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## Hernioplasty for umbilical hernia in six crossbred heifers

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### Abstract

The present study was conducted in 6 heifers weighting between 210 to 320 kgs presented to the large animal surgical unit of Rajiv Gandhi institute of veterinary education and research with the history of swelling in the umbilical region which kept increasing in size. All the 6 cases were between the age group of 1.5 to 3 years. On palpation of the swelling revealed the presence of soft reducible mass through a 4 to 5 finger dilatated hernial ring. These cases were confirmed as umbilical hernia due to either congenital or acquired reasons. Under sedation with xylazine at the dose rate of 0.1 mg/kg, hernioplasty using polypropylene mesh was performed in all the cases. The recovery was complete in all the heifers with minimal complications. It is concluded that hernioplasty using polypropylene mesh has been effective in managing large umbilical hernias in adult bovine without any complications.

**Keywords:** Heifers, congenital umbilical hernia, hernioplasty, polypropylene mesh

### Introduction

A hernia is defined as protrusion or displacement of a tissue or an organ or part of an organ outside the body cavity through a normal or abnormal opening in the body wall which can be noted from outside and can be detected with an external examination (Fesseha *et al.*, 2020) [4]. The cause of the umbilical hernia could be congenital or acquired in nature (Vinit Doijode *et al.*, 2019) [17]. Congenital hernias can occur due to improper closure of umbilical opening at birth or from maldevelopment or hypoplasia of abdominal muscles. This defect may remain in the mid ventral abdominal region to form the congenital hernial ring (Al-Sobayil and Ahmed *et al.*, 2007) [2]. The acquired umbilical hernia occurs due to mal-handling of the calf at birth, resection or cutting of the umbilical cord too close to the abdominal wall, excessive straining of the calf due to diarrhea and constipation and infection of umbilical cord (navel ill) preventing the natural closure of umbilical orifice (Steenholdt and Hernandez, 2004 and Tyagi and Jit Singh, 2010) [12, 15]. Large hernias in adult cows require safe closure because they may interfere with the athletic activity or normal parturition leading to complications (Elce *et al.* 2005) [3]. Repairing of large abdominal hernias using polypropylene mesh in horses and cows (Tulleners and Fretz 1983) [14], with polyester mesh (Sagar *et al.* 2010) [9] and nylon mesh (Kumar *et al.* 2002) in cows were tried successfully.

### Case history and observation

Six heifers weighting between 210 to 320 kgs presented to the large animal surgical unit of Rajiv Gandhi institute of veterinary education and research with the history of swelling in the umbilical region was taken into the study. In two of the cases (Heifers 2 and 6) swelling was noticed since birth, in two cases (Heifers 3 and 4) as result of navel ill and in two cases (Heifers 1 and 5) as a result of injury (Table 1). In all these cases the swelling kept increasing in size. History revealed that the animals feeding and voiding habits were normal. On palpation of these swellings, revealed the presence of soft reducible mass through a 4 to 5 finger dilatated hernial ring (Table 1). These cases were confirmed as umbilical hernia either due to congenital or acquired reasons.

All the other vital parameters were within the normal range.

### Treatment and Discussion

All the animals were withheld feed for 24 hours and water for 12 hours pre-operatively. Under sedation with xylazine at the dose rate of 0.1 mg/kg, the animals were restrained on lateral recumbency and the region around the umbilical area was aseptically prepared (Figure 1). An elliptical incision was made over the umbilical swelling (Figure 2). The hernial sac was identified, bluntly dissected and freed down to the hernial ring. The hernial contents were found to be omentum in heifer 2, loops of intestine in heifer 3, omentum and a few loops of intestine in heifers 1, 4 and 6 and omentum, a few loops of intestine and reticulum in heifer 5. The contents were pushed back into the abdominal cavity, the hernial sac was excised and the edges of the hernial ring were debrided (Figure 3). An onlay repair of umbilical hernia was performed using variable size of polypropylene mesh according to hernial ring size (Figure 4 and 5). The sizes of the polypropylene mesh used were 10X15 cm in heifers 1,4,5,6 and 6X11 cm in heifers 2 and 3 (Table 1). The subcutaneous tissue was closed with catgut size 1 by continuous suture pattern (Figure 6) and skin closed with silk by horizontal suture pattern. The skin sutures were protected using a dry gauze fixed by stent sutures (Figure 7).

Post-operative care includes administration of inj. Steptopenicillin at the dose rate of 1 mg/25kg body weight intramuscularly once daily for 5 days, inj. Meloxicam at the dose rate of 0.5 mg /kg intramuscularly for 3 days. Dressing of the surgical site was done with antiseptic solution (povidone iodine) in all the animals every day. The sutures were removed on 10<sup>th</sup> post-operative day and advised to restrict the feed to half the quantity for the first 2 weeks after the umbilical repair to minimize pressure on the site of the incision. An uneventful recovery was noticed in all the animals (Fig 8). Females are more frequently affected than males (Steenholdt and., Hernandez, 2004 <sup>[12]</sup>, Sutradhar *et al.*, 2009 <sup>[13]</sup>, and Tyagi and Jit Singh, 2010) <sup>[15]</sup>. Hernioplasty is the use of mesh implants for closure of large body wall defects because of the inability to oppose the edges of the defect and the excessive tension placed on the suture line, which can lead to failure of hernial repair (Van der Velden and Klein, 1994) <sup>[16]</sup>. The benefits of the hernial mesh implants include strength, non-bio sensitivity, lack of elasticity and degradation that allow a more even distribution of load (Hilbert *et al.* 1978) <sup>[6]</sup>. Polypropylene mesh is one of the most commonly used prosthetic materials for repair of large ventral hernia in large animals (Finan *et al.*, 2009) <sup>[5]</sup>. Kaseem *et al.*, (2018) <sup>[18]</sup> fixed polypropylene mesh subcutaneously in five large hernial ring in male and female calves without any complications. Similarly, Singh *et al.*, (2011) <sup>[10]</sup> used polypropylene mesh for correcting ventral abdominal defect in a cow. Most frequent complications reported by use of prosthetic mesh are formation of adhesions and stercoral fistulas (Mathews *et al.* 2003) <sup>[19]</sup>. Singh *et al.* (2012) <sup>[11]</sup> performed hernioplasty in eleven adult bovine cases using nylon mesh for massive ventral abdomen hernia with one case developing stercoral fistula. In the present cases no such complications were observed.



Fig 1: Animal cast in lateral recumbency after sedation



Fig 2: An elliptical incision over the hernial swelling

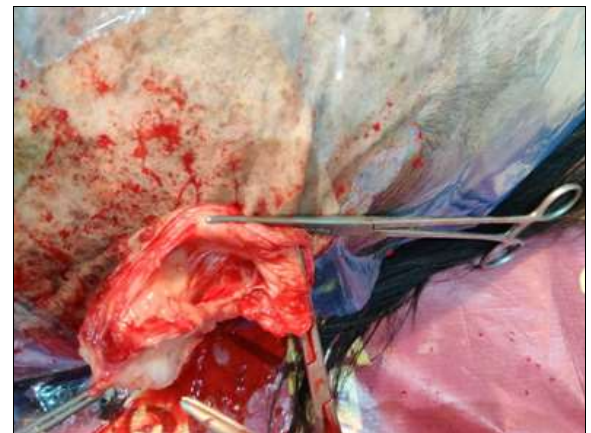
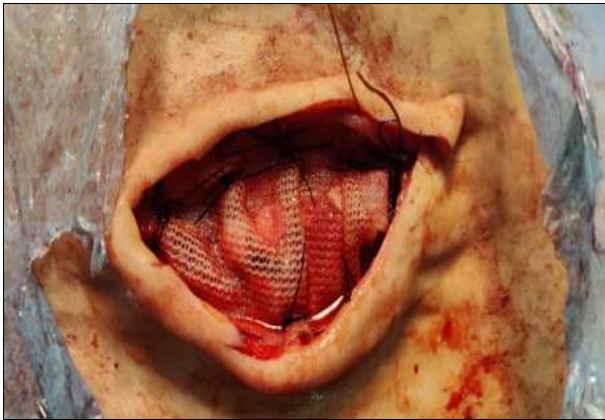


Fig 3: Hernial contents pushed inside and excision of hernial sac



Fig 4: Onlay repair of umbilical defect using polypropylene mesh in Heifer 6





**Fig 5:** Onlay repair of umbilical defect using polypropylene mesh in Heifer 2



**Fig 7:** Skin closed with silk and protected with stunt sutures with a gauze in heifer 6



**Fig 6:** Subcutaneous tissue closed with absorbable suture



**Fig 8:** Post-operative heifer 2

**Table 1:** Animal, Age (in years), Duration of illness, cause, clinical signs, hernial contents and size of polypropylene mesh used (cm)

Animal	Age (in years)	Duration of illness	Cause	Clinical signs	Hernial contents	Size of polypropylene mesh used (cm)
Heifer 1	3	2 weeks	Injury	Swelling with 5 finger dilatation	Omentum and Intestine	10X15
Heifer 2	1.5	Since birth	Congenital	Swelling with 4 finger dilatation	Omentum	6X11
Heifer 3	1.7	Since birth	Navel ill	Swelling with 4 finger dilatation	Intestine	6X11
Heifer 4	2	Since birth	Navel ill	Swelling with 5 finger dilatation	Omentum and intestine	10X15
Heifer 5	2.7	3 weeks	Injury	Swelling with 5 finger dilatation	Omentum and reticulum intestine	10X15
Heifer 6	2.5	Since birth	Congenital	Swelling with 4 finger dilatation	Omentum and intestine	10X15

**Conclusion**

Accordingly, hernioplasty using polypropylene mesh was found to effective in managing congenital or acquired umbilical hernia in heifers without any complications. Use of polypropylene mesh had excellent long-term outcome in large umbilical hernias.

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