

# Retrospective Analysis of Facial Dog Bite Injuries and Surgical Management at Plastic Surgery Centre: 10 Years' Experience, Vilnius University Hospital, Lithuania

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## Abstract

**Introduction:** Facial dog bites injuries are high risk of contamination, complex and cosmetic outcome is at its great importance.

**Methods:** 81 consecutive patients (46 adults and 35 children) treated for facial dog bite injuries at Plastic and Reconstructive Surgery Centre of Vilnius University Hospital, Lithuania between 1993 and 2012 were retrospectively reviewed. The following information recorded: age, number of facial aesthetic units involved, tissue loss, the duration between injury and surgical repair, type of repair, and complications. We divided patients in to two groups for analysis of the results. Patients with one facial aesthetic unit involved and patients with more than one aesthetic unit involved.

**Results:** First group of the 54 patients (38 adults and 16 children) with one facial aesthetic unit involved. 47 out of 54 wounds were with tissue loss, 7 out of 54 bite wounds without tissue loss. All 7 wounds without tissue loss were directly repaired. Out of 47 wounds with tissue loss 2 were directly repaired, 2 left to heal by secondary intention and 43 required reconstruction surgery with composite graft, skin graft, local or regional flaps. 76% of repairs were performed within 24 hours from the injury. 7 complications (13%) were recorded. 1 wound infection after direct closure and 6 out of 7 (86%) complications were composite graft loss. Second group of 27 patients (8 adults and 19 children) with more than one facial aesthetic unit involved. All 14 cases without tissue loss underwent primary closure. Out of 13 wounds with tissue loss 1 repaired directly, 12 required reconstructive surgeries. In this patient group were 5 complications (19%).

**Conclusions:** Children are more likely to sustain injury to multiple facial aesthetic units following dog bite. Direct repair of facial dog bite injuries is safe.

## Keywords

Reconstructive surgery; Facial dog bite; Plastic surgery

## Introduction

Dog bites is common injury and associated with high risk of contamination and subsequent risk of complications and poor outcome. Facial dog bites are even more complex as cosmetic outcome is at its great importance. Retrospective analysis of all dog bite facial injuries treated by Plastic Surgery department.

## Materials and Methods

Eighty one consecutive patients (46 adults and 35 children) treated solely by plastic surgery service for facial dog bite injuries at Plastic and Reconstructive Surgery Centre of Vilnius University Hospital, Lithuania between 1993 and 2012 were identified and retrospectively reviewed.

The following information was recorded: age of the patient, location of wounds, antibiotic cover, how many facial aesthetic units were involved (one or more), tissue loss, the time from dog bite injury to surgical repair, type of repair, and early complications.

We have divided patients into two groups for analysis of the results. First group of patients with one facial aesthetic unit involved and second group of patients with more than one aesthetic unit of the face involved. We have used facial aesthetic unit description described by T Fattahi [1].

## Results

First group of the 54 patients sustained facial dog bite injury and had one facial aesthetic unit involved. Majority of patients 38 (70%) were adults and 16 (30%) children. All patients in this group were prescribed antibiotics, 48 patients (89%) prescribed Intravenous antibiotics and 6

patients (11%) oral antibiotics. Majority of the patients 87% (47 out of 54) sustained wounds with tissue loss. Wounds with tissue loss involved cheek, nose and lip regions. Only 13% of patients (7 out of 54) had bite wounds without tissue loss. Surgical management of wounds with or without tissue loss were different. All 7 wounds without tissue loss were directly repaired. Wounds with tissue loss on the other hand had more complex surgical management. Out of 47 wounds with tissue loss 2 were directly repaired, 2 were debrided and left to heal by secondary intention and 43 required reconstruction surgery with composite graft, skin graft, local or regional flap. The duration between injury and repair ranged from 1 to 4 days. This wide range of surgical repair timing was due to number of patients referred from regional hospitals and it is important to notice that, primary wound washout wasn't casted as Surgical repair. Most of the repairs 41 out of 54 (76%) were performed within 24 hours from the injury. 7 complications (13%) were recorded in this patient group. One wound infection after direct closure and other 6 out of 7 (86%) complications were composite graft loss.

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Second group of 27 patients with more than one facial aesthetic unit injured. In this group 8 adults and 19 children. All patient were prescribed antibiotics: 24 (89%) intravenous antibiotics, and 3 (11%) patients took oral antibiotics. Interestingly in this group wounds with tissue loss and without tissue loss were almost equal. 14 (52%) patients had bite wounds without tissue loss and 13 wounds on examination were described as wounds with tissue loss. Surgical management again was different in cases with and without tissue loss. All 14 cases without tissue loss were washed out and repaired by primary closure. Out of 13 wounds with tissue loss 1 has been repaired by direct closure - tissue loss in this case was described as minimal, other 12 required composite graft, skin graft, local and regional flaps to reconstruct the defect. In this patient group 5 complications (19%) were documented. 2 wound infections both after direct closure cases, 1 composite graft loss, 1 regional flap partial necrosis, and 1 scar contracture (Figure 1).

**Discussion**

Historically primary repair of dog bite wounds after initial debridement was thought to increase risk of infection and delayed repair, reconstruction or even leaving wound to heal by secondary healing was treatment of choice for decades. In recent years more and more publications showed evidence that primary closure of the dog bite wounds has not significantly increased risk of post-operative infection neither had impact on cosmetic outcome [2-4]. Recent randomised trials [5,6] was primarily reason to review our practise as we have notice shift towards primary repair and reconstruction of dog bite injuries and didn't see any increase in complication rate.

We have divided patients in two groups based on aesthetic units of the face involved, and results have confirmed provisional thought that patients with one aesthetic unit involved were more likely to have tissue loss (87% of all patient with one aesthetic unit of the face injured), then patients, who sustained injury to more than one facial unit (48%). This is due to nature of injury. Patients with one aesthetic facial unit injured had mostly had bite amputations of nose, lip or cheek. At the same time patients with more than one facial aesthetic unit involved had multiple puncture wounds.

Results also show that children were more likely to sustain multiple facial aesthetic unit injuries when bitten by dog. But that is self-explanatory due to size of children face [7-9].

Our retrospective analysis shown that primary treatment of choice were debridement and closure of wounds. This resulted in good outcomes and low complication rate (less than 4%) [10-11]. Our analysis has shown that composite graft reconstruction cases had significantly higher rate of complications.

We have looked into all composite graft cases and noticed that it were 11 cases of composite graft (20% of all reconstructive cases) . Majority of them were done in early years of review period (1993-

2002). Since 2003 composite graft was only done once. Composite graft as surgical technique had complication rate of 55% which is unacceptably high.

We have also known now from recent trials that antibiotic prophylactic use is no longer recommended [4]. In our analysis we found that 100% of our patients were prescribed antibiotics and 89% of them had Intravenous antibiotic prescribed. It is still in our in house protocols and guidelines that all dog bites routinely given antibiotic cover prior to surgery and few days post operation. It is something we probably have to discuss with our Microbiology department and review need of routine antibiotic use.

**Conclusion**

Children were more likely to sustain injury to multiple facial aesthetic units following dog bite, than adults. Direct repair and reconstruction of facial dog bite injuries at the earliest opportunity resulted in good outcomes and low complication rate. Composite graft reconstruction proved to have highest complication rate and is not very reliable reconstructive option in facial reconstruction after dog bite injury. Wound infection rates were low in both groups of the patients (less than 4%).

**Conflict of Interest**

The authors report no conflict of interest.

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