Extensive facial trauma caused by dog bites in woman suffering from systemic fluconazole-resistant Candida infection

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SUMMARY: Extensive facial trauma caused by dog bites in woman suffering from systemic fluconazole-resistant Candida infection.

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Introduction. Dog bites present a complex problem. Extensive facial trauma is a challenging problem to treat with priority for functional outcome. This paper describes the conservative treatment in a very difficult case of facial trauma with unusual infections due to the bites.

Case report. A 45 year-old woman was admitted in hypovolaemic shock with amputation of nose, upper and lower lips, left cheek and chin caused by dog bites. After vital parameters and volemia were stabilized, wound toilet was performed, followed by skin and mucosal rotation flaps and anterior nasal tamponade; the lesion has then been covered with a collagen/oxidized regenerated cellulose dressing and sterile gauzes. Culture test highlighted coagulase-negative Staphylococcus and Candida albicans. However after few days, the patient developed septic-undulant hyperpyrexia, retinitis, renal candidiasis, folliculitis. Systemic Candida infection resistant to fluconazole was diagnosed. Amphotericin B was given to the patient and the facial wound was managed conservatively with an active medication because of inoperability conditions. The outcome of the use of active medications was an immediate response with excessive granulation tissue followed by a rapid re-epithelization.

Conclusion. As our case has shown, conservative treatment can be a valid alternative therapy in the treatment of large wounds with invasive candidosis and candidaemia or other major contraindications to surgery. In fact, in cases where surgical reconstruction is not a feasible option, conservative treatment can allow a rapid repair of the skin barrier.

KEY WORDS: Dog bite - Face amputation - Systemic Candida infection.

Introduction

Dog bites to the face can cause severe soft tissue damage or amputation and may be life-threatening when major infection occurs. Traditional treatment consists of wound toilet and debridement; surgical repair is only considered when the possibility of infection has been ruled...
out. Surgical opinion is gradually shifting towards ear-
lier repair (1). Immediate reconstruction of these inju-
ries is frequently performed using local flaps and adja-
cent tissue transfer to close the defect, but these repairs
frequently involve a permanent distortion of the local an-
tomy (2). In 2007, Dubernard et al reported the outcomes
of partial face transplantation in a disfigured woman for
whom conventional reconstruction was considered a poor
option (3).

We report the case of a woman who was disfigured
by several dog bites, that differ from the French case as
she presented peculiar general conditions.

Case report

A 45 year-old woman was admitted to our Emergency Depart-
ment with complete amputation of her distal nose, upper and lower
lips, adjacent part of the left cheek, and chin caused by dog bites (Fig.
1). She had taken an excessive amount of antidepressants, benzo-
diazepines and alcohol, which resulted in vomiting and loss of con-
sciousness. Her dog, that started licking her face to protect her from
the vomit, ended up consuming the mixture and slowly began to de-
vour her face.

The patient was admitted to the hospital in a state of hypovo-
laemic shock due to acute hemorrhage. On examination, she presented
with altered mental status, blurred vision and sleepiness, tachycar-
dia and tachypnoea, hypotension and oliguria.

The first intervention was to stabilize the vital parameters and to
restore the blood volume. Afterwards, wound toilet and debridement
as well as cutaneous and mucosal flaps and anterior nasal tampona-
de were performed; finally, the wound was medicated with a colli-
gen/oxidized regenerated cellulose dressing (Promogran prisma®)
and sterile gauzes. Before giving her antibiotics (Metronidazole and Amoxi-
cillin-Clavulanate), a culture swab of the wound has been requested.
Furthermore, antirabic and antitetanus immunization, as well as be-
tamethasone and ketorolac tromethamine were given to the patient.
The original plan was to postpone the facial reconstruction to bet-
ter general conditions of the patient, so that an accurate and appro-
priate operation could take place. However after the results of the blood
and culture tests and the hyperthermia, we had to change the plans.
The blood test revealed severe thrombocytopenia, leukocytosis with
89% neutrophils, severe anemia, hypoglycemia, hypokalaemia. The
cultures test highlighted the presence of type 1 coagulase negative
Staphylococcus (resistant to: ampicillin/sulbactam, ciprofloxacin, clin-
damycin, erythromycin, gentamicin, imipenem, moxifloxacin G)
and type 1 Candida albicans. After a few days, the patient developed
septic-undulant hyperthermia (max 39.5°C), reduction in vision, de-
terioration of renal function, and folliculitis of pubis, axilla and scalp
associated with pain and itching. The fundus oculi test showed hyphas,
therefore the diagnosis was consistent with Candida retinitis. The ul-
trasoundography and urine cytology with periodic acid-Schiff stain showed
renal candidiasis. Systemic Candida infection was diagnosed and flu-
cinazole, nistatina, teicoplanin/levofloxacin were promptly given. De-
spite that, the fever persisted and the hemoculture was still positive
for Candida, therefore we gathered that Candida was resistant to flu-
cinazole. Amphotericin B was given to the patient that was then tran-
sferred to the Department of Infectious Diseases. The facial recon-
struction was postponed and as a consequence the wound had to be
managed conservatively. Every four days, complete wound detersion
was performed and a new Promogran dressing was applied. This pro-
cedure was continued for one month. The results consisted in an im-
mediate reaction of excessive granulation tissue formation, after the ini-
tial treatment (Fig. 2a); then, after a careful removal of the hypergra-
nulation tissue, a rapid re-epithelization was observed (Fig. 2b). The
result was functionally satisfactory, although from an aesthetic point
of view it was far from optimal.

Discussion

Dog bites represent a complex problem as well as a
public health challenge (4). Clinical sequelae of bite inju-
ries can extend far beyond simple wound management
(5). In cases of extensive mutilating craniofacial trauma
due to dog attacks, death may occur because of exsan-
guination, air embolism, and decapitation. Avulsion inju-
ries with significant tissue loss represent the most diffi-
cult cases for definitive treatment (6). Traumatic am-
putation of the face is a challenging problem to treat with
a main priority for functional outcomes (7, 8). Moreo-
ver, a very common complication of dog bites is infec-
tion, due to contamination of the wound by Gram-positive and Gram-negative microorganisms in the saliva (9, 10). The most frequently isolated bacteria are Klebsiella, Escherichia, Staphylococcus, Streptococcus, Citrobacter, Enterobacter, Moraxella, Acinetobacter, and Pasteurella and anaerobes (11, 12). However, in our case Candida was the contaminant organism, causing loco-regional and distant fluconazole-resistant candidiasis. On account of this severe infection, the face reconstruction had to be postponed. The facial wound was conservatively treated using Promogran, a protease-modulating matrix of oxidized regenerated cellulose and collagen. The product is a sterile, freeze-dried matrix which, once the exudate has been absorbed, forms an adaptable gel which is in turn naturally re-absorbed by the body. It is able to bind and inactivate any existing excess proteases (matrix metalloproteinases, plasmin and elastase) and bind and protect growth factors from proteolytical degradation. When the product is re-absorbed, any growth factors that have been bound will be re-delivered in their active form (13). In this way, it creates an environment that promotes granulation tissue formation. In addition, this active medication has haemostatic properties (14). The benefits of the dressing are the fact that this product is re-absorbable; this results in the simplicity use, conservation and cost-efficiency.

Several studies have demonstrated that this treatment modality physically modifies the wound microenvironment, and thereby promotes granulation tissue formation and stimulates wound repair (15-18).

The original plan was to apply the collagen/oxidized regenerated cellulose dressing to the wound only as an adjuvant medication, waiting for reconstructive surgery. However, since the patient developed a systemic Candida infection, the facial reconstruction had to be postponed and the patient was treated conservatively. The conservative treatment showed good results from a functional point of view.

Conclusion

The consideration of this case suggests that conservative management with collagen/oxidized regenerated cellulose dressing may be an alternative therapy in the treatment of large wounds with invasive candidosis and candidaemia or other major complications to surgery.

We can affirm that in cases where surgical reconstruction is not a feasible option, conservative treatment can allow a rapid repair of the skin barrier.

The costs of active medications such as Promogran are low and their effectiveness high and, most importantly, they show good functional results. Although aesthetic results are not optimal, a secondary surgical revision can be planned as soon as patient’s condition allow for this kind of operation.

References