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Successful management of umbilical hernia by hernioplasty in fat tailed buck (Dumba): A rare case report

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Abstract
A nine months old fat tailed buck (Dumba) was presented to Referral Veterinary Polyclinics, ICAR-Indian Veterinary Research Institute, Izatnagar-243122 (U.P) with history of swelling at umbilical region since last few months. Clinical examination revealed umbilical hernia with hernial ring of 5 fingers breadth. The defect was corrected by hernioplasty using polypropylene mesh. The animal recovered well within 10 days postoperatively.

Keywords: fat tailed buck (Dumba), umbilical hernia, hernioplasty, polypropylene mesh

Introduction
Hernias are protrusion of an organ or tissue through an opening which may be either natural or acquired (Das *et al*., 2012) [3]. Umbilical hernia occurs at the umbilical ring and most common in young ages due to congenital nature of the defect and it is frequently small (Frank, 1964) but becomes larger due to increased body weight, increased intra-abdominal pressure when the age advances (Abdin-Bey and Ramadan, 2001) [1] and hampers the reproduction and production of the animals (Purohit, *et al*., 1983) [9].

Among different hernias, umbilical hernias are fairly common surgical affection reported among calves, foals, and pigs, but are not frequently common in small ruminants (Al-Sobayil and Ahmed, 2007) [2]. It may be congenital or acquired, and many small umbilical hernias resolve spontaneously, but large or strangulated umbilical hernias will necessitate surgical corrections which may vary from simple herniorrhaphy to hernioplasty depending on the size of the defects. Previously small abdominal wall defects were reconstructed by simply apposing muscles. Now in this recent era synthetic meshes and prosthetics in case of large hernial defects showing promising outcomes. The surgical management of hernias in human literature emphasizes the use of prosthetic materials in hernias larger than 3 cm to avoid recurrence (Venclauskas *et al.*, 2008) [14]. Among synthetic materials polypropylene mesh is frequently used as suitable material for abdominal wall defect repair, because of its inert nature can be used even in presence of contamination (Vilar *et al.*, 2009) [15].

The present study describes a rare case of successful management of umbilical hernia in a fat tailed buck (Dumba) by hernioplasty using polypropylene synthetic mesh without much complications and reoccurrence.

Material and Methods
A nine months old fat tailed buck (Dumba) weighing around 20 Kg was presented to Referral Veterinary Polyclinics, ICAR-Indian Veterinary Research Institute, Izatnagar-243122, U.P with history of swelling at umbilical region from birth but increasing in size since last few months. Clinical examination revealed reducible swelling that extended from the umbilicus to preputial region (Fig 1). The size of the hernial ring was 5 fingers in breadth (Fig 2). The clinical parameters *viz.* rectal temperature, heart rate and respiratory rate were within normal range however, animal was dull, depressed with reduced appetite. On the basis of clinical examination, the case was diagnosed as umbilical hernia and was decided to correct by hernioplasty using polypropylene mesh.

Fig 1: Umbilical Hernia (Pre-operative view)

Fig 2: Palpation and measuring size of hernial ring

Food was withheld for 24 hours and water for 12 hours prior to surgery. Preoperatively the surgical site was prepared aseptically (Fig. 3) and buck was sedated with an intramuscular administration of (2%) Xylazine hydrochloride (Xylaxin®, Indian Immunologicals Ltd., India) at a dose of 0.2 mg/kg. Body weight and as well as ring block anaesthesia was achieved by local anaesthetic 2% lignocaine hydrochloride (LOX 2%®, Neon Laboratories, India) with the dose rate 1 ml/cm area.

Fig 3: Hernia after surgical site preparation

Fig 4: Henial contents (Intestine and omentum)

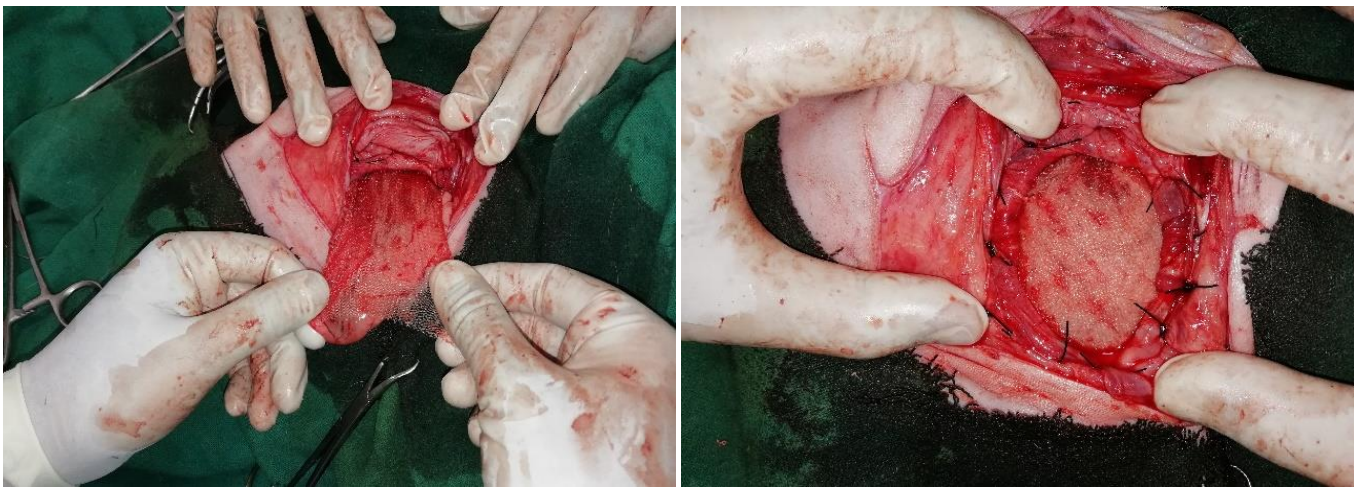

Fig.5 & Fig. 6: Intraoperative image of polypropylene mesh sutured between the parietal peritoneum and abdominal wall along the hernial ring

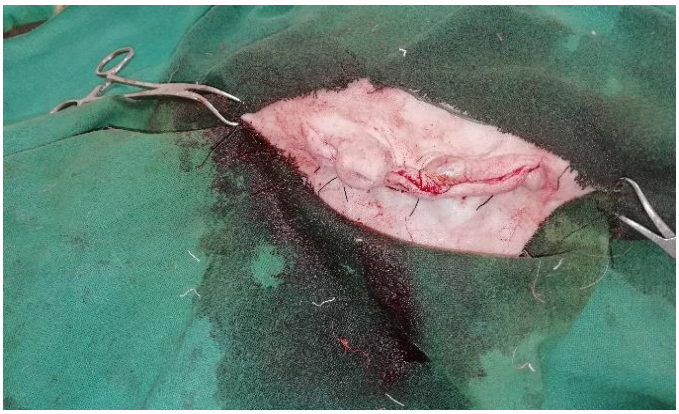

Fig 7: Site of hernia after skin closure

The animal was positioned in dorsal recumbency and the skin incision was made directly over the hernia (on one side of the preputial orifice). After careful dissection of skin and subcutaneous tissue, the condition of the hernial sac and hernial ring was examined to confirm any adhesions in the abdominal organs (Fig 4). The herniated viscera were repositioned back in the abdominal cavity manually. Then, a 1-mm dissection was performed eccentrically around the ring to make the ends freshened. The hernioplasty was performed through the use of a polypropylene mesh (Optilene® Mesh LP; Barcelona, Spain) and the margins were interposed between the parietal peritoneum and the muscle-fascial layer (transverse fascia). The mesh was sutured to the abdominal muscle layer and the fascia, 5mm along the hernial circumference by inlay method (Fig. 5). The suture was performed using a single U or interrupted horizontal mattress suture pattern with all knots on outer side by using No. 2 monofilament polyamide (Relyon®, India) (Fig. 6). Once all of the single sutures were positioned, they were tied. Subcutaneous tissue and skin were sutured in standard manner (Fig. 7). The excess of distended skin was left because it would shrink to its original anatomic dimensions and position postoperatively. During postoperative period, an antibiotic and anti-inflammatory treatment was administered for 05 consecutive days. Skin sutures were removed on 10th day postoperatively.

Results and Discussion

In the present study, slight swelling was observed at the site of operation for 3 days and subsides gradually on 7th post-operative day. The complete healing was recorded on 10th day postoperatively without reoccurrence and much complications except mild post-operative oedema might be due to dead space left.

The umbilical opening in small ruminants should close after birth in few days. Failure of this opening to close properly results in umbilical hernia and its cause might be either congenital or acquired factors that hampers this closure, such as omphalitis or abscesses (Al-Sobayil and Ahmed, 2007) [2]. Another reason could be the relatively thin nature of abdominal wall of goat in comparison to other ruminants. Any trauma or extreme abdominal distention in goats occasionally leads to rupture of the ventral abdominal muscles just caudal to the umbilicus (Smith and Sherman, 1994) [13]. Umbilical hernias are quite commonly observed in young calves (Horney and Wallace, 1984; Kumar *et al.,* 2012) [6, 8] but rare in goats (Smith and Sherman, 1994; Gangwar *et al.,* 2012) [13, 5, 8]. Inspite of its commonness, it is generally ignored by the rural farmers unless it results in some serious forms and affecting productivity and reproductivity of the animals (Purohit *et al.,* 1983) [9].

There are lots of treatment options for umbilical hernia that depend on the size of the hernial ring. Application of bandage, clamps or ligatures may be helpful in some cases where the hernial ring is small. Surgical intervention (herniorrhaphy) is required in case of large hernial opening (more than 1 finger in size or if it persists for more than 3 to 4 weeks) but extensive umbilical hernia warrants hernioplasty (Abdin- Bey and Ramadan, 2001; Pugh, 2002; Kumar *et al.,* 2014) [1, 10, 7]. Literature on human surgery emphasizes the use of prosthetic materials for hernioplasty when the hernial opening exceeds 3 cm in diameter (Venclauskas *et al.,* 2008) [14]. Generally, the non-absorbable sutures should be used if the hernia was at least 8 months old or else having large hernial opening (>4 fingers). Absorbable sutures can be used in cases where the size of hernial ring is no more than 4 fingers or if the hernia is less than 8 months old (Al-Sobayil and Ahmed, 2007) [2]. In our opinion, the same value could also be considered valid in young goats, so we decided to repair it through hernioplasty by using polypropylene mesh sutured with non-absorbable suture material in the present study. Avoiding recurrence is important for goats because the ruralness of this species and owner's ignorance rarely permits a correct and long-term postoperative follow-up (Remya *et al.,* 2015) [12]. The biocompatibility of polypropylene mesh, its ability to provide good resistance to tensile forces applied by the muscular structures, and the pressure by abdominal viscera is well described in the literature. It also represents an excellent tool to support granulation tissue, and later, tendon-like tissue. In addition, the mesh has a good adhesive capacity with surrounding tissues (Vilar *et al.,* 2009; Rathore, 2018) [15, 11]. Rathore (2018) [11] used polypropylene mesh in 6 clinical cases (4 bovines, 2 canines) of umbilical hernias with good results and no recurrence as reported using this material. The margin of safety provided by this material for treating umbilical hernias can compensate for the higher costs compared with traditional surgery, because it can reduce the incidence of recurrence, as reported in other animal species *viz.* horses and dogs (Vilar *et al.,* 2009; Wilhelm *et al.,* 2007) [15, 16]. The results showed the effectiveness of hernioplasty using polypropylene mess with minimum complications and animal met uneventfull recovery.

Conclusion

The umbilical hernia is a rare disease in goats, especially when the size of the hernial port exceeds 3 finger breadth. Hernioplasty could be elite technique for repair of umbilical hernia in goats having positive good outcomes when reoccurrence is also kept in mind.

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