International Surgery Journal
Lizbeth DVT et al. Int Surg J. 2023 Dec;10(12):2006-2009
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: https://dx.doi.org/10.18203/2349-2902.isj20233509

Case Report

V-Y flap as a treatment for lower lip bite

Daza Villa Tavata Lizbeth*, Villareal Salgado Jose Luis, Grano Gonzalez Victor Hugo, Reyes Garcia Victor Gibran, Vargas Montes Jose de Jesús, Garcia Marin Gustavo Emmanuel, Gaxiola Guarneros Luis Esteban, Reyes Gutierrez Mayra Yilzett, Ramirez Soto Ana Laura, Ortega Fernandez Alexis

Department of Plastic and Reconstructive Surgery, Hospital Regional Valentín Gómez Farías ISSSTE, Zapopan, Mexico

Received: 04 October 2023
Revised: 25 October 2023
Accepted: 30 October 2023

***Correspondence:**
Dr. Daza Villa Tavata Lizbeth,
E-mail: tavata.daza@gmail.com

ABSTRACT

Dog bite wounds are problems that emergency centers around the world observe and treat frequently. The saliva of these animals is a potential pathological factor since multiple microorganisms are found in it, in addition to the fact that some of the lesions can deform facial symmetry with possible functional repercussions. This article aims to present the clinical case of a 12-year-old patient with a dog bite who underwent V-Y flap reconstruction.

Keywords: Dog bite, Lip reconstructive procedure, V-Y flap

INTRODUCTION

In the United States of America, approximately 4.5 million people are bitten by dogs each year. Of them, nearly 885,000 seek medical attention, 30,000 undergo reconstructive procedures; Between 3% and 18% develop infections and 10 to 20 deaths occur.[1] Dog bites represent the most common mammalian bites treated in emergency departments, accounting for approximately 76%, followed by cat bites and human bites.[2] Most facial dog bites affect the pediatric population, the most common age is between 0-10 years, men are most commonly affected up to 67%.[3,4] The most common sites of facial injury after a dog bite included the lips, cheeks, and nose.[5] Predisposing factors are the short stature of children, the disproportionate size of the head with respect to the body, their willingness to put their face close to the animal, and limited motor skills to defend themselves and escape.[3]

The force exerted by the jaw of an adult dog can reach 450 pounds per square inch. The sharp teeth of these mammals can cause three main types of soft tissue injuries: punctures, lacerations, and avulsions with or without tissue defects.[3] Facial injuries from dog bites result in significant emotional, psychological, and physical trauma for the victims involved.[5] Cleaning, debridement and adequate irrigation are necessary to control infections, as is treatment with antibiotics such as amoxicillin with clavulanic acid 3-5 days or cephalexin (1st generation cephalosporin) 3-5 days or clindamycin plus ciprofloxacin 3 -5 days.[6-9] Most infections caused by dog bites are polymicrobial, with mixed aerobic and anaerobic species. Includes aerobes *Pasteurella multocida*, *Pasteurella canis*, *Staphylococcus aureus*, *Viridans streptococci*, *Capnocytophaga canimorsus*, *Bacillus suppuratus*, *Actinomyces suppuratus*, and oral anaerobes *Prevotella*, *Clostridium* and *Peptostreptococcus*.[8]

Clinical data of infection A significant wound infection is defined as fever (more than 38°C), lymphangitis, abscess, or at least four or five minor criteria: erythema, tenderness, swelling at the wound site, purulent discharge, and leukocytosis of more than $12x10^9/l$.[10] The treatment of injuries caused by the bite is proportional to the damage caused by the dog bite, since canine jaws can have a force of up to 31,790 Kpa, which can generate potential tissue damage.[11] In general, the treatment of choice for facial dog bite injuries was largely primary closure. When the wounds are clean, they are treated with minimal placement of fine monofilament suture, without tension, and early removal of the suture (3 to 5 days) or the use of N-butyl-2-cyanoacrylate can be considered.[12] When this cannot be performed, the most commonly performed surgical treatment is a local or advancement flap, a full-thickness skin graft, or a split skin graft.[5]

The lesion resection is performed in a rectangular shape. The flap design is triangular, with the apex positioned inferiorly. The base of the triangle must coincide with the total width of the lip defect and is the lower edge of the resection. The length of the flap or I also consider the height of the triangle must be at least twice the height of the defect. Providing mobility without tension and without harming the vascularization of the flap. To allow the transfer of the flap, it is necessary to perform a blunt dissection of the subcutaneous cellular tissue in the tissues surrounding the flap. This dissection must be performed with caution to avoid injury to the tissue perforators. The V-shaped flap is moved superiorly to close the rectangular skin defect, thereby suturing it and establishing the "Y" shape.[13] Follow-up appointments for wound review should be made within 24 to 48 hours. Attention to patient counseling, dressings, ointments, cleansing, and scar revision ensure optimal results.[12]

Prevention

Rabies threatens millions of people in developing countries. Thousands of victims die every year, despite being a disease that can be prevented with vaccines.[10] A risk assessment for tetanus and rabies should be performed.[14-15] Biting animals whose vaccination status is unknown or unclear and that are available for quarantine should be observed for 10 days.[12] When they are dogs from the same household after the bite, the pet owner should be helped to identify why the bite occurred. If the child is only exposed to the dog for short periods or if it is long-term, the dog's behaviors and underlying reasons should be addressed, along with implementation of environmental barriers (such as doors) and pet training.[15]

CASE REPORT

A 6-year-old male patient, with no relevant clinical history, who began his current condition on December 17, 2022, at approximately 5:00 pm, when, while playing with his neighbor, he leaned back to gather a ball and suffers a dog bite on the lower lip, which has a complete vaccination schedule, so she is taken by her mother to this hospital where she undergoes a physical examination where loss of tissue is observed on the lower lip on the left side of approx. 1 cm x 8 mm approx. 5 mm deep, no active bleeding evidence.

Figure 1: Dog bite injury.

Figure 2: Incision on lower lip.

Figure 3: Post-surgical images after 2 weeks.

Therefore, primary closure is considered, which cannot be carried out, so a V-Y flap is created. He was kept under observation for 24 hours, with no signs of bleeding during his stay; with adequate preservation of sensitivity and mobility. Therefore, he is discharged and evaluated fifteen days after the procedure.

DISCUSSION

The lips are made up of various structures that comprise multiple layers, such as skin, subcutaneous tissue, muscle, submucosa, and mucosa.[16] These are part of the facial aesthetic balance, in addition to expression, speech and chewing.[17] Dog bites represent the most common mammalian bites treated in emergency departments.[2] Most dog facial bites affect the pediatric population, the most common age is between 0-10 years, men are the most commonly affected gender.[3-4] Treatment of dog bite wounds should include elements of history, physical examination, laboratory studies, therapeutic intervention, and prophylactic measures.[12] In the studies reviewed, primary wound closure is the treatment of choice to repair a defect smaller than one-third of the lower lip.[5,16,17] and for all non-infected facial bite wounds observed within 24 h, because This results in the most favorable aesthetic result without significantly increasing the wound infection rate.[12,5] When this cannot be carried out. The most commonly performed surgical treatment is a local or advancement flap, full-thickness skin graft, or split skin graft.[5,16] The V-Y flap is a very simple advancement flap: the skin is raised like a "V" and displaced by directly suturing the remaining defect, thus forming a "Y"-shaped suture. This type of flap can be used to reconstruct defects in multiple locations on the face (forehead, cheek, nose, eyelid, neck); The looser the tissues, the greater the possibility of flap translation and, therefore, the greater the defects that can be reconstructed. This type of flap is indicated in those cases in which a wedge resection generates a large amount of healthy tissue.[13]

The advantages of using an advancement flap for lower lip reconstruction are as follows: it maintains sensation of the affected site; there are no problems associated with oral competence and mouth opening in most cases; the color, texture, and contour of the reconstructed vermilion are aesthetically acceptable; little morbidity at the donor site. Prophylactic management is extremely important because if complete vaccination is not available, antibiotics should be started, with amoxicillin with clavulanic acid being the preferred choice.[6-9] Another important part of managing dog bite wounds is monitoring the wound and any infection data it may present.[10] Since it can present important consequences in the development of the lip and its functions.[5]

CONCLUSION

The present study highlights that children are more frequently affected by dog bite injuries to the face compared to adults. The victim usually knows the dog involved in the attack, with the lips, cheeks and nose being the most common sites of facial injury. Treatment of this type of injury is mainly performed with primary closure and prophylactic antibiotics. However, when this cannot be done. Reconstructive procedures typically involve a local or advancement flap, full-thickness skin graft, or split skin graft. Depending on the characteristics of the injury. An inadequate reconstruction can cause distortion of the lips, sensory loss, and the functions. Therefore, from there derives the importance of knowing other techniques for skin coverage, such as the V-Y flap, as a repair technique. As a result of immediate surgical intervention of facial injuries, the most favorable aesthetic result is obtained without significantly increasing the rate of wound infection.

ACKNOWLEDGEMENTS

Authors thank Dr. Villarreal and his work team at Valentín Gómez Farias, ISSSTE for their contribution to the development of this clinical case.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Organización Mundial de la Salud. Mordeduras de animales. Available at: https://www.who.int/news-room/fact-sheets/detail/animal-bites. Accessed on 20 September 2023.
2. Edens MA, Michel JA, Jones N. Mammalian Bites the emergency department: recommendations for wound closure, antibiotics, and postexposure prophylaxis. Emerg Med Pract. 2016;18(4):1-20.
3. Sreeramaraju V, Babu VS, Sharma MK, Jha MK, Bhattacharya S. A retrospective observational study of facial dog bite injuries and its management in a tertiary care center. Indian J Plast Surg. 2023;56(4):367-72.
4. McGuire C, Morzycki A, Simpson A, Williams J, Bezuhly M. Dog Bites in Children: A Descriptive Analysis. Plast Surg. 2018;26(4):256-62.
5. Ali SS, Ali SS. Dog bite injuries to the face: A narrative review of the literature. World J Otorhinolaryngol Head Neck Surg. 2022;8(3):239-44.
6. Piccart F, Dormaar JT, Coropciuc R, Schoenaers J, Bila M, Politis C. Dog Bite Injuries in the Head and Neck Region: A 20-Year Review. Craniomaxillofac Trauma Reconstr. 2019;12(3):199-204.
7. Cavalcanti AL, Porto E, Dos Santos BF, Cavalcanti CL, Cavalcanti AFC. Facial dog bite injuries in children: A case report. Int J Surg Case Rep. 2017;41: 57-60.
8. Lin W, Patil PM. Facial dog attack injuries. Indian J Surg. 2015;77(1):55-8.
9. Simao NR, Borba AM, da Silva AL, Vieira EM, Carvalhosa AA, Bandeca MC, et al. Animal bite injuries to the face : A Case Report. J Int Oral Health. 2013;5(4):68-72.

10. Kesting MR, Holzle F, Pox C, Thurmuller P, Wolff KD. Lesiones por mordedura de animal en la cabeza: 132 casos. Br J Oral Maxilofac Surg. 2006;44(3):235-9.
11. Jha S, Khan WS, Siddiqui NA. Mammalian bite injuries to the hand and their management. Open Orthop J. 2014;8:194-8.
12. Chhabra S, Chhabra N, Gaba S. Maxillofacial injuries due to animal bites. J Maxillofac Oral Surg. 2015; 14(2):142-53.
13. Alicia DF, Francisco AG, García-Nieto AV. Reconstrucción labial inferior mediante colgajo en V-Y. Colg Ling Piel. 2003;18(2):101-4.
14. Jakeman M, Oxley JA, Owczarczak-Garstecka SC, Westgarth C. Pet dog bites in children: management and prevention. BMJ Paediatr. 2020;4(1):e000726.
15. Schalke E. Best advice to a dog owner whose dog has bitten someone : Mills DS, Westgarth C, Dog bites: a multidisciplinary perspective. UK: 5m Publishing; 2017: 343-9.
16. Kim HI, Kim HS, Park JH, Yi HS, Kim YS, Kim HY. Reconstruction of a small defect of the lower vermilion adjacent to white roll using a modified O-Z flap. Arch Craniofac Surg. 2021;22(3):164-7.
17. Kiuchi T, Yazawa M, Ohshiro T, Kishi K. Modification of the position of the angulus oris with a rotation flap and a YV flap in lip reconstruction. Arch Plast Surg. 2020;47(3):277-80.

Cite this article as: Lizbeth DVT, Luis VSJ, Hugo GGV, Gibran RGV, Jesús VMJ, Emmanuel GMG, et al. V-Y flap as a treatment for lower lip bite. Int Surg J 2023;10:2006-9.