

Surgical Management of Caudal Rectal Tumors in Buffaloes

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Abstract: This study aimed to clarify the effect of surgical excision of caudal rectal tumors via an anal approach in buffaloes and to report the outcome. Total 7 buffaloes were clinically examined. Caudal epidural anaesthesia was performed. The rectum was partially prolapsed and stabilized. Surgical excision was performed 1 cm rostral to the mass in the grossly apparent rectal tissue. The mucosa was apposed with continuous horizontal mattress suture using polydioxanone. The operated animals were followed up for 8 months. Each female buffalo had only one tumor type (Fibrosarcoma [1], Fibroma [2], Leiomyoma [2], Plexiform haemangioma [1] and Myxoma [1]). Healing was achieved without regrowth of the masses. Caudal rectal tumors in buffaloes could be excised with excellent outcome via an anal approach facilitated by partial rectal prolapse.

Key words: Surgical excision, rectum, tumor, buffalo, anaesthesia, tissue, leiomyoma

INTRODUCTION

Cattle occupied the 2nd place after dogs for incidence of all tumors (Marosfoi *et al.*, 2009). Canine rectal tumors include adenoma, adenocarcinoma, carcinoma, plasmacytoma, papilloma, leiomyoma, leiomyosarcoma, lymphosarcoma, hemangiosarcoma (Davies and Read, 1990; Crawshaw *et al.*, 1998; Danova *et al.*, 2006; Rannou *et al.*, 2009). Leiomyoma, fibroma, fibrosarcoma, poorly differentiated carcinoid, adenoma and adenocarcinoma of the rectum have been reported in cattle (Bertone, 1990; Suzuki and Ohshima, 1993; Singh *et al.*, 1996; Michishita *et al.*, 2007).

Rectal polyps (Keller and Horney, 1985), adenocarcinoma (Turner and Fessler, 1980) and leiomyosarcoma (Clem *et al.*, 1987) are rare in horses and can be treated successfully by transection of attachments to the rectal mucosa. Surgery as well as suturing of the rectum are a challenge and relatively tedious because of its peculiar and inaccessible location (Anson *et al.*, 1988; Singh *et al.*, 1996). Depending on mass location within the rectum, various surgical approaches have been reported. Masses located in the caudal rectum have been removed by pedicle ligation with sharp dissection, tonsil snare, electrosurgery, cryosurgery, a dorsal rectal approach and rectal pull-through techniques (Palminteri, 1966; Holt and Lucke, 1985; Church *et al.*, 1987; Morello *et al.*, 2008). The main objective of this study is to determine the outcome of surgical excision of primary caudal rectal tumors using an anal approach facilitated by partial rectal prolapse in buffaloes.

MATERIALS AND METHODS

Total 7 female buffaloes were examined during a period from February, 2007 through March, 2011. Those animals were examined at private farm stations in Dakahlia province, Egypt. Case history, general health condition, age, clinical examination including location and size as well as description of all lesions were registered. Surgical excision, histopathological findings, survival and evidence of recurrence were also recorded. Caudal epidural anesthesia was induced with 0.03 mg kg⁻¹ B.wt Xylazine hydrochloride (XYLA JECT, ADWIA, A.R.E.) diluted in 5 mL of 2% lidocaine Hcl (Debocaine, El-Nasr Pharma. Chemicals Co. for Al-Debeiky Pharma-A.R.E.). Traumatic forceps (Lane Tissue Forceps) were used to grasp the rectal mass through the anus and tension was held on the forceps by an assistant to maintain the rectum outside. Teflon catheters with the stylet in place are inserted at right angles to each other through the external anal sphincter and healthy mucosa to maintain the prolapse during excision and suture. The mass was resected to the level of the muscularis including at least 1 cm margin of the grossly apparent normal adjacent rectal tissue. The rectal mucosa was sutured with continuous horizontal mattress suture using polydioxanone (UNICRYL M, Unimed, Kingdom of Saudi Arabia). The wound was smeared with Fucidin cream (Sodium fusidate, MINA Pharma, Egypt) and the rectum was reduced into the pelvic canal. In case of pedunculated masses, the pedicle was crushed at its attachment with the rectal mucosa. It was ligated with 1 polydioxanone suture on

the crushed area and then transected. Specimens were fixed in 10% neutral buffered formalin. Paraffin sections of 5 μ M thickness were prepared and stained with H&E and Masson's Trichrome stain for fibrous connective tissue and examined microscopically (Bancroft and Stevens, 1990). Broad spectrum antibiotics were injected for 5 successive days as well as flunixin meglumine (Flamicure, Pharma Swede, 10th of Ramadan, Egypt, 2 mg kg⁻¹ B.wt.) for 3 successive days. Soft diet was administered for 2 weeks post operation. Follow up of the operated buffaloes was done for 8 months. Rectal examination was performed 4 times to the operated buffaloes every 2 months.

RESULTS

History as well as clinical signs of all buffaloes included tissue protrusion from the anus and tenesmus. Few drops of blood were noticed during straining in one buffalo. Four animals suffered from diarrhoea. The masses did not interfere with fecal output. Clinical examination revealed good body condition with normal temperature, pulse and respiration in all cases. On rectal palpation, the masses seemed to be non painful as the animals did not resent their manipulation. Five tumors were sessile and two were pedunculated. Surgical excision was curative in the operated cases. Tenesmus was noticed in three animals from the 2nd day following surgery and it was resolved within 5 days after surgery. Clinical examination during the immediate postoperative period revealed normal parameters of the operated buffaloes. On rectal examinations, there is no evidence of tumor regrowth until 8 months post operation. According to histopathological investigations, the diagnosed rectal tumors in female buffaloes were fibrosarcoma (n = 1), fibroma (n = 2), leiomyoma (n = 2), hemangioma (n = 1) and myxoma (n = 1). Distances of the masses rostral to the anus were 4 cm (fibrosarcoma), 6, 8 cm (fibroma), 10,13 cm (leiomyoma), 7 cm (hemangioma) and 6 cm (myxoma).

Fibrosarcoma appeared as a nodular, irregular, lobulated mass protruded through the anus outside the rectum of a 6 years old buffalo (Fig. 1). The superficial surface was ulcerated. The ulcers were easily removed with fingers. This revealed red colored, fleshy mass. The mass appeared as irregular growth with dimensions (13×8.5×3 cm). Microscopically, the tumor consisted of whorls of interlacing bundles of immature fibroblasts. The neoplastic cells were pleomorphic. The nuclei were enlarged, vesicular, rounded, hyperchromatic and showed typical and atypical mitotic figures. Moreover, Fibroblasts and collagen fibers were stained bluish green with Masson's Trichrom stain.

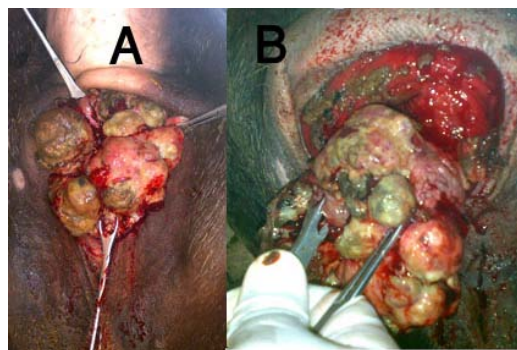


Fig. 1: Nodular, irregular and lobulated rectal tumor in 6 years old buffalo after grasping by traumatic forceps through the anus

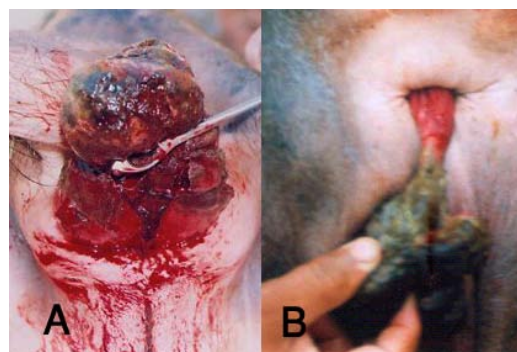


Fig. 2: A) Fleshy sessile, grayish mass projecting from the rectal lumen of 7 years old buffalo and B) Pedunculated, firm, lobulated and not encapsulated rectal mass in 5 years old buffalo

Two cases of fibromas were diagnosed in 5 and 7 years old buffaloes. They appeared as fleshy sessile masses projecting from the rectal lumen (Fig. 2A). The color was grayish in one case and reddish in the other buffalo. Consistency was soft or spongy and cut surface was pinkish in color in both cases. The tumor size varied from 5×3×3 cm to 8×5×3 cm. Microscopically, the tumor consisted of whorls of interlacing bundles of proliferated fibroblasts and collagen fibers running in various directions. The fibroblasts were spindle with tapered ends. Rectal leiomyomas were pedunculated. Each has a neck, 6 and 8 cm in length. Tumors were firm, lobulated, gray and faint reddish in color and not encapsulated (Fig. 2B). The affected animals were 5 and 7 years old. The lobulated masses were nearly spherical with 5 and 9 cm diameter. Microscopic examination revealed presence of spindle shaped bundles of neoplastic smooth muscle cells arranged in all directions with cigar shaped nuclei. A case of capillary hemangioma (plexiform hemangioma) was



Fig. 3: A) Dark red mass was identified after partial rectal prolapse in 8 years old buffalo and B) Large, dark pink mass protruded from the rectum of 4 years old buffalo

diagnosed in an 8 years old buffalo. The tumor was dark red in color and soft in consistency (Fig. 3A). It had dimensions of $9 \times 4 \times 3.5$ cm. Blood oozed upon trauma. Microscopically, the tumor consisted of thin walled capillaries of different shape and size lined with endothelial cells and filled with erythrocytes. Capillaries separated with collagen fibers besides, some inflammatory cells were noticed.

A case of myxoma was diagnosed in 4 years old buffalo. It appeared as a large, dark pink mass protruding from the rectum (Fig. 3B). It was soft in consistency and had dimensions of $7 \times 5 \times 2.5$ cm. The cut surface was slimy and glistening. Microscopically, the tumor consisted of round, oval, spindle and stellate shaped fibroblast cells with branching processes embedded in intercellular basophilic material (mucin).

DISCUSSION

Surgical excision of caudal rectal tumors via an anal approach facilitated by partial rectal prolapse in buffaloes should be considered as a viable option. Continuous horizontal mattress suture was applied after tumor excision to control bleeding and to appose mucosal edges. Partial rectal prolapse and its fixation provided excellent exposure of the caudal rectal masses as well as complete en bloc resection which prevent recurrence. Excellent outcome was obtained following surgical excision without regrowth of rectal masses >8 months post operation. This is may be due to the effectiveness of such treatment and responsive nature of these tumors to the treatment as well as their location near to the anus. Surgical excision was indicated as the sole treatment for tumors in large animals when the tumor was locally excisable without significant morbidity and or systemic

metastasis (Behery, 2002). Incomplete excision, local recurrence (Davies and Read, 1990), tenesmus, rectal bleeding and resection site granulation (Danova *et al.*, 2006) were the recorded complications in dogs following surgical excision of rectal tumors via an anal approach. Despite the recent advances in radiation and chemotherapy, surgical resection remains an integral part of curative therapy for rectal cancer in humans (Rajput and Dunn, 2007). It is economic, fast and mostly curative when the animal's health condition is good enough for surgical intervention.

Histopathological findings identified tumors like fibrosarcoma, fibroma, leiomyoma, capillary hemangioma and myxoma in the caudal rectum of buffaloes. Leiomyomas are benign tumors of smooth muscle cells arising predominantly from the musculature of tubular and hollow organs such as the gastrointestinal, urinary and genital tracts (Mobini and Kufuor-Mensah, 1987). Although, these tumors are rare in the gastrointestinal tract of cattle, the occurrence of leiomyomas in the rectum of buffaloes has been previously reported in two independent studies (Singh *et al.*, 1988; Karrouf, 2006). This study is the first description of four additional tumors affecting the caudal rectum of buffaloes. Chronic irritation and injury may contribute to the incidence of tumors in the rectal region (Singh *et al.*, 1996). All masses did not interfere with normal defecation. They may grow to a size that would not have caused some degree of obstruction. Also, their location near to the anus play a role where the masses protruded outside during straining and defecation.

The low reported incidence of rectal neoplasia in buffaloes as compared with canines and humans may be attributed to the low distribution along the world as well as the low mean age of commercially slaughtered buffaloes. Geographic location is also an important factor in the incidence of bovine gastrointestinal neoplasia (Bertone, 1990).

Surgery of the rectum can be challenging because of the regional anatomy; however an anal approach with rectal prolapse has been described for resection of rectal masses located caudal to the pelvic inlet (Anson *et al.*, 1988). Anal approach of cranial rectal lesions may be more challenging and colorectal, pararectal, intra-pelvic and intra-abdominal structures cannot be accessed or inspected with this method (Davies and Read, 1990). The prognostic factors of colorectal polyps in humans include, sessile or pedunculated morphology of the polyp whether partial or en bloc resection is carried out, the degree of differentiation of the carcinoma, vascular or lymphatic involvement and whether the polypectomy resection margin is tumor free (Bujanda *et al.*, 2010). Myxoma is a

tumor of specialized fibrous tissue that is capable of producing mucin and is commonly reported in cattle (Rao, 2004). The histopathological findings of rectal myxoma are in agreement with a previous study (Rapini *et al.*, 2007).

CONCLUSION

It was found that all affected animals were females. This may be explained partially by the fact that males had been sent to be slaughtered before the age of peak incidence. It was found that all affected animals were females. This may be explained partially by the fact that males had been sent to be slaughtered before the age of peak incidence.

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