

Dog Bites Distribution and Management in Head and Neck Region

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ABSTRACT

Keywords: Head and Neck, Dog bites.

Introduction: The Head and Neck region is the most vulnerable area for dog bites in children. Surgical management is an emergency to prevent infection, functional and aesthetic outcomes. The aim of this study was to find the age group, sex and area of population which is most susceptible to dog bites, and to determine the best treatment policy.

Materials and Method: Fifty-eight patients with dog bites who were bitten by stray dogs in the above mentioned area of the body were included in the study. All the patients were managed by resuscitation and washing of wound thoroughly with soap and water. After that, debridement of wound was done if required. In Fresh wounds with no significant skin loss, primary closure of wound was done in one group of patients using minimum possible stitches with 5 0' proline thread. In the other group, wound was left for healing by secondary intention.

Results: This study showed that 62 % of patients were from rural area. Dog bites in head and neck region were more common in males than in females (60% and 40% respectively). Most patients were in the age group of 6 to 10 years. Highest number of patients had bites on cheek (31%). Out of 58 patients, 48 had healthy wounds and 16 patients had necrotic wounds. In the primary closure subgroup of wounds, we observed that those patients had a cosmetically good scar, shorter healing time and lesser analgesic requirements as compared to subgroup of patients in which the wounds were allowed to heal by secondary intention.

Conclusions: Male children in rural areas are most susceptible to dog bite injuries. This study shows that primary repair of healthy dog bite wounds has many advantages and should be done in all such cases.

INTRODUCTION

Dog bites are a major source of morbidity and mortality worldwide, accounting for up to 1.5% of all visits to emergency medicine units (EMUs).¹ They represent an even higher financial and disease burden in rabies-endemic areas.² Prophylaxis against rabies represents a significant proportion of EMUs' annual drugs budget. Since rabies is almost

universally fatal, its control is of paramount importance in endemic areas.

Dog bites account for 0.3% to 1.5% of all pediatric presentations for medical attention^{3, 4} and almost 50% of children who have sustained dog bites.⁵ Dog bites occur more frequently in young children^{6,7} and may lead to a serious injury or death,^{8,9} usually from exsanguination.¹⁰

The location of injury due to dog bites is

largely dependent on age. In younger children, the most frequently affected areas are the head, face, and neck.^{11,12} As the child grows, bites to the extremities are most common⁴. The most challenging aspect of primary closure of wound increases the chance of wound infection after primary closure. On the other hand, bad cosmetic results after secondary healing especially in head and neck region favors the choice of primary Closure. This study was conducted to elicit whether primary closure of healthy dog bite wounds with no significant loss of skin have any advantage over secondary repair.

MATERIALS & METHOD

This retrospective study was conducted in Department of Otorhinolaryngology- Head and Neck Surgery, Government Medical College, Srinagar J&K, India. It continued for a period of two years from May 2011 to April 2013. This study included all dog bites in ear, nose, and throat and head neck region. This study was approved by institutional ethics committee. Total of 58 patients with dog bites who were bitten by stray dogs in above mentioned area of body were included in the study. All patients were managed by resuscitation of patient and washing of wound thoroughly with soap and water. Debridement of wound was done if required. Fresh Wounds with no significant loss of skin were distributed in two groups. Primary closure of wound was done in one group of patients (Group I) using minimum possible stitches with 5⁰ proline thread. In second group (Group II), wound was left for healing by secondary intention. All Infected and necrotic wounds were left for healing by secondary intention after proper debridement of wound. Oral antibiotics (amoxicillin plus clavulanic acid) and analgesics (paracetamol) were prescribed to all the patients. Rabies vaccination 5 doses (on 0, 3, 7, 28 and 90th day) and antirabies serum was injected into all patients. Tetanus vaccination was given depending on status of immunization. Sterile dressing of wounds was done on alternate day basis using povidine iodine in both groups of patients. Wounds with

significant skin loss and necrotic wounds were excluded from the study. Dog bite infection rates are 15 to 20 per cent.^{13, 14}. The most common organisms causing infection are *Pasteurella multocida*, *Staphylococcus aureus*, and *Capnocytophaga canimorsus* although many other organisms may also be present. Swabbing the wound is usually not helpful.¹⁶ Copious irrigation of wounds is the major treatment for reducing the risk of infection^{15, 16, 17}. In minor superficial wounds clean water may be used at the scene¹⁸. Otherwise normal saline is recommended, preferably under pressure with a syringe and 18 G needle, angiocath, or wound irrigator¹⁵. Irrigation may require pain relief.

Devitalized tissues should be debrided again to lessen the risk of infection. X-rays may be required when wounds are near a joint, or to exclude retained teeth. In our study we started management with copious irrigation of wound with normal saline and then debridement of all necrotic wounds. Primary wound closure is a debated issue for dog bites.¹⁶ Delayed primary closure can be done at three to five days. If the wound is recent (less than eight hours), has minimal crush injuries, or is at a site with excellent blood flow (such as face, scalp, or ear), it may be safe to close the wound after adequate irrigation.¹⁷

RESULTS

Demographics of patients as given in table 1 showed that 62 % of patients were from rural area and 38% from urban area. Our study showed that dog bites in ENT and head neck region were more common in males than in females (60% and 40% respectively). Most of the patients were in the age group of 6 to 10 years with 41% and second highest age group being 11- 15 years (38%). Highest number of patients had bites on cheek (31%) with second highest patients having bites on lips (26%, figure 1).

Among healthy wounds group of patients 29 patients had healthy wounds with no significant loss of skin, where as 13 patients had healthy wounds with loss of skin (table 2). Out of 58 patients, 48 had

healthy wounds were as 16 patients had necrotic wounds (table 3). Subgroup in which primary closure of wound was done, we observed that these patients had cosmetically good scar and healing time

was less as compared to subgroup of patients in which wounds were allowed to heal by secondary intention. Comparison between two groups of healthy dog bite wounds with no significant skin loss was given in table 4.

Table 1. Demographics of patients

<u>Parameter</u>	<u>No.of patients n=58 (%)</u>
Residence	
Rural	36 (62)
Urban	22 (38)
Sex	
Male	35 (60)
Female	23 (40)
Age	
0-5 years	08 (14)
6-10years	24 (41)
11-15years	22 (38)
Above 15 years	04 (07)

Table 2. Status of healthy wounds n=42

<u>Parameter</u>	<u>No.of patients n=42 (%)</u>
Healthy wounds with no sig. Loss of skin	29 (69)
Healthy wounds with significant loss of skin	13 (31)

Table 3. Time of presentation in hospital and nature of wound n=58 (%)

<u>Time of presentation after injury</u>	
Within 8 hours	26 (45)
From 8-24 hours	30 (52)
After 24 hours	02 (03)
<u>Nature of wound</u>	
Necrotic wounds	16 (28)
Healthy wounds	42 (72)
Patients with single wound	44 (76)
Patients with multiple wounds	14 (24)

Table 4. Comparison between the two groups of healthy dog bite wounds with no significant skin loss

<u>Parameter</u>	<u>Group I</u>	<u>Group II</u>	<u>P value</u>
Average no. of days after which patient started their normal activities.	8 days	17days	<0.005
Average no. of days for which analgesics were required by patients.	6 days	11 days	<0.005



DISCUSSION

Young children are most prone to dog bites involving face, head and Neck area^{21, 22} because they are small, defenseless, and often fearless. In this study highest numbers of dog bites were reported in age group 6 to 10 years and cheek was the commonest site. Fortunately, because of excellent blood supply, facial wounds become infected less often than other areas²².

In the current study 16 patients had necrotic wounds and 42 patients had healthy wounds. Forty-four patients had single wound were as 14 patients had multiple wounds. Primary wound closure is a debated issue for dog bites.¹⁶

Jones and Shires in 1979²³ and Weberin 1991²⁴ advocated delayed rather than primary repair of all facial dog bites because of the high risk of infection. Goldstein in 1991¹⁹ and Lewis in 1995²⁰ suggested that wounds seen more than 24 hours after the bite should be left open. Many surgeons now believe that primary repair gives the best functional and aesthetic results²¹. In this study, 26 patients reported in hospital within 8 hours of injury, 30 patients reported within 8- 24 hours of injury and 2 patients reported after 24 hours of injury.

Our initial management included copious irrigation with 150 ml saline via a syringe with a 19-gauge needle, to reduce the bacterial count²⁰. Irrigation with antibiotic or iodine solution is no more effective and may increase tissue irritation¹⁹. Careful debridement of devitalized tissue is essential^{25, 26, 27}. With these precautions, primary repair of dog bites to the face carries no greater hazard than delayed repair. Our infection rate of 17.6% is comparable with Palmer's 14.7% in the UK²⁸.

If primary closure of dog bite wound is to be done, closure should not put tension on wounds and as few sutures as possible should be used. If tension is evident on review of the wound it is better to remove sutures earlier rather than later. In our study we distributed all patients with healthy wounds into two subgroups. In one group, primary closure of wound was done with minimum possible stitches using 5⁰ proline thread and in other sub group wound was allowed to heal by secondary intention. All unhealthy wounds were allowed to heal by secondary intention. We found that Average number of days after which patient starts their normal activities and average number of days for which analgesics were required by patients were significantly less in primary wound closure group in comparison to secondary wound closure group.

CONCLUSIONS

Dog bite wounds are common in ENT and head neck region. Male children in rural areas are most susceptible. Type of repair in dog bite wounds is a debatable topic, however; this study showed that primary repair of healthy dog bite wounds had many advantages and should be done in all such cases.

Conflict of Interest: None

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