

# **A Case Report on Surgical Management of Umbilical Hernia in a Crossbred Holstein Friesian Calf**



By:

**Imran Khan Emo**

Roll : 18/45

Registration No: 03007

Intern Id : 43

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**A Case Report on Surgical Management of Umbilical Hernia in a  
Crossbred Holstein Friesian Calf**



**A Clinical Report Submitted as per Approved Styles and contents**

**Approved by:**

.....

**Dr. Md. Masuduzzaman**

**Professor**

**Department of Pathology and Parasitology**

**Faculty of Veterinary Medicine**

**Chattogram Veterinary and Animal Sciences University**

**Khulshi-4225, Chattogram, Bangladesh**

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## Abstract

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Umbilical hernia is a condition where abdominal contents protrude through a weakened area of the body wall of the umbilical region. It is frequently observed in young calves, particularly in Holstein Friesian crossbred calves. The aim of the study is to describe the successful surgical management of a congenital umbilical hernia in a five-month-old Holstein Friesian crossbred calf. According to the owner's complaints, the umbilical hernia had been present since birth and had progressively enlarged. In clinical examination, the protruded area was soft on palpation and easily reduceable into the abdominal cavity through an opening on gently pushing. Furthermore, Radiography and ultrasonographic examinations were performed for confirmatory diagnosis leading to umbilical hernia and was decided to conduct surgical management. Prior to surgery, the animal was sedated with diazepam, and the aseptically prepared surgical area was anesthetized with lidocaine hydrochloride. Then, the umbilical hernia of the calf was corrected with the herniorrhaphy method using Mayo mattress sutures. Post-operatively, antibiotics, anti-inflammatory, and antihistaminic were administered to prevent infection and minimize pain, and an ointment of povidone-iodine was applied for wound care. Therefore, this case report provides valuable insights into the successful surgical management of umbilical hernia in young calves, emphasizing the significance of a comprehensive approach combining surgical intervention with post-operative care to ensure optimal outcomes.

**Keywords:** Umbilical hernia, surgical management, calf

## Chapter 1: Introduction

A hernia occurs when internal contents of a body cavity protrude through a weak spot in the body wall due to an unintentional or incomplete anatomical opening (Al-Sobayil and Ahmed, 2007). An umbilical hernia is when abdominal contents push through a break in the abdominal wall at the umbilicus, forming a sac made of skin and connective tissue around it (Kumar et al., 2014). All domestic animals can have it, but calves, pups, and foals are the ones who get it the most frequently (Priestar et al., 1970). Short gestation periods and multiple births are two significant risk factors for congenital umbilical hernias in calves (Herrmann et al., 2001). Animals most frequently have umbilical hernias as congenital conditions. Umbilical hernia is a birth defect that results in the protrusion of abdominal contents into the hernia sac, which is created by the skin, as a result of inappropriate closure of the umbilicus opening at birth or from malformation/deficiency in development, or hypoplasia of the abdominal muscles (Singh et al., 1989). An autosomal gene that can be acquired or present at birth predominates in umbilical hernias. The manual cutting, sectioning, or breaking of the chord close to the abdominal wall is the main cause of an acquired umbilical hernia. With or without an momentum, the abomasum is the visceral organ most frequently involved in umbilical hernias in ruminants (Singh et al., 1989).

There are both surgical (herniorrhaphy) and non-surgical treatment options available. Despite limitations, herniorrhaphy is the preferred course of action (Sutradhar et al., 2009). Hernias can be small at birth and get bigger over time. Typically, omentum, fat, and, in certain larger hernias, small intestinal segment fragments make up the umbilical hernia contents. Although open herniorrhaphy is the procedure most frequently used in veterinary medicine, umbilical hernias can also be corrected by ligating the hernial sac, using clamps, suturing the hernia sac, or even performing a radical operation (O'Connor, 1980). This report aims to describe the effective surgical treatment of a calf suffering with uncomplicated umbilical hernia.

## Chapter 2: Case Presentation

### 2.1. Case history and observation:

A five-months-old Holstein Friesian crossbred male calf weighing 62 kg was presented to the SAQTVH, Chattogram Veterinary and Animal Sciences University with a history of swelling at the umbilical region from birth but increasing in size since last few months. On clinical examination revealed a soft swollen elongated mass at the umbilical region (Figure 1A). the swollen area was reducible when it was gently pushed into the abdominal cavity through a ring like opening and the hernia ring was three fingers wide. The physical parameters including rectal temperature, heart rate, and respiration rate, color of mucous membrane, hydration status were within normal ranges. Based on a clinical examination, the case was tentatively diagnosed to be an umbilical hernia.



Figure 1: A calf was suffering from an umbilical hernia presenting in SQTVH

### 2.2. Radiographic and Ultrasonographic Examination:

The radiographic examination was performed using a digital radiography and revealed radiolucent contents within the swollen area coming through an opening under the skin, (Fig. 2). **Ultrasonographic Examination** was conducted with a portable ultrasound machine using 10 MHz linear transducer. Ultrasonography was performed with both

vertical and sagittal plane and revealed that hypoechoic loops of intestine were clearly visible within the swollen area.

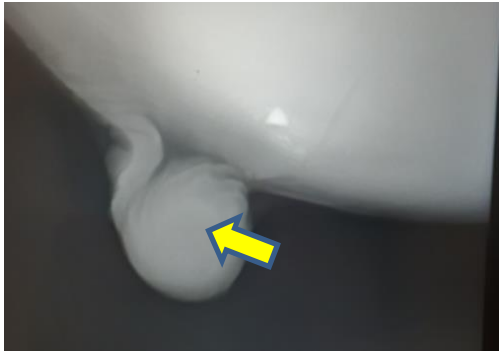


Figure 2: Radiolucent separated contents on radiography

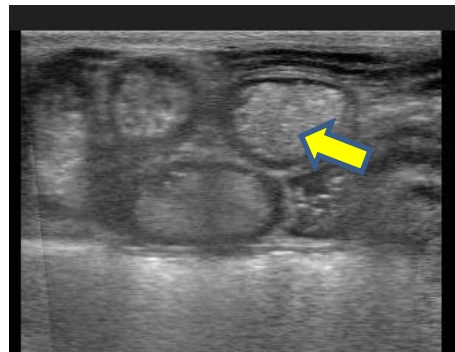


Figure 3: Hypoechoic cross sections of intestinal loops within cavity

### **2.3. Patient preparation and anesthesia**

The surgical region was clipped for removing of hairs and the surgical site was aseptically prepared using 10% povidone iodine (Povisep, Jayson Pharmaceuticals Ltd., Bangladesh) and 70% alcohol. The animal was administered an intravenous dose of diazepam (Sedil@, Square Pharmaceuticals, Bangladesh) at a dosage rate of 0.5 mg/kg body weight as a sedative. Then, the animal was positioned at lateral recumbency on operation table. Later, a circular local infiltration of 2% lidocaine hydrochloride (Jasocaine@, Jayson Pharmaceuticals Ltd., Bangladesh) at a dose of 6 mg/kg body weight was carried out in the umbilical region to anesthetize the surgical area. The calf was given 0.9% normal saline solution (NS@, ACME Laboratories Ltd., Bangladesh) intravenously at the rate of 10ml/kg body weight during the surgical period.





Figure 4: Diazepam is administered in jugular vein of calf



Figure 5: Surgical area is swabbed with povidone iodine

### **Surgical procedure:**

A longitudinal skin incision was placed on the swollen area and fascia were incised using blunt dissection to exposed the hernial sac. The entire hernial sac was separated from subcutaneous using blunt incisions. Then, a longitudinal incision was made on the hernial sac to expose the hernial contents. The hernial contents which were loops of small intestines were digitally manipulated and reinserted into the abdominal cavity. Furthermore, the hernial ring was exposed and gently scarified with surgical blade to accelerate the healing and closed with mayo mattress sutures using non-absorbable suture material prolene no. 1. After removal of extra tissues of hernial sac, fascial were opposed with simple continuous sutures using absorbable suture material chromic catgut no. 1-0. Then, subcutaneous sutures were placed using chromic catgut no. 1-0 under the skin and the extra skin was excised for better apposition. After that, the skin incision was closed with cross mattress sutures using silk no. 2. Ointment of povidone iodine was applied on incised wound and temporary bandage was applied to cover the surgical wound area.

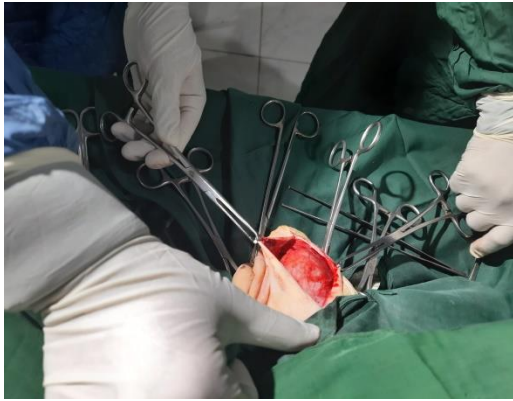


Figure 5: A longitudinal skin incision was made on swollen area

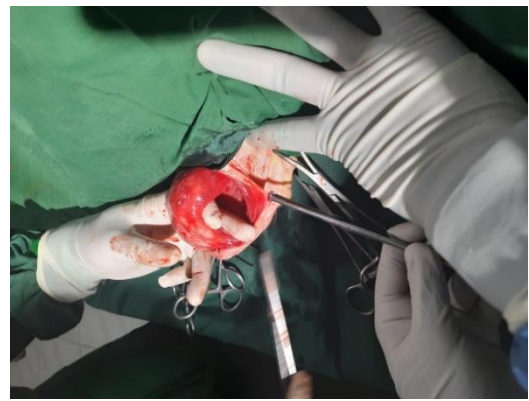


Figure 6: hernial sac was separated from subcutaneous tissues by digital pressure and blunt dissections



Figure 7: The separated hernial sac



Figure 8: Intestinal loops were visible within the hernial sac

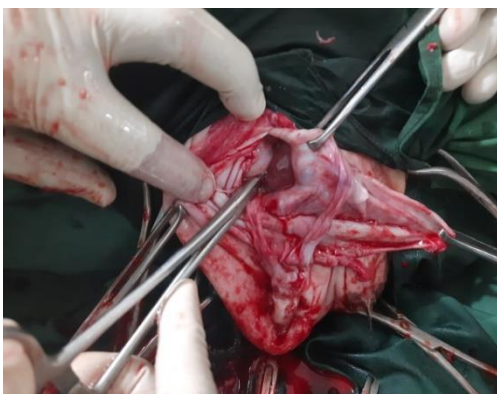


Figure 9: Intestinal loops were entered into abdominal cavity through hernial ring



Figure 10: Mayo mattress sutures were placed to the hernial ring



Figure 11: Simple continuous suture was placed to appose fascia



Figure 12: Cross mattress sutures were placed to close the skin incision after placing of subcutaneous sutures.

### Post-operative care

For post-operative care, a combination of beta-lactam antibiotic at a dosage rate of 40000 IU/Kg body weight (Benzylpenicillin + Procaine Penicillin) and aminoglycosides at a dosage rate of 10 mg/Kg body weight (Streptomycin) were administered intramuscularly (IM) for 7 days, along with a non-steroidal anti-inflammatory drug (meloxicam) at a dosage rate of 0.5 mg/kg and antihistaminic (Hista Vet) at a dosage rate of 1 mg/kg were administered intramuscularly for 3 days and 7 days respectively. Then, 5% Povidone Iodine ointment was applied twice daily for 14 days to prevent external bacterial infection of surgical wound. The surgical site was correctly assessed after two weeks and the skin suture was removed gently.



Figure 13: Ointment of povidone iodine was applied on surgical wound



Figure 14: The surgical wound was completely healed after 14 days

### **Chapter 3: Result**

The anesthetic recovery was smooth and the animal was stand up within 30 minutes after surgery. No intraoperative and postoperative complication were found in this study. The surgical site was correctly assessed after two weeks, normal healing without any recurrence or other complications was seen.

## Chapter 4: Discussion

Umbilical hernias are often seen in young calves. The size of the hernia is influenced by the degree of the umbilical defect and the amount of abdominal content it contains. This type of illness has a lot of negative effects, such as a reduction in the production and reproductivity of the afflicted animals. The causes of this affliction have been discussed in several texts, and they often fall into one of two categories: acquired or congenital (Virtala et al., 1996; Fesseha, 2020). An umbilical hernia is also noted in the current case report in a six-month-old calf. Additionally, congenital abnormalities are widespread in cattle and have an incidence of 0.2-1.3%, with 40–50% of newborns dying from them. Umbilical hernias are a congenital abnormality that lowers the value of the afflicted calves and should be treated surgically. Dairy cattle, particularly Holstein Friesian types, are exceptionally susceptible to the illness. It may be passed on by total penetration from a dominant character or influenced by external variables (Weaver AD et al., 2018). The current case report describes a young Holstein Friesian cross calf with a congenital umbilical hernia that is three fingers wide. This is consistent with earlier studies that congenital umbilical hernias in Holstein calf are frequent and predominantly heritable. Hernias consist of the hernia sac, peritoneum, and may also include viscera and peritoneal fluid (Anderson DE et al., 2004). The abomasum with or without omentum was the most typical viscera implicated in umbilical hernias in cattle. Hernias may start out tiny at birth before growing larger with age; they should be distinguished from umbilical sepsis (Anderson DE et al., 2004). Depending on the size of the hernial ring, there are many therapeutic options for managing umbilical hernias. Smaller hernia rings can be readily controlled by using bandages, clamps, or ligatures. The sole treatment that is frequently performed in cases of local obstruction in calves is herniorrhaphy. In addition, hernioplasty is necessary if the umbilical hernia is significant and the size of the hernial aperture is greater than one finger or lasts for more than three to four weeks. (Abdin-Bey et al., 2001). Congenital umbilical hernias may develop complications, which can significantly increase the difficulty and cost of the treatment. While complex hernias (incarcerated viscera often without strangulation, or concomitant infection of umbilical tissues) cannot be entirely reduced, basic (or uncomplicated) hernias may be easily reducible (Adam SB et al., 2000). Simple congenital umbilical hernias that remained until the calf was 5 to 6 months old, grew over time, or did not respond to conservative treatment (Adam SB et al., 2000). Similar to that, a small amount of adhesion between the hernial sac and content was visible during the surgery in this case report.

## **Chapter 5: Conclusion**

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In conclusion, Surgical management, including herniorrhaphy using mayo mattress sutures and the use of synthetic non-absorbable suture material like polyene, is recommended as an effective technique for the successful management of umbilical hernia. In addition to the surgical procedure, the administration of antibiotics, antihistamines, and anti-inflammatory medication is crucial in the post-operative phase to prevent infection, manage pain, and reduce inflammation.

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## **Biography of Author**

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This is Imran Khan Emo, the first child of Md. Abdul Mazid Khan and Sabakun Nahar, doing his graduation with a Doctor of Veterinary Medicine (DVM) at Chattogram Veterinary and Animal Sciences University under the Faculty of Veterinary Medicine. He passed the Secondary School Certificate Examination (SSC) in 2014 from Eidgah Model High School, Cox's Bazar and got a GPA of 5.00, and then the Higher Secondary Certificate Examination (HSC) in 2016 from Govt. Haji Mohammad Mohsin College, Chattogram and got a GPA of 5.00 out of 5.00. Currently, he is doing his yearlong internship. He has great enthusiasm in his study area to develop day-one skills and gain more practical knowledge to be prepared for the modern era of science.