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Surgical management of oropharyngeal wound using polypropylene mesh in a Dog

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Abstract

To report the clinical findings, surgical management and outcome in dog with acute oropharyngeal wound due to dog bite. A 3 year old non descript male dog was presented with the history of dog bitten wound in the ventral aspect of neck region, unable to swallow and drink due to leakage of food through the wound. On clinical examination, extensive tissue loss of ventral neck muscles exposing oropharynx and epiglottis leading to leakage of food material. Physical parameters like temperature, respiration and pulse rate were within the normal physiological range. Haematobiochemical values were within normal range except for decreased hemoglobin and leukocytosis. Emergency surgical intervention was carried out by general anaesthesia. Surgical closure of muscles was apposed by using polypropylene mesh. Autologous Platelet Rich Plasma (PRP) was injected subcutaneously at the surgical site. Postoperatively parental antibiotics and anti-inflammatory along with fluid therapy were administered for seven days. Liquid diet was advised from 8th day and semi solid food from 14th day. Complete healing was noticed on 30th day postoperatively and animal had normal food intake. Animal made an uneventful recovery.

Keywords: Autologous platelet rich plasma, oropharynx, polypropylene mesh, dog

Introduction

Oropharyngeal wound associated with canine bite are relatively common wounds are among the most serious injuries which are designed for tissue penetration, the incisors for grasping, and the molars/premolars for shearing tissue (Klainbart *et al.*, 2021) [2]. The jaws of larger dogs in particular can generate tremendous crushing (up to 450 psi) and shearing forces, and the canine teeth can tear and lacerate the skin, hypodermis, and underlying musculature (Jordan *et al.*, 2013) [5]. Clinical signs associated with acute and chronic wound differ. Chronically affected dogs typically manifest systemic inflammatory response syndrome (SIRS) due to extensive tissue trauma, infection and devitalised tissue (Taney *et al.*, 2012) [1]. This report describes about the reconstructive surgery with polypropylene mesh due to bite wound and provides stabilization, injury assessment, wound management and outcome.

Materials and Methods

A 3 year old non descript male dog was presented to Veterinary Clinical Complex, RIVER, Puducherry with the history of dog bitten wound in the ventral aspect of neck region, unable to swallow and drink due to leakage of food through the wound. On clinical examination, extensive tissue loss to the ventral neck muscles including mylohyoideus, geniohyoideus, genioglossus and styloglossus were noticed and exposing oropharynx and epiglottis leading to leakage of food material (Fig 1). Physical parameters like temperature, respiration and pulse rate were within the normal physiological range Antibacterial sensitivity test on wound swab revealed sensitive to enrofloxacin and ciprofloxacin. Haematobiochemical values were within normal range except for decreased hemoglobin and leukocytosis. Based on the history, clinical observation and laboratory examination, the case was diagnosed as oropharyngeal wound and subjected for reconstructive surgery using a polypropylene mesh to avoid the recurrence.

Results and Discussion

Preoperatively, animal was stabilized with fluid therapy. Aseptic preparation of the surgical site was done.

Emergency surgical intervention was carried out by premedication with inj. Diazepam @ 0.5mg/kg b.wt and induction with inj. Propofol @ 4mg/kg b.wt. intravenously. After endotracheal tubation, animal was maintained with 100% oxygenation and maintenance of anaesthesia was achieved by 3% isoflurane inhalation anaesthesia. Reconstructive surgery of the wound was performed using polypropylene mesh. The wound edges were debrided and the surrounding tissue was apposed and the polypropylene mesh was placed on the ventral floor of the oropharynx and sutured by simple interrupted suture pattern using polyglactin 910 size 1-0 (Fig 2). Subcutaneous layer was apposed using polyglactin 910 size 1-0 by simple interrupted suture pattern and skin was closed by surgical staples and cross mattress suture (Fig 3). Autologous Platelet Rice Plasma was injected subcutaneously at the surgical site and therapeutic ultrasound massage was done around the surgical site at weekly interval. Postoperatively, the animal was maintained with fluid therapy, antibiotic and analgesics for 7 days. Post bite antibodies vaccination schedule was advised. On 8th postoperative day, the animal was given liquid diet and on 14th day, semisolid diet was advised and complete healing was noticed on 30th day (Fig 4). Animal made an uneventful recovery.

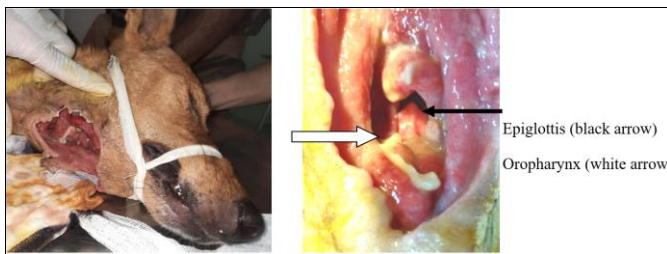


Fig 1: Showing extensive tissue loss to the ventral neck muscles exposing epiglottis and oropharynx



Fig 2: Polypropylene mesh placed and sutured using simple interrupted suture pattern



Fig 3: Skin closed by surgical staples and cross mattress suture



Fig 4: Complete wound healing by day 30 postoperative

Bite wound can inflict any part of the body areas, with the abdomen, limbs and thorax being the most common locations. Bite wounds affecting the neck region can cause damage to the central nervous system and upper airway (Klainbart *et al.*, 2021) [2]. In the present case, the wound was restricted to ventral aspect of the neck involving extensive muscle loss with mild respiratory difficulty and no nerve damage was found. Oropharyngeal wound can be challenging to manage due to number of vital structures in relatively superficial locations. It is likely that there was an absence of cervical and airway injuries (Jordan *et al.*, 2013) [5]. Mild respiratory difficulty was noticed due to exposure of epiglottis and oropharynx. Considering the severity of the wound it was decided for surgical repair using surgical mesh.

Polypropylene mesh is a network of non-absorbable monofilament has shown to facilitate the reconstruction of large tissue defects in small animals without much complication. It provided a structural support through which fibrous tissue proliferates through the mesh interstices to form a non-porous wall, so there is no leakage from the intact wall formed (Bellenger *et al.*, 2003) [4].

Autologous platelet-rich plasma (PRP) is known to enhance wound healing and tissue regeneration, given the high number of platelets, growth factors and cytokines in it contains and it is a natural physiological mixture of stimulatory and inhibitory mediators that have synergistic biological effects in the wound healing environment. Iacopetti *et al.* (2020) [3] reported that use of PRP in the large cutaneous wound achieved faster wound contraction and re-epithelialisation. Thus, it was concluded that successful surgical management of oropharyngeal wound using polypropylene mesh along with PRP was found to be effective without much complications and animal made an uneventful recovery.

Conclusion

Oropharynx plays a critical role in the pharyngeal phases of swallowing and a polypropylene mesh facilitate the reconstruction of ventral wall of the oropharynx which works as a scaffold along with autologous platelet-rich plasma was found to be effective without much complication.

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