

# At Isırığına Bağlı Burun Yaralanmasının Rekonstrüksiyonu: Olgu Sunumu

## Reconstruction of a Nasal Injury Caused by a Horse Bite: Case Report

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#### Abstract

In this context, we present a rare case of a pediatric patient who was bitten by a horse. The child had a subtotal nasal amputation. In the literature, there are examples about injuries of different animals. But to the best of our knowledge, there is no data about a nasal horse-bite and its reconstruction in the literature. Bites almost always cause defective crush injuries. We reconstructed the defect by applying a tissue expander to a paramedian forehead flap. This flap provided a well-vascularized, color-matched skin with appropriate thickness and covered the tip, columella and one-third of the alae.

Key words: **Bites and Stings; Horses; Surgical flaps; Tissue Expanders.**

#### Özet

Bu olgu sunumunda bir çocuk hastanın at ısırığı ile oluşan nazal defektinin değerlendirilmesi ortaya konmuştur. Hastada subtotal nazal amputasyon oluşmuştur. Literatürde farklı hayvan yaralanmaları ortaya konmuş fakat burunda at ısırığı ile ilgili herhangi bir bilgiye rastlanmamıştır. Defektin yanı sıra ezilmeye de sebep olan ısırığa bağlı yaralanmalar burunda meydana geldiğinde rekonstrüksiyonu zor hale sokmaktadır. Bu olgu sunumunda burunda nadir görülen at ısırığı yaralanmasının doku genişletici ile alın flebi yapılarak rekonstrüksiyonunu ortaya koyduk. Kanlanması ve doku uyumu iyi olan bu fleple tip, kolumella ve burun kanadının üçte biri kapatıldı.

Anahtar kelimeler: **Atlar; Cerrahi flepler; Doku genişleticiler; Isırıklar ve Sokmalar.**

## Introduction

Among horse-related injuries, the most common non-fatal area of injury is the trauma of the face (1). In Middle Anatolia region of Turkey, Tuncali et al. found the bite series to be dogs (76%), cats (22%), followed by a small percentage (2%) of other animal bites such as; horses, donkeys, cows and rats (2). Bites are the rarest type of horse-related injuries. Despite this, severe injuries do occur (3). To the best of our knowledge, there is no data about a nasal horse-bite and its reconstruction in the literature.

Nasal reconstruction of the nose is still remaining as a challenge for reconstructive surgery. Forehead flaps have long been used for this region but because of the tense skin, narrow forehead and psychological effects, it has been a hard work in pediatric patients. The restoration of an aesthetic, functional and durable nose with minimization of the donor site deformity is the primary goal.

## Case Report:

A 10-year-old boy was presented with a subtotal nasal amputation after a horse bite (Pic. 1). The bitten part of the tissue was eaten by the animal so there was not a chance of a composite graft. The child was treated with ampicillin-sulbactam and clindamycin for 9 days in respect of pediatric consultation. Without any sign of infection, the wound healed in a week with local wound care and left an unwanted appearance on the face.



**Picture 1.** Ten-year-old boy with horse bite and subtotal amputation.

A three-stage reconstructive plan was instituted. Eight days after injury, the patient underwent the first stage of nasal reconstruction. In the first stage, through a 5cm incision on the left frontoparietal region 2cm above the forehead hairline, a subgaleal pocket was dissected. A 70cc round tissue expander and a remote port was inserted. Tissue expansion was performed in a 4 week period to a volume of 130cc (Pic. 2).



**Picture 2.** Completion of forehead tissue expansion.

In the second stage, nasal reconstruction was completed at the end of the expansion period. A forehead flap with a columellar length of 1cm and bilateral alar base distance of 2.5cm was planned. The expanded forehead flap was raised, based on the left supratrochlear vascular pedicle. The distal portion of the flap was thinned in order to create a columella and nasal ala. Nasal stents were used to prevent stenosis. A drain was inserted beneath the flap. The flap was transposed to complete the nasal reconstruction (Pic. 3). No bone or cartilage grafts were used. The forehead incision was closed primarily. In the third stage, the flap pedicle was divided 3 weeks after transposition. The pedicle was returned to its site of origin. In order to avoid a supratip contour deformity, after dividing the pedicle, 5mm of the proximal end of the flap was desepitelized, thinned and buried to the superior end of the defect. Thus, we obtain a good contour between the flap and nasal root.



**Picture 3.** Paramedian forehead flap transposition.

During the operation, undermining the flap was not necessary. After the surgery, there was not any problem in the nasal airway and the nasal base was symmetrical. No signs of infection due to the horse bite were observed. There was no need for revision surgery as the flap had a good contour and dimension. (Pic. 4) The patient satisfaction was perfect.



**Picture 4.** Direct and lateral views of two months postoperatively. Note the contour of the tip and the soft triangle which does not need a revision.

### Discussion

Animal bites create wounds feasible to infections so patients must be treated with caution. Although some authors believe that horse bites do not frequently transmit infectious organisms (3), we treated the child with empiric antibiotics of ampicilline-sulbactam and clindamycin, seeing in some studies that *Actinobacillus* species are isolated from horse-bite wounds (4, 5).

As the central focal point of the face, the nose has an undeniable psychosocial significance especially in children. This means that it is extremely important to obtain not only functional, but aesthetic results as well in reconstruction of the nose. Bites almost always cause defective crush injuries. Such injuries on the nose continue to challenge the reconstructive surgeon.

Specifically, the usage of forehead flaps for nasal reconstruction originated in India with the midline forehead flap technique (6). Since then, many modifications have been proposed to overcome limitations of donor-site morbidity, flap length and pedicle width (7-11). The oblique forehead flap, tissue expansion, or extension of the flap into hair-bearing scalp, are some of the modifications which are possible (12-14). We preferred tissue expansion with the paramedian forehead flap modification in this case because of the taut and narrow forehead skin which would not provide adequate coverage.

Supratrochlear artery is mostly used in the pedicle of forehead flaps. The supratrochlear artery originates from the medial one-third of the eyebrow, approximately 2cm laterally from the midline, and extends vertically on the forehead. Some studies show that the end arterioles of the supratrochlear vessels travel superficial to the frontalis muscle in the upper third of the flap (15, 16). This provides a chance to thin the flap and improve the ability to contour to the defect. However, in some studies on nasal reconstruction, most patients undergo at least one secondary revision surgery to contour the flap (17). According to this knowledge we thinned the distal portion of the flap and achieved the desired definition of the nasal subunits like the tip, columella and nasal ala which in result had no need for debulking surgery.

Burget and Menicks have described some basic principles in reconstruction of the nose in children (18). These include carefully conservation of the donor site for potential further surgery and usage of paramedian forehead flap if

possible. The usage of the paramedian forehead flap in children gives the advantage of using only one of the supratrochlear arteries. So this gives a chance of harvesting a second forehead flap if needed (15). One of the reasons in choosing the paramedian forehead flap in this case is this principle which provides a chance of preserving another forehead flap for further need.

Forehead flaps combined with tissue expansion techniques have recently been popular applications for nasal reconstruction, yielding a wide, well-vascularized flap with primary donor-site closure (12, 14, 19-27) An expanded forehead flap provides a thin, durable skin with a chance of covering large defects. Because it is thin already, the reconstruction of the nose is accomplished more easily giving a good contour. So there is no need for a revision surgery afterwards. This shows that a three-stage expanded forehead flap is equivalent to a classic forehead flap in terms of the number of operations the patients undergo.

Forehead flaps have good results with low rates of necrosis. But additional problems, such as infections, can affect the survival of the flap. We tried to avoid any infectious problem so as to obtain a good result of the reconstruction.

One disadvantage of the paramedian forehead flap, whether it is expanded or not, is the vertical forehead scar. To minimize the tension of the wound, some authors try to achieve this by widely undermining the forehead skin to the temporalis muscle bilaterally (15). Although this is a usual problem in all paramedian forehead flaps, expanding the flap decreases the tension and eliminates the need of undermining the forehead skin.

In conclusion, a rarely seen horse bite can cause a severe crush injury. If the patient is a child and the wound is on the nose, reconstruction gets more challenging than ever. The variables to be taken into consideration increase. The crush injury of the wound, possible infections caused by the horse, the three dimensional properties of the nose are all to be assessed. Although the forehead flap represents one of the best methods of nasal reconstruction, it has many modifications to be chosen. So, preoperative evaluation is as important as the operative skill and experience. Especially in children with such crush injuries, a thorough understanding of anatomy and aesthetics is vitally important. When these are achieved, outstanding functional and cosmetic results can be obtained.

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