such as bacteremia, osteomyelitis, meningitis and endocarditis (Talan, 1999; Sadhwani, 2024; Brook, 2009).

Today, skin wound therapies are categorized as conventional or regenerative. Conventional skin wound treatment involves debridement of necrotic tissue, which consists of the topical application of various types of wound dressings to ensure adequate tissue perfusion, limit pressure in the wound, and reduce infection. Regenerative skin wound therapy is a novel and rapidly developing field of biomedical research that aims to promote wound healing and the regeneration of damaged cells and diseased skin tissue without scarring (Singer, 1999).

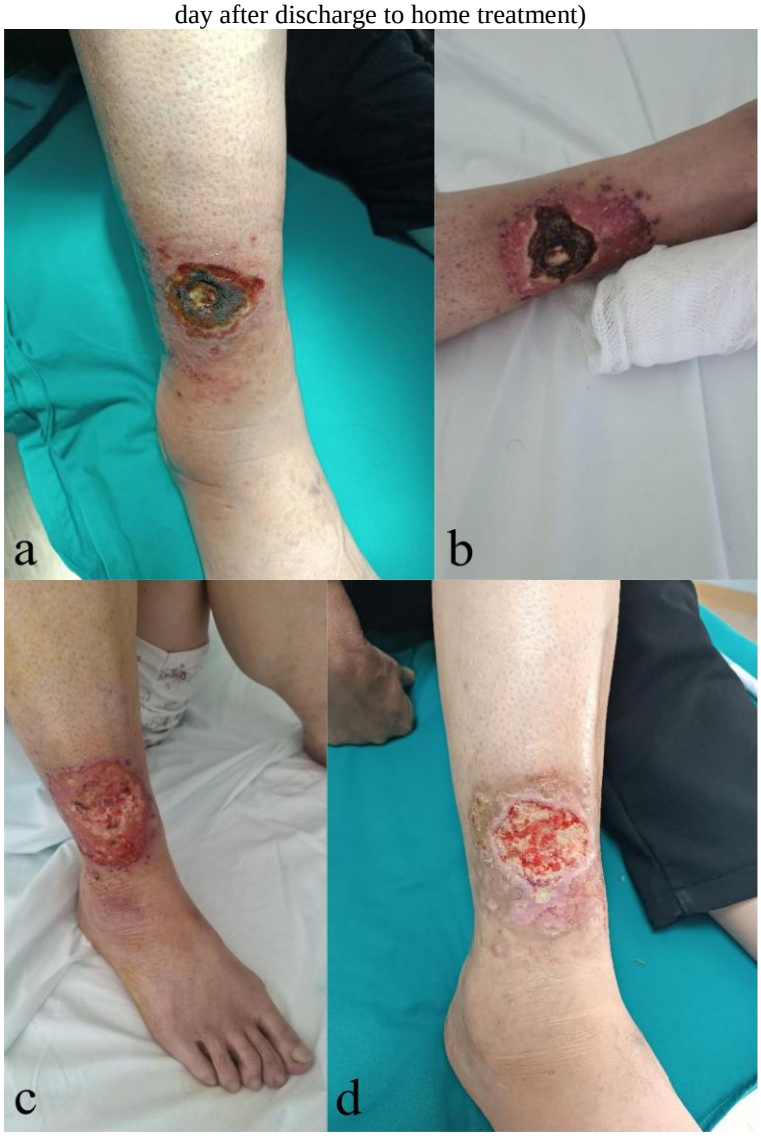
I present a complicated case of a bite wound in a patient with chronic diabetes mellitus, caused by an alley cat. The purpose of this case report is to demonstrate that cat bites or scratches should not be ignored, especially if the bite victim is an immunocompromised individual.

2. CASE REPORT

A 62-year-old female patient presented to the emergency department (ED) due to a bite wound on her left lower leg, which she had received from a stray cat. According to the anamnestic data, initially after the bite, there was no wound but only a barely visible impression of the teeth marks. However, a clinical examination revealed a visible bite wound with a diameter of about 5 cm, which affected the skin and subcutaneous tissue. The wound was primarily treated and washed. The patient was prescribed the antibiotic Esbesul tablets 480 mg, dosage: 2x2 per os. After the therapy and daily dressing by the competent health center (DZ), there was no improvement and another antibiotic was prescribed (Doxycycline capsules 100 mg, dosage: 1x1 per os). After 13 days, the patient returned for an examination at the ED, and then to the Emergency Medicine Clinic (KUM) because she started to have a fever. She had previously been diabetic and on oral therapy. Clinically, in the area of the anterior aspect of the lower third of the right lower leg, there was a skin change of 5cm in diameter, ulcer-like with surrounding erythema, with palpatory pain, with signs of necrosis. A new therapy was prescribed, Duoclav tablets (875+125) mg, dosage: 2x1 and Metrozol tablets 500 mg, dosage: 3x1 per person. The clinical status was dominated by central necrosis, the surrounding skin was red, swollen, painful to the touch with pustular changes (Figure 1a).

Laboratory tests were performed: L = 9.9 x109 /L, without C-reactive protein and wound swab.

Figure 1. (a- 26th day after the cat bite; b- evident signs of necrosis; c- immediately after the necrectomy; d- 24th day after discharge to home treatment)



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On the twenty-sixth day after the injury, the patient was hospitalized (Figure 1a). Upon admission, only a swab of the throat and nose is performed, as well as laboratory findings (L = 8.4 x109 /L, C-reactive protein 8.6 mg/L and swab of the throat and nose which is normal). The condition of the wound worsens and on the fourth day after hospitalization, a larger zone of skin necrosis (and deeper structures) is observed, with a central ulcer formation (Figure 1b). Duoclav tablets (875+125) mg are prescribed, dosage: 2x1; Metrozol injection 500 mg, dosage: 3x1 I.V., and Clexan 40 mg s.c. x1. A daily pass is also included.
Standard preoperative preparations followed, and a necrectomy was performed under general anesthesia (Figure 1c). Postoperative laboratory findings (L = 6.8 x109 /L, without C-reactive protein 2.3 mg/L).
The patient was discharged on the third postoperative day for home treatment, with the continuation of prescribed Th Duoclav tablets (875+125) mg, dosage: 2x1, daily dressing by the outpatient service.
Three weeks postoperatively, the local findings worsen again, with signs of wound inflammation, and a wound swab is taken (Figure 1d), with daily dressings. The swab of the wound was neat, the wound was improving locally, where the toilet was continued every other day.

3. DISCUSSION

Research shows that animal bites are most common in the lower extremities (Obradović, 2011; Khazaei, 2014), and represent a major public health problem worldwide as well as a major challenge due to potentially serious health consequences, disease complications, and systemic problems, such as infections, allergies, and/or anaphylactic shock (Ming-Hau, 2012).
Additional complications after bite wounds can be expected in immunocompromised patients, people with chronic diseases, and people with diabetes are particularly at risk of developing infections. Patients with diabetes are prone to infections due to pre-existing neuropathy, vascular insufficiency and neutrophil dysfunction. The most important risk factor is peripheral neuropathy, which is present in 30% to 50% of patients with diabetes. The foot becomes sensitive to trauma as a result of sensory, motor and autonomic dysfunction, excessive pressure occurs in the deformed foot and ischemia develops. In addition, additional risk factors such as atherosclerotic occlusion, smoking and obesity complicate treatment (Lučkin, 2023).
If the cat was not under veterinary supervision, an infection of the wound could be expected. This actually happened in our case, because it was a street cat. Cats have many opportunistic and/or potentially pathogenic bacteria in their oral cavity that cause infections from bite and scratch wounds (Katica, 2022; Razali 2020). The most common causes of bite wound infection are the aerobic and anaerobic oral flora of the attacker and the aerobic skin flora of the victim (Presutti, 2001). The bacteria most often found in the wound are: Pasteurella multocida, Pseudomonas, Capnocytophaga canimorsus, Staphylococcus aureus, Staphylococcus epidermidis (Katica, 2019; Brooks, 2004). These are mostly mixed infections of aerobes and anaerobes. One study noted that anaerobes and aerobes were isolated together in 56% of wounds, aerobes alone in 36%, anaerobes alone in 1%, and no bacteria were isolated in 7% of infected wounds (Talan, 1999).
This type of bite also requires a rabies risk assessment During the treatment of the patient, anti-rabies protection was abandoned since reports from the Cantonal Public Health of the Sarajevo Canton did not register a single sub-suspicious case over a long period of time, while in some countries, such a bite requires the inclusion of anti-rabies protection. It is necessary to identify the animal that caused the injury as well as its owner and check whether the animal is regularly vaccinated. In our case, the cat that caused the wound and then the persistent infection in the patient was a stray cat from the city neighborhood where the patient lives. Of course, the cat had never been vaccinated, but the possibility of rabies was ruled out, since the cat was still living on the streets of the aforementioned city district and was under observation by local veterinary doctors. The cat's clinical picture did not indicate any suspicion of potential rabies. Ultimately, the following measures were taken: curative measures listed in the “case report” section, which resulted in the resolution of necrotic processes and successful wound healing.

4. CONCLUSION

Animal bite wounds, including cat bites, can lead to serious complications and therefore represent a significant public health problem. Immunocompromised patients are at particularly high risk of health complications from cat bites, and it is very important to educate them and refer them to an appropriate health facility in a timely manner, so that the newly created injury/wound can be repaired in a timely manner. Otherwise, an apparently innocuous wound and/or scratch, if ignored, often leads to serious complications that manifest themselves as stubborn infections, which is especially pronounced in patients suffering from diabetes, with unforeseeable consequences.

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