

Surgical resection of type II rectal prolapse in a cow

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Abstract

Type – II prolapsed rectum is protrusion of one or more layers of the rectum through the anus. Stairstep amputation and subsequent anastomosis of severely devitalized Type – II prolapsed rectal mass was performed with a slight deviation from already established methodology where instead of inserting traditional crosspin fixation with two hypodermic needles, two strong catgut threads were passed through the prolapsed mass in order to stabilize the prolapsed rectum during the suturing procedure. Surgery was performed under Caudal Epidural Anesthesia where a mixture of xylazine hydrochloride and lidocaine was used to achieve longer duration of anesthesia and analgesia.

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Introduction

Rectal prolapse is a protrusion of one or more layers of the rectum through the anus (Ettinger and Feldman, 1995). It is subdivided into either complete or incomplete rectal prolapse, depending on whether it involves all layers of the rectum or just the rectal mucosa (Anderson and Miesner, 2008). It is the most common surgical affection involving the rectum of cattle. The condition may be a result of prolonged tenesmus or increased intra-abdominal pressure due to bloat, trauma, colitis, proctitis, diarrhea, act of parturition, dystocia, intestinal parasitism, tail docking. Other causes of straining include intestinal neoplasia, foreign bodies, perineal hernia, constipation, congenital defects, lower urinary tract and prostatic diseases (Levine, 1978; Turner, 1980; Rick, 1989; Welker, 1991; Andrews and Jones, 1992; Tyagi and Singh, 1993; Johnston, 1985; Sherding, 1996; Shakespeare, 2000; Thomas *et al.*, 2003; Kumar *et al.*, 2004; Marjani *et al.*, 2009).

Prolapse of bowel or mucosa through the anus of the animal has been categorized into four types. In a type I rectal prolapse, only the rectal mucosa and submucosa project through the anus. A type II lesion represents a complete prolapse of the full thickness of all or part of the rectal ampulla. Type I and II prolapses are the most common. In a type III prolapse, a variable amount of small colon intussuscepts into the rectum in addition to a type II prolapse. In a type IV prolapse, the

peritoneal rectum and a variable length of the small colon form intussusceptions through the anus (Turner, 1980; Turner, 1987; O'Conner, 2005).

History and Clinical Observations

A 9 years old non-descriptive cow in good health weighing about 400 kg was showing sign of recurrent cervico-vaginal prolapse since last 3 months following calving. Hitherto the prolapsed mass was reduced and retained by application of Bühner sutures for 2 - 3 times with courses of antibiotics and progesterone injections. But due to constant irritation and straining, this time there was cervico-vaginal prolapse accompanied with rectal prolapse (Fig. 1). The religious constraints of the owner prevented the cow to be disposed off for slaughter. Therefore, the animal was presented to Teaching Veterinary Clinical Complex (T.V.C.C.) of M.J.F. College of Veterinary and Animal Science, RAJUVAS, Chomu, Rajasthan on 26th June 2013 and as per the owner's request the cow was approached for necessary surgical interventions.

Clinically, a rectal prolapse appears as a pink to red rosette-like structure protruding from the anus. Initial examination of the cow revealed cervico-vaginal prolapse and rectal prolapse with severe oedema and partial necrosis of the exposed tissues. Approximately 12 cm long Type II prolapse of the rectal tissue, with

the mucosal and submucosal layers severely soiled, traumatized and edematous, was confirmed. The anal sphincter tonicity was extremely poor, and the muscles of the tail were flaccid.

Treatment and Discussion

Before initiation of surgical intervention, caudal epidural anaesthesia was performed to reduce straining. Instead of traditional low dose epidural anaesthesia i.e., 2% lidocaine at a dose rate of 0.2 mg/kg (1 ml/100 kg); Xylazine in combination with lidocaine was given to achieve a longer lasting anaesthetic effect. The dose of the Xylazine in this mixture was at the rate of 0.03-0.05 mg/kg made up to 5 ml with 2% lidocaine (in this case 1ml of Xylaxin®, Indian Immunologicals Ltd and 4 ml of Xylacaine®, Astra Zeneca). Onset of anaesthesia was within five minutes and the duration of anaesthesia lasted up to six hours. The use of Xylazine as an epidural anaesthetic not only gives longer anaesthesia, but also gives mild to moderate sedation of the animal as well as mild ataxia with an increased risk of recumbency, decreased ruminal motility and bradycardia (Beltman *et al.*, 2010).

After proper cleaning with luke warm 2% potassium permanganate solution and liberal lubrication, with acriflavine – glycerine - lidocaine jelly (Astra Zeneca), both the prolapsed tissues were reduced manually and held in position for 20 minutes. Thereafter the animal was administered with Streptomycin + Penicillin (10 gram of Dicrysticin – DS®, Zydus AHL) intramuscularly and a non-steroidal anti-inflammatory drug (15 ml of Meloxicam®, Intas Pharmaceuticals) intramuscularly. By the following morning only the rectum had prolapsed again. Although the animal was straining continuously, there was no prolapse of vagina and cervix.

In addition to vascular compromise resulting from constriction due to tight anal sphincter, the prolapsed rectum was further subjected to soiling, contamination and trauma. Hence resection of the prolapsed mass was advised as it was heavily devitalized and too much tissue was involved to allow manual reduction and subsequent retention. Although several techniques of prolapsed rectum amputation have been described and accepted like submucosal resection (Johnson, 1943), rectal ring method, stair step amputation (Welker and Modransky, 1992; Freeman, 1999; Fubini and Duchrame, 2004; Weaver *et al.*, 2005), delorme's operation (Delorme, 1900; Monson *et al.*, 1986; Abulafi *et al.*, 1990; Christiansen and Kirkegaard, 1981) and popular transabdominal procedures namely Ivalon® sponge (Morgan, *et al.*, 1972; Penfold and Hawley, 1972), Marlex® mesh (Keighley, *et al.*, 1983), Ripstein (Ripstein, 1972),

perineal surgical repair (Nay and Blair, 1972), prophylactic colcopexy (Popovitch *et al.*, 1994; Sherding, 1996) and extended abdominal rectopexy (Mann and Hoffman, 1988). But in this clinical case it was a unanimous decision to perform stair step amputation and anastomosis because the tendency for stricture formation was to keep minimal.

Before commencement of surgery, aforementioned anesthetic protocol was repeated. The rectum was pulled posteriorly as much as possible followed by putting plastic syringe casing/tubing (with the nozzle removed) into lumen of rectum. Instead of inserting traditional crosspin fixation with two hypodermic needles; two strong catgut threads (Ethicon® chromic catgut no. 2) were passed through the prolapsed mass and tubing close to the anal opening, one vertically and the other horizontally, to stabilize the prolapsed rectum during suturing procedure. A full thickness circumferential incision was made just distal to the catgut sutures. Approximately a fifth of the prolapsed tissue circumference was resected and anastomosed sequentially. The rectal arteries and veins were clamped with hemostats and tied off as they were found. After complete circumferential resection, the two catgut threads were cut in the centre and pulled them out a little through the lumen and thus four interrupted pieces of catgut passing through the full thickness rectal wall were obtained. Interspaced mucosal edges, between four interrupted pieces of catgut, were then apposed in a simple-continuous pattern with 2/0 chromic catgut (Ethicon®) around the circumference.

Normal saline (3 litres) and Ringer's Lactate (3 litres) were injected intravenously during the operation. Haemostyptic Adrenochrome Monosemi Carbazone (5ml of Adchrome®, G. Loucatos & Co. intramuscular) was administered perioperatively to minimize hemorrhage. Streptomycin + Penicillin (5 gram of Dicrysticin – DS®, Zydus AHL intramuscular) was given twice daily for a period of 6 days intramuscularly. Meloxicam 10ml (Meloxicam®, Intas Pharmaceuticals) intramuscular was given once daily for a period of 3 days. The site was applied with fly repellent preparations and kept under a cloth cover. The animal was kept on an inclined platform with the hindquarters elevated in order to reduce pressure on the suture line from the risk of straining. Anal area was lubricated with lidocaine jelly mixed in an antibiotic ointment namely Sofradex® cream (framycetin sulphate 1% w/w, dexamethasone acetate 0.1 % w/w, Sanofi Aventis). The patient was kept on easily digestible green fodder. Careful digital removal of faeces from rectum was also tried.

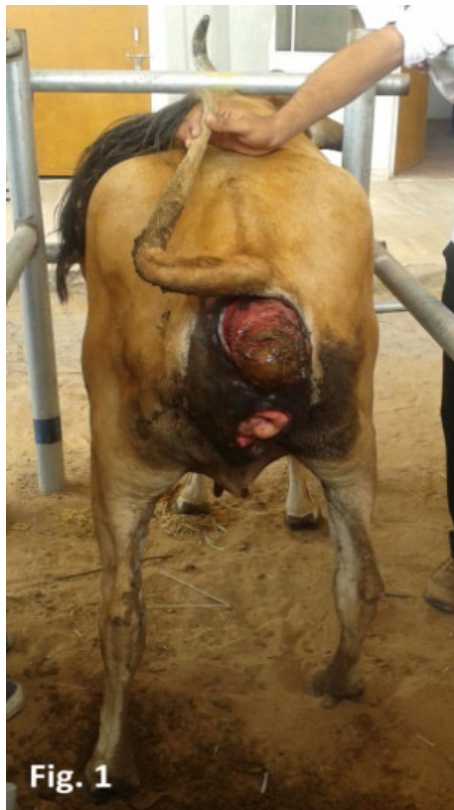


Fig. 1

Fig 1: Rectal prolapse (Type II) together with cervico-vaginal prolapse and continuous abdominal straining on the first day.



Fig. 2

Fig 2: Moment after Stair-step amputation of prolapsed rectal mass.

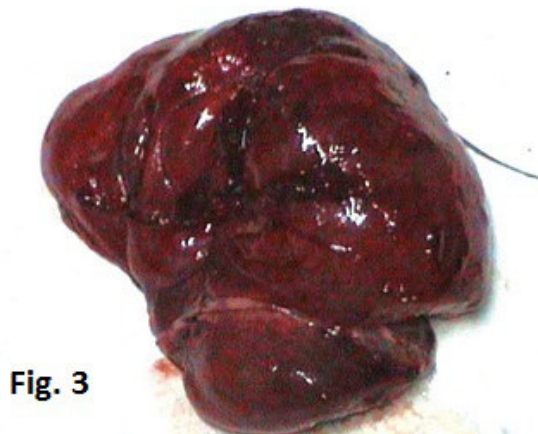


Fig. 3

Fig 3: Resected prolapsed rectum

The cow had an uneventful recovery with normal appetite and defecation during an observation period of 40 days post-operation.

The Stair step rectal prolapse amputation was performed as described in the horse by Freeman, 1999 and in the cattle by Welker and Modransky, 1992; Fubini and Duchrame, 2004; Weaver, Steiner and St Jean, 2005 i.e., resecting 1/5th of the diameter of the compromised tissue at a time, directly followed by anastomosis of the resected portion. But instead of crosspin fixation with two hypodermic needles, as described in aforementioned established methodology, we had used two strong catgut threads crossing each other at 90° in order to stabilize the prolapsed mass during suturing. This procedure was lengthy owing to the presence of numerous large rectal and anal vessels that required ligation. Although electro-coagulation might have hastened the procedure but the diameters of most of the vessels were too large for electro-coagulation. Immediate resection of all tissues followed by ligation of vessels may have shortened surgical time. This option was not pursued, as the vessels tended to retract cranially and searching for them after resection would most likely have prolonged the surgical time rather than shortened it.

Submucosal resection (Johnson, 1943) is the preferred technique if the prolapsed mucosa is necrotic, ulcerated, or traumatized, but the underlying tissue is healthy. Therefore it could not be considered for

correction of prolapsed organ due to the presence of devitalized tissue not only at the exposed portion but also the underlying tissue. Delorme's operation (Delorme, 1900; Christiansen and Kirkegaard, 1981; Monson *et al.*, 1986; Abulafi *et al.*, 1990) also could not be considered for correction of prolapsed mass because it involves stripping of exposed mucosa only and residual mass is reduced in to a doughnut shaped mass by insertion of placating suture. But in this clinical case all the layers of the prolapsed rectum was compromised severely, therefore rendered unfit for retention. Rest of the approaches is difficult due to involvement of major abdominal procedures. At the time of initial examination of the cow, when the poor tail and anal tone were noted, these deficits were assumed to be the result of the immobilizing agents. While the exact cause of the neurological deficit to the anus and caudal rectum and resulting rectal prolapse is not clear. Most mammals have increased plasma oestrogen and/or relaxin concentrations for a few weeks preceding parturition, and this was considered to be a factor that might have contributed to the amplification of pelvic muscle and ligament laxity, resulting in the rectal prolapse (Jainudeen and Hafez, 2000). Increased intra-abdominal pressure brought about by the rapidly expanding uterus, rather than endocrine factors, are thus more likely to have precipitated the prolapse through the compromised anal sphincter.

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