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Case Report

Standing Emergency Tracheostomy in a Buffalo with Acute Airway Obstruction - Case Report

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Abstract

A 6 months old buffalo heifer was presented with the history of high fever and severe respiratory distress for past 8 hours. Owner also reported, the death of one more buffalo calf with the same symptoms yesterday. On clinical examination, animal showed apparent ventral cervical swelling, pyrexia, lacrimation and severe dyspnoea with roaring noise. Based on the above mentioned clinical signs, history, species involved and age of the affected animal, it was tentatively diagnosed as hemorrhagic septicemia induced acute airway obstruction and standing emergency tracheostomy was planned. After infiltration of local anaesthesia, standing emergency tracheostomy was performed with the use of custom prepared polyvinyl chloride endotracheal tube and animal recovered uneventfully after combination of medical and surgical treatment. Blood smear examination revealed characteristic safety pin appearance suggestive of *Pasteurella* sp. The current paper reports the management of acute airway obstruction in a buffalo heifer by standing emergency tracheostomy in combination with medical treatment.

Keywords: Buffalo; Airway Obstruction; Tracheostomy; Hemorrhagic Septicemia; Endotracheal Tube

Abbreviation

PVC: Polyvinyl Chloride

Introduction

Hemorrhagic septicemia is an acute and highly fatal disease of cattle and buffaloes that is caused by specific serotypes of *Pasteurella multocida* . According to OIE, it is classified as a List B disease with the high mortality in untreated cattle and buffaloes [6]. Young adults or older calves of buffaloes are highly susceptible to hemorrhagic septicemia than cattle [2]. Thus, hemorrhagic septicemia is an economically important disease of buffaloes [6]. Diagnosis of hemorrhagic septicemia in field conditions is based on the previous occurrence in the particular area, characteristic clinical signs,

species involved, age of the affected animal, vaccination status and post mortem findings [3]. Outbreaks of hemorrhagic septicemia are usually managed by medical management and vaccination alone. The combination of antibiotic and surgical treatment is rarely used attributed to the limited knowledge on the role of tracheostomy for the management of throat edema in hemorrhagic septicemia [7]. The current paper reports the combination treatment of tracheostomy along with antibiotic therapy as an effective treatment strategy for the successful management of acute airway obstruction due to hemorrhagic septicaemia in a buffalo heifer.

Materials and Methods

Sterile Polyvinyl Chloride (PVC) endotracheal tubes are simple tubes which are placed between the vocal cords to deliver the gases of respiration/anesthesia. In the current report, endotracheal tube cuffed with ID 9 was intraoperatively prepared as per the desired length and used as a tracheostomy tube.

Case Presentation

A 6 months old buffalo heifer was presented to the Referral Veterinary Polyclinic of Indian Veterinary Research Institute, Bareilly with the history of high fever and open mouth breathing with abnormal sound. Owner also reported that, one buffalo calf died with the same symptoms yesterday. Clinical examination revealed elevated rectal temperature of 104.7° F, mucopurulent nasal discharge, severely congested conjunctival mucous membrane, edematous swelling in the pharyngeal and submandibular region, suspended rumination and severe respiratory distress evident by open mouth breathing with roaring noise. Blood smear examination after tracheostomy revealed characteristic appearance of *Pasteurella sp.* Based on the above mentioned findings, it was diagnosed as acute airway obstruction and emergency tracheostomy was performed to reestablish the airway patency.

Treatment protocol

Surgical procedure

Ventral neck region was prepared for aseptic surgery. Without sedation, animal was restrained in a standing position and the head stretched upwards in air just before surgery. A line block on the ventral midline of neck was given by 12 ml of 2% Lignocaine hydrochloride at the middle one third of the ventral neck. A 10 cm incision was made on the ventral midline after mobilizing the trachea by one hand. The medial raphe connecting the paired muscles (sternothyroideus and sterno hyoideus muscle) was incised sharply and blunt dissection was performed to expose the trachea without cutting the muscle belly. Trachea was grabbed in one hand and the annular ligament in between two tracheal rings was incised to create a vent in trachea. A sterile and pre prepared (just before surgery, a desired length of the endotracheal tube was cut to mimic the commercially available silicone tracheostomy tubes) polyvinyl chloride endotracheal tube with 9 ID was inserted into the trachea and secured by sutures along with the skin margins (Figure 1).

Figure 1: Custom prepared PVC endotracheal tube secured to skin.

Post-operative care

Post operatively, animal received Inj. Ceftriaxone tazobactum @ 10 mg/kg intravenously for seven days , Inj. Meloxicam @ 0.5 mg/kg intramuscularly for 5 days, Inj. Chlorpheniramine maleate @ 0.5 mg/kg intramuscularly for 5 days, Inj. Frusemide @ 1mg/kg Intramuscularly for two days and Inj. Prednisolone acetate @ 0.5 mg/kg intramuscularly for two days. The tracheostomy tube was checked twice daily for any blockade and cleaned with sterile saline solution.

Results and Discussion

The tracheostomy tube was removed on 3rd post operative day as the acute signs of respiratory distress had subsided. Following the debridement of skin edges, cross mattress skin sutures were

applied with non absorbable polyamide and sutures were removed after 10 days. Animal recovered uneventfully after a combination of surgical treatment with available material and medical management (Figure 2).

Figure 2: Buffalo heifer without respiratory distress after tracheostomy.

Gasping animals with open mouth breathing has to be considered as an respiratory emergency that needs emergency surgical and medical interventions due to limited availability of time [7]. Hemorrhagic septicemia in buffaloes occurs as acute, sub-acute and chronic forms that is characterized by a phase of pyrexia (often unnoticed), a phase of respiratory system involvement and a terminal septicemia phase that may lead to death [2]. The subcutaneous edematous form (sub-acute form) of hemorrhagic septicemia is the most common respiratory emergency that warrants emergency tracheostomy due to the transient blockade of larynx and trachea by edematous swelling which is often non responsive to medical management [9]. Other indications for emergency tracheostomy in bovines includes, pharyngeal or laryngeal obstruction [5], necrotic laryngobacillosis in calves which is non responsive to antibiotic and anti inflammatory therapy [8], as a conservative management before the surgical removal of an obstructive lesions (neoplasm or abscess or granuloma) of the upper airways [4], roaring in animals due to narrowing of the upper airways [5] and as a part of treatment for hemorrhagic septicemia [9]. Reported success rate in hemorrhagic septicemia infected buffaloes with acute airway obstruction, treated by tracheostomy in combination with antibiotics was 25% out 15 buffaloes [5] and 79% out of 33 buffaloes which is higher than the reported success rate of medical treatment alone [9]. Thus, combination therapy is superior over medical treatment alone.

Lateral recumbency and sedation can aggravate the existing respiratory distress in bovines [1]. Therefore, standing tracheostomy in local anaesthesia is advantageous over the tracheostomy in lateral recumbency with or without sedation in dyspnoeic animals. Standing emergency tracheostomy in bovines can be performed in normal standing position with the head stretched up in the air by nose tongue or halters. However, this upward stretching of head will worsen the dyspnea. Therefore, it is recommended to perform all preoperative preparations in the normal anatomical position of the head, and just prior to surgery, head of the animal should be stretched upwards in air [5].

Commercially available silicone tracheostomy tubes with or without cuffs, stainless steel tracheostomy tubes, human tracheostomy tubes and stainless steel self retaining tracheostomy tubes can be used in veterinary patients. Major complications associated with these tubes includes cost and blockade of tubes by respiratory tract secretions attributed to its tubular design [5]. Polyvinyl chloride endotracheal tubes are readily available, sterile and comparatively cheaper than the commercially available tracheostomy tubes. Therefore, PVC endotracheal tubes have to be custom prepared by cutting a desired length of the endotracheal tube (Figure 3) which can be secured to the skin margins by sutures. PVC endotracheal tubes are also susceptible to obstruction which mandates it's regular cleaning.

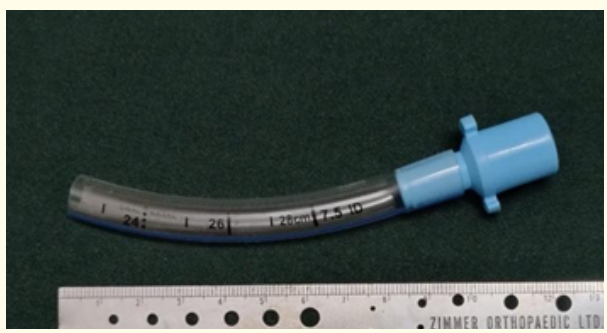

Figure 3: Custom prepared PVC endotracheal tube with 7.5 ID (example).

Fatal complications like death can occur due to the tube blockade or in inflated cuff. Leaving the cuff in deflated condition permits the animal continue to breath around the tube even after occlusion of the tubular lumen. If the tube is not secured with skin properly, animal may cough the tube out of the tracheal lumen and invariably leads to respiratory distress. Pneumomediastinum, pneumothorax, bronchopneumonia, necrotic tracheitis and surgical site tracheal stenosis can also happen as a consequence to temporary tracheostomy (5). Factors that determines the outcome of emergency tracheostomy are type of the emergency condition, time at which tracheostomy is performed, position of the animal during tracheostomy, site of tracheostomy incision, degree of soft tissue damage, type of the tube used, postoperative care of the tube and other treatments given.

Conclusion

In the present report, we performed a standing emergency tracheostomy to avoid the respiratory distress associated with lateral recumbency. Custom prepared PVC endotracheal tube ID 9 is used instead of the commercially available tubes, because it is sterile, readily available and cost effective. Thus, standing emergency tracheostomy with custom prepared PVC endotracheal tube of appropriate diameter can be used for the successful management of acute airway obstruction caused by hemorrhagic septicemia in buffalo calves.

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Conflict of interest

Authors don't have any conflict of interest.

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