

Fistulation and Cannulation of the Rumen in Buffaloes: Comparison of Two Methods

Case Study

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Abstract

Two surgical methods were compared for rumen fistulation and cannulation in 8 buffaloes. A permanent fistula was created in left paralumbar by two-stage surgery. In 4 animals, the muscles were incised along the skin edges in circular fashion and removed and in another 4 animals, the muscles were separated along the muscle fibre (grid). Suturing muscles with skin and rumen wall with muscles prevented postoperative complications. The cannula remained functional for long periods in grid technique.

Keywords: Rumen Fistulation; Cannulation; Buffalo; Grid Technique.

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Introduction

Rumen fistulas are widely used in ruminant digestive research. Two surgical procedures for the ruminal fistulation and cannulation has been described. The first technique described by Schalk and Amadon (1928) [10] as one stage procedure and later a new technique in two stages was described by Jarret (1948) [5]. The ideal fistula is one that forms a seal around the cannula, preventing the leakage of the experimental period. In this study, two-stage technique was done in two different ways with the intention to compare and find out which one is better to reduce postoperative necrosis of the wound edges and consequent loosening of cannula and other complications.

Materials and Methods

Buffaloes presented to the polyclinic IVRI, Izatnagar, for rumen fistulation and cannulation by the Department of Nutrition, were taken for the surgery. The animals were prepared for surgery under local anaesthesia. The skin was marked with an indelible

marker along the circumference of the cannula to be used. Cruciate incision was made through the skin and the pieces of skin were undermined and removed along the marking. The muscles were cut by two different ways in two groups, each consisting of four animals. In one group, the muscles were incised along the skin edges in circular fashion and removed. In the second group, the muscles were separated along the muscle fibre direction by division. The abdominal wall muscles were sutured with skin with silk to retract the muscles thereby giving a regular circular shape to the hole for ease at the time insertion of cannula. Sufficient portion of the rumen wall was seized and pulled through the abdominal incision, exposing part of the rumen wall. The exposed portion of the rumen was sutured to the peritoneum around the surgical opening; using chrome catgut No. 1 in simple continuous pattern. Post-surgery, gauze was fixed to cover the rumen wall and dressed regularly. Antibiotics and analgesics were administered for 5 days. After fifteen days the exposed rumen wall was incised and the cannula was fixed.

Results and Discussion

There are various complications associated with rumen fistulation and cannulation, like loosening of the cannula, increases in size of the fistula by necrosis of the tissue or ruminal fluid leak [6]. The leakage of large amounts of ruminal contents can take the animal to dehydration and malnutrition [4]. Moreover, the ruminal fluid causes extravasation injuries to the skin, produces an unpleasant odour and enhances the appearance of myiasis. Peritonitis is reported as one of the serious complications arising from the rumen cannulation [1, 8] but in the current study we did not observe any clinical case of peritonitis. The absence of cases of peritonitis may be due to the suturing of peritoneum and muscles with the rumen wall allowing adhesions formation and thus preventing leakage of rumen contents into peritoneal cavity. Perfect apposition of skin with underlying muscles promoted by sutures prevented the formation of subcutaneous emphysema. [2, 7].

In the animals in which grid technique was used, it was difficult to insert cannula on the 15th day. In few animals a small nick in the muscles of abdomen was required to insert the cannula. There was loosening of cannula after few days of fixation in those animals in which circular portion of the muscle was removed. In two of such cases cannula was repeatedly falling into the rumen. There was no loosening of cannula observed in any animals in which grid incision was given in the muscles. Divulsion towards the muscle fibers, providing an opening muscle "grid", prevented loosening of the cannula. After cannula implantation, the muscles acted as a sphincter, compressing and retaining the cannula in the abdominal opening. This technique also assisted in forming a tight seal around the cannula thereby decreasing the leakage of rumen contents [3, 9].

The surgical technique involving divulsion of muscles for creating rumen fistula and deployment of cannula was better and with minimal postoperative complications. Suturing muscles with skin and rumen wall with muscles prevents complications like peritonitis, subcutaneous emphysema etc.

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