CASE REPORT
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MULTIMODAL BALANCED GENERAL ANAESTHESIA IN A BUFFALO CALF FOR THE REMOVAL OF FISH HOOK FROM THE ORAL CAVITY

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ABSTRACT

A one year old male buffalo calf was presented to the Department of Veterinary Surgery and Radiology with the history of dysphagia and hypersalivation over a period of two days. As the animal resisted physical examination of the oral cavity, on radiographic examination, a radio opaque fish hook shaped object was observed inside the oral cavity. Under multimodal general anaesthesia using butorphanol-xylazine-ketamine premedication and guaiphenesin-ketamine continuous rate infusion, a fish hook along with a piece of nylon thread was removed successfully from the oral cavity and the animal made an uneventful recovery.

Keywords: Multimodal balanced general anaesthesia, fish hook, foreign body, guaiphenesin, ketamine

INTRODUCTION

Foreign body lodgement in the oral cavity of large ruminants is not common. Syam et al. (2002) reported a case of posteriorly migrating metallic foreign body from the pharynx of a cow and subsequent abscess formation. When present, they pose significant clinical challenges due to anatomical constraints, behavioural resistance, and the risk of aspiration or haemorrhage during intervention. Among these, accidental ingestion and subsequent lodgement of metallic objects such as fish hook demands prompt and controlled surgical management.

In such cases, multimodal general anaesthesia provides a balanced and synergistic approach by combining agents that target different components of the anaesthetic triad (analgesia, sedation, and muscle relaxation) while minimising individual drug doses and adverse effects. According to Kumar et al. (2013), Multimodal anaesthesia enhances safety and efficacy by synergistically balancing cardiovascular stability, analgesia, and

sedation. This approach is particularly beneficial in bovine practice, where maintaining airway reflexes and minimising stress responses are critical.

This report details the successful anaesthetic management in a buffalo calf using multimodal balanced general anaesthesia protocol for the removal of a fish hook lodged in the root of tongue behind the torus linguae, highlighting the clinical utility and pharmacological synergy of this approach in large animal surgical practice.

ANAMNESIS AND OBSERVATIONS

A one-year-old male buffalo calf, weighing about 200kg was presented to the Department of Veterinary Surgery and Radiology with a complaint of dysphagia and excessive salivation for two days. On observation, the buffalo was dull and depressed. The vital parameters such as rectal temperature, heart rate, respiratory rate and rumen motility were within normal physiological limits. On radiographic examination, a radio opaque, fish hook shaped object was observed inside the oral cavity.

TREATMENT AND DISCUSSION

Manual removal of the foreign body from the oral cavity was proposed under general anaesthesia using a multimodal protocol. The calf was premedicated with

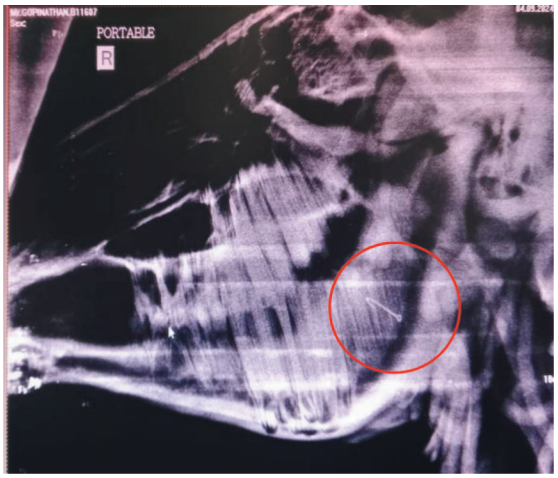

Fig. 1 Radiographic image of the fish hook in the oral cavity of the buffalo calf

a combination of inj. butorphanol, inj. xylazine and inj. ketamine intramuscularly, at the dose rate of 0.01 mg/kg, 0.02 mg/kg and 0.04 mg/kg body weight respectively. After achieving adequate sedation, animal was controlled in left lateral recumbency on the operation table and anaesthesia was induced with slow intravenous administration of 1:50 (w/w) ketamine-guaiphenesin combination as double drip at the dose rate of 2.0 ml/kg body weight, to effect. After achieving adequate muscle relaxation, the jaw was opened without any resistance and upon exploration of the oral cavity, a fish hook with a nylon thread attached to it was palpable at the root of the tongue behind the lingual prominence, the torus linguae. The fish hook was carefully manipulated and dislodged from the root of the tongue without any complication. The subsequent mild bleeding was controlled by applying digital pressure. The oral

cavity was irrigated with potassium permanganate (1:5000) solution. The animal had a smooth induction and recovery from anaesthesia and the total duration of anaesthesia was sixty-five minutes which was sufficient for the completion of the procedure. Postoperatively, inj. meloxicam at the dose rate of 0.2 mg/kg body weight was administered intramuscularly for two days and the animal had a smooth recovery thereafter.

Ruminants are not ideal candidates for general anaesthesia due to the higher risk of regurgitation and subsequent aspiration of ruminal contents when compared to other monogastric animals. Their calm nature makes it possible to perform most surgeries under local anaesthesia, with or without mild sedation, and a variety of techniques are available for this. However, certain important procedures like exploration of the oral cavity are better performed under general anaesthesia, and with appropriate precautions, it can be administered safely and effectively (Mulon, 2019).

Fig. 2. Removal of fish hook from the mouth

Multimodal general anaesthesia could be achieved by using a mixture of different categories of drugs like sedatives, analgesics and muscle relaxants which produced the desired anaesthetic effect. This method allowed for smaller doses of each medication compared to using them individually, as noted by Hendrickx et al. (2008). Additionally, it enhanced the effectiveness of the drugs while minimising their potential side effects.

A good preanesthetic sedation facilitated smooth induction and has an anaesthetic sparing effect during maintenance. Butorphanol-xylazine-ketamine (BXK) combination is most commonly used as pre-anaesthetic medication to sedate bovines prior to examination or surgery and it provided better restraint and analgesia. The duration of sedation varied depending on the dose and route of administration. The onset of sedation may be delayed, but the effect will last about 30 minutes on intramuscular administration of BXK (Hymavathi, 2023). Ketamine, a widely used dissociative anaesthetic, induces mild cardiovascular stimulation while preserving swallowing

and cough reflexes, but offers limited muscle relaxation when administered alone (Thavardas et al., 2022). To enhance muscle relaxation, guaifenesin, a centrally acting muscle relaxant is commonly combined with ketamine which causes minimal cardiopulmonary depression (Stegmann, 1998). It is not recommended as a sole agent because it produced little or no analgesia. When used in combination with ketamine, induction quality is improved and a lower volume of anaesthetic agent is required. Guaiphenesin 5% along with ketamine (1mg/ml) is known as double drip solution. It could be given as an intravenous drip "to effect" for induction and administered intermittently or as continuous rate infusion at the dose rate of 0.5-2ml/kg/hr (Saranya et al., 2021). The anaesthetic induction using guaiphenesin and ketamine combination was smooth and uneventful. There was complete relaxation of jaw muscles which allowed oral cavity examination easier. The recovery of the animal from anaesthesia was smooth and uneventful. Multimodal anaesthesia using appropriate premedication helped to surpass the initial stages of anaesthesia, which resulted in smooth induction and uneventful recovery (Souljai, 2021).

SUMMARY

A one-year-old male buffalo calf with a fish hook lodged at the root of tongue behind the torus linguae was treated successfully under multimodal general anaesthesia using butorphanol-xylazine-ketamine combination as pre-anaesthesia and guaiphenesin-ketamine combination for induction and maintenance of anaesthesia.

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