

RECONSTRUCTION OF LARYNGO-TRACHEAL RUPTURE IN A GOAT

P Ravi Kumar¹, V Devi Prasad², Makkena Sreenu³ and D Bhagyaraj⁴

¹Assistant professor, ²Associate Professor, ³Professor & Head,

⁴Contract Teaching Faculty

Department of Veterinary Surgery and Radiology,

NTR College of Veterinary science, Gannavaram- 521 102(AP)

E-mail: ravikumarvallitvm1018@gmail.com (*Corresponding Author)

Abstract: A one year old male non descriptive goat with a dog bite wound on the ventral aspect of neck was diagnosed to have complete rupture of tracheal attachment with larynx. The animal was stabilized immediately and the condition was managed surgically under local infiltration analgesia without any postoperative complications. The surgical management and clinical outcome of the case were discussed.

Keywords: subcutaneous emphysema, tracheal rupture, tracheal anastomosis, larynx.

Introduction

Trachea is a large bore, thin walled tube reinforced with hyaline cartilage, connecting the larynx with bronchi (Hallers *et al.*, 2004). The c-shaped cartilaginous rings of trachea are interconnected by fibroelastic annular ligaments which aid in flexibility during movement of neck. The lumen of the trachea is covered with ciliated epithelium, which is highly reactive to lesions and induces proliferation of underlying tissues during wound healing (Schultz *et al.*, 2002). Tracheal injuries in animals may result from either intraluminal trauma by endotracheal tube or by extra luminal trauma during fights or automobile accidents (Miles 1999). Usually in wild life, injuries of trachea, esophagus and jugular vein of the animals are noticed which are resulted from attacks of other animals for prey. Tracheal injuries result in expression of characteristic signs like subcutaneous emphysema at cervical and thoracic region (Caylor and Moore, 1994).

Clinical signs like respiratory distress, dyspnea, exercise intolerance, cyanosis etc are also expressed depending upon the extent of tracheal injury. These tracheal injuries are easily diagnosed based on the symptoms exhibited, radiography and by tracheoscopy. In the present paper, diagnosis and management of tracheal transection from larynx in a goat is reported.

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Case History and Observations

A one year old male non descriptive goat was presented to clinics with a punctured wound due to dog bite on the ventral aspect of neck and at the base of the ear (Fig-1). Gushing of air through the wounds at the neck region was noticed besides respiratory distress. Localized subcutaneous emphysema was noticed which was suspected due to abnormal tracheal opening at the neck region caused by dog bite. The hematological and serum biochemical parameters were within the normal range. Mild hyperthermia with polypnoea was observed. On palpation, the gap between the trachea and larynx could be palpated subcutaneously. The buck was respiring through the severed trachea directly. The tracheal lumen had only a very few blood clots and were not compromising the capacity of the wind pipe. Based on the findings of physical examination, it was tentatively diagnosed as dog bite induced laryngo-tracheal transection which was later confirmed during at surgery.

Treatment

Animal was stabilized by with Normal saline at the dose rate of 40 ml per Kg body weight intravenously and intramuscular injection of Dexamethasone at the dose rate of 0.2 mg per Kg body weight. Animal was prepared for aseptic surgery and surgery was performed under local analgesia using 2% Lignocaine hydrochloride. The skin wounds noticed on the ventral aspect of neck were joined by incising the skin between them. Sub cutaneous fascia and sternothyrohyoideus muscles were bluntly separated in order to visualize the ends of larynx and trachea. Complete separation of first tracheal ring from the larynx was observed (Fig-2) and laryngotracheal reconstruction was planned. First tracheal ring was attached to cricoid cartilage of larynx by split cartilage technique using No 2-0 catgut by simple interrupted sutures with knots placed outside (Fig-3) and checked for any leakage of air by pouring normal saline around it. The facia and skin were sutured as per the standard procedure (fig-4).

Postoperatively the goat was given, Streptopencillin at the dose rate of 100 mg/10 Kg body weight intramuscular injection for 5 days and Meloxicam at the dose rate of 0.2 mg/Kg body weight intramuscular injection for 3 days besides daily dressing of the wound. Owner was advised to provide rest to the animal besides necessary precautions involving the restriction of extension of neck.

Results and Discussion

Subcutaneous edema was absorbed by 4th post operative day; whereas healing of the skin wound was observed by 10th postoperative day without any complications.

Complete rupture of tracheal attachment with cricoid cartilage of larynx which is noticed in the present case was due to a dog bite. Miles (1999) asserted that, tracheal injuries may result from external trauma during animal fights and automobile accidents. Reports are available on tracheal injuries due to endotracheal intubation in cats (Mitchell et al., 2000). Subcutaneous emphysema at neck region was noticed in the present case further added to the diagnosis of rupture of tracheal attachment with larynx. Similar findings were also reported in cats with tracheal rupture by Mile (1999) and Mitchell et al., (2000). Site of lesion was identified easily in the present case, as there was a gap between the first cartilage of trachea and cricoid cartilage of larynx. Roach and Krahwinkel (2009) advised to pour normal saline at the surgical site to identify the site of rupture. As the site was easily detected in the present case this method was followed to check the integrity of the repaired site.

Trachea was attached to cricoid cartilage by split cartilage technique in the present case. Mutlu et al., (2003) obtained successful results by adopting similar technique for tracheal anastomosis in a dog. Simple interrupted suture pattern applied in the present case for laryngotracheal reconstruction yielded satisfactory results; whereas Nelson, (1993) and Fingland *et al.*, (1995) opined that continuous suture pattern was dominant over simple interrupted pattern in duration of its application and apposition of segments.

Owing to economical status of the owner in the present case, he was advised to roll a cloth surrounding the neck instead of using cervical splints to prevent extension of head and neck. Fingland, (1994) and Lipowitz *et al.*, (1996) opined that, the chances of postoperative complications like edema of larynx and pharynx, laryngeal paralysis, coughing etc. are high following anastomosis of segments of trachea; whereas such complications were not noticed in the present case during an observation period of six months. Finally, surgical reconstruction and proper postoperative care adopted in the present case, ensured good recovery.

Conclusion

Separation of trachea from the larynx was surgically corrected immediately as it is an emergency ailment. The animal was stabilized with fluid therapy and life saving drugs like cortisones before performing anastomosis. Proper surgical treatment besides appropriate postoperative care yielded better outcome in the present case.

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Fig-1: Photograph showing dog bite wounds on the ventral aspect of neck in a goat.



Fig-2: Intraoperative photograph showing gap between trachea and larynx in a goat.



Fig-3: Intraoperative photograph showing anastomosis of trachea to larynx in a goat.



Fig-4: Immediate postoperative photograph showing apposition of skin edges in a goat.