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Surgical Correction of Rectal Diverticulaum through Lateral Resection in Canines

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ABSTRACT: Perineal hernia is common in old uncastrated male dogs. The common hernial contents in perineal hernia in male dogs are urinary bladder, prostrate, perineal fat and rectum. The present paper describes the successful repair of rectal iverticulum in aged male dogs. Rectal diverticulum is corrected by lateral resection technique and the perineal hernia was repaired by rotation of obturator muscle.

KEY WORDS: Rectal diverticulum, Perineal hernia, Contrast radiography, male dogs

INTRODUCTION

Perineal hernia is common in old uncastrated male dogs. These hernias are due to alterations of the pelvic diaphragm. The weakness of the pelvic diaphragmatic muscles such as levator ani and lateral coccygeus muscles arises from increased tenesmus associated with gonadal hormonal imbalances, rectal abnormalities, prolonged constipation, chronic prostatic disease or myopathy which may contribute to the formation of perineal hernia (Ninu *et al.*, 2024). The weakness of the pelvic diaphragm in turn may cause loss of support to the rectal wall causing a rectal diverticulum, indicated by swelling at the perineal region leading to persistent rectal distension and impaired defecation (Fossum *et al* .,2018). The common hernial contents in perineal hernia in male dogs are urinary bladder, prostrate, perineal fat and rectum (Gill and Barstad, 2018). Nanoboina *et al.,* 2018 opined that persistent pushing of faeces against the rectal wall makes it weak and stretched causing bulging and pocket formation which ultimately turns into sacculated layer diverticulum (asymmetricl enlargement of rectal diameter and disruption of muscularis layer of rectum followed by protrusion of rectal mucosa through seromuscular layer of rectal wall). Some factors such as obesity, constipation and fecaloma are associated with the presence of rectal diverticula (Motta *et al.,* 2012).

The disease is diagnosed based on history, clinical signs, physical examination and radiographic findings. Rectal palpation is the most important step in physical examination. A per-rectal examination reveals impacted fecal masses in a diverticulum which was confirmed on radiography. Feces are removed manually and the index finger is used to verify the existence and degree of anomaly, such as rectal deviations, sacculation's and diverticula, as well as to classify the degree of atrophy/pelvic diaphragm muscle separation and dimension / location of prostrate. Survey radiographs plain and contrast techniques should be performed to assess the extension of rectal dilatation. It has been known that without efficient repair of the diverticulum, neither conservative treatment for classical herniorrhaphy techniques would be successful.

Case presentation, clinical signs and diagnosis

The present paper describes the successful repair of rectal diverticula in a 14 year old male spitz dog weighing 8kg, and a 5 year old German shepherd dog weighing around 32 kg which were presented to the Department of Veterinary clinical complex, college of veterinary science, Tirupati with a history of perineal swelling on left side since four months and two months respectively. Spitz dog was intact male whereas the German Shepheard dog was castrated. Both the dogs were fed with home food and housed inside. Chronic constipation, tenesmus and dyschezia for the past 2- 4 months was the main complaint and there was no history of previous trauma or surgery in both the dogs. The perineal swelling was warm, soft and painful(Fig 1). Digital rectal examination identified a weakness in the left pelvic diaphragm and feces filled sac with in the lateral wall of rectum. The rectal temperature, pulse rate and respiratory rate were within normal ranges. The preoperative laboratory examination (complete blood count and

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serum chemistry) was normal in both the cases. The ventro-dorsal projection was also taken to observe the sacculation and rectal flexures (Fig 2). The plain lateral radiograph of caudal abdominal region revealed a gas filled sac in perinea, characterized by an external and intact pouch on the rectal wall indicating rectal dilatation. Positive contrast radiographic study was achieved by administering barium sulphate through an inflatable cuffed catheter placed in very distal rectum and filled by gravity using a volume varying from 7 to 15ml/kg bwt. The sacculation at left side outlined by barium, confirmed the rectal diverticulum (Fig 3). With the confirmative diagnosis of rectal diverticulum and perineal hernia, by physical examination and positive contrast radiography, diverticulectomy using lateral approach and herniorrhaphy were scheduled.

Surgical correction:

The dogs were kept on Syrup Cremaffin for easy expulsion of feces on the day before surgery. Enema was given to both the animals prior to surgery inorder to avoid the contamination of surgical site. After proper preparation, the dogs were pre-anaesthetized with atropine @ 0.02mg.kwt. General anaesthetic induction was done with Ketamine and Midazolam @ 5mg and 0.1mg/kwt respectively followed by endotracheal intubation and maintained with 1.8-2% Isoflurane. The animals were positioned in sternal recumbency with e perineal region in elevated position. A Curvilinear skin incision was taken 1 to 3cm lateral to anus beginning dorsal to tail head and extending ventral to the anus. After dissection of the subcutaneous tissue, the hernial contents are reduced and kept in position using gauge sponges. The rectum and rectal sacculation were identified through digital palpation (Fig4). The sacculation is retracted and clamped with atraumatic intestinal forceps taking care to protect the rectal lumen (Fig5). Subsequently, an inverting cushion absorbable suture was placed passing through all the intestinal layers, dislocating the forceps as the suture progresses. After suturing, the clamped intestinal portion corresponding to the sacculation was resected. Rectal wall sutured in two layers carefully (Fig 6).

During herniorrhaphy, the first sutures were placed from the internal obturator muscle ventrolaterally to the external anal spincter medially, and then from the sacro tuberous ligament, the coccygeal muscle and the levator ani muscle laterally to the external anal spincter medially. Sub cutaneous tissues and skin were closed routinely. Post operatively the dog was administered on inj Cefotaxime @ 20mg/kgwt Bid, inj Meloxicam @ 0.2 mg.kwt Sid and Syp Cremaffin as a laxative to avoid staining during defecation. Both dogs improved gradually and there was no recurrence for two months post surgery. As the diet plays a major role in preventing diverticular disease, a high fiber diet with a focus on whole grains, fruits and vegetables was advised to decrease the likelihood of symptomatic diverticulitis.

DISCUSSION

Rectal diverticulum is often a chronic condition accompanied by perineal hernia and the clinical signs may include constipation, obstipation, dyschezia, tenesmus, rectal prolapse, stranguria or anuria. The definitive diagnosis of perineal hernia is based on clinical signs and findings of weak pelvic diaphragm musculature during a per-rectal examination. Hosgood *et al.,* (1995) investigated rectal abnormalities in 30 dogs and recorded rectal diverticulum in 12 dogs.

In our case, the possible cause of rectal diverticulum was that the animal was fed with red meat without fiber content that led to recurrent fecal impaction and exerted pressure caused distension of the rectum. During chronic episodes of constipation, overzealous digital evacuation had weakened the rectal wall with subsequent diverticulum formation. Vnuk, (2008) and Krahwinkel (1983) have reported that old dogs enduring rectal diverticula, deviation and sacculation also suffer from perineal hernia. Our findings are in accordance with Krahwinkel (1983) who concluded that reoccurrence of rectal disease is a consequence of perineal hernia which develops initially.

Maji *et al*. (2012) successfully operated bilateral rectal diverticulum in a German Shepheard Dog by pull-through-technique i.e., resection and reapposition was done via anal approach as there was no accompanying perineal hernia in this dog. Pekcan *et al,* (2010) used a method of reverse U technique or plication (closed inversion of the rectum by inversion sutures) to reduce the size of rectal diverticula as this technique decreased surgical contamination. On Contrary, Vnuk *et al.* (2008) opined that plication technique may result in rectal prolapse, suture sinuses and seroma formation after the operation. Anal splitting and resection of the segment of intestine with end-to-end anastomosis have also been described by Vnuk *et al.* (2008), but are challenging and associated with morbidity. Basavanagowda *et al*. (2010) excised the diverticulum in a 8 year old male intact Doberman dog, and reopposed it to the healthy rectum using a anal approach and suggested that this approach is suitable for the lesions involving the caudal rectum. Vunk *et al.* (2008) suggested divericulotomy and lateral resection. In our present clinical cases also, diverticulectomy by lateral approach

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and perineal herniorrhaphy produced excellent results and none of the cases showed reoccurrence for the period of six months under observation.

Additional techniques include use of grafts like autologous tunica vaginalis, small intestinal sub mucosa allograft, bovine pericardium superficial gluteal and semitendinosus muscle transposition, in addition to the use of synthetic implants for perineal herniorrhaphy (Guerius *et al.,* 2020). Animals with diagnosis of rectal diverticulum concomitant to perineal hernia and subjected to the technique described here did not exhibit reoccurrence since the causes of tenesmus and dyschezia were definitively corrected.

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CONCLUSION

Overall success rate and client satisfaction makes the lateral resection technique, a preferable procedure in dogs presented with rectal diverticulum associated with perineal hernia.

Figures

Fig 1. Castrated male dog with a history of dyschezia, tenesmus

Fig 2 & 3. Radiographic examination: lateral deviation with outpouching of left rectal wall with barium enema

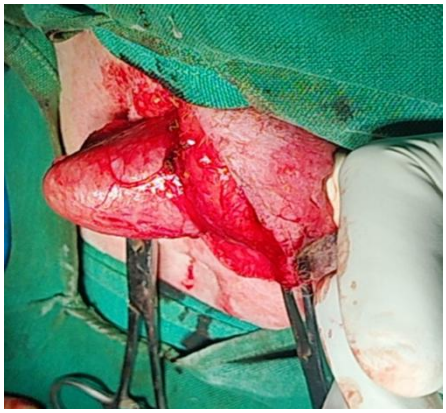

Fig 4. Rectal diverticulum was confirmed by rectal digital palpation

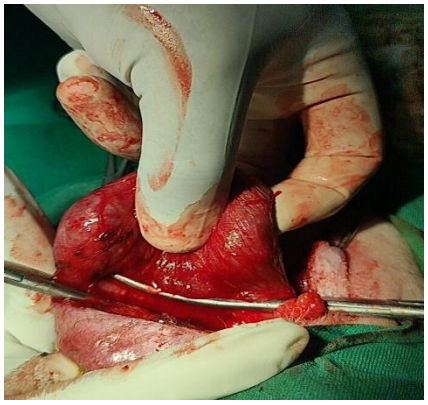

Fig 5. Rectal diverticulum clamped with haemostatic forceps and resected

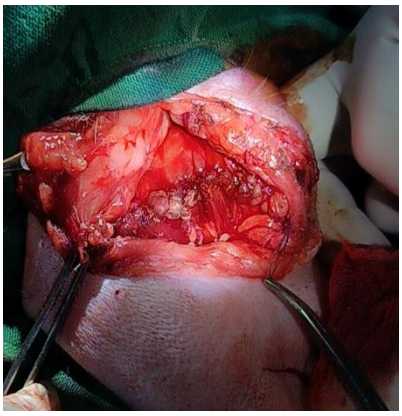

Fig 6. Rectal wall sutured in two layers carefully, removed the forceps as suture progresses

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