Surgical Correction of Umbilical Hernia in a Female Calf at SAQ Teaching Veterinary Hospital, CVASU

A Clinical Report Submitted

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Abstract

Umbilical hernias are the most common birth defect in calves. The research confirmed that the umbilical hernia usually occurred in calves due to failure to close the umbilical cord. This paper aims to report the surgical correction of an umbilical hernia in a female bovine calf. A four-month-old female calf weighing approximately 110 kg was brought to SAQ Teaching Veterinary Hospital, CVASU,Chattogram , with a history of swelling at the umbilical region from birth for the last few months. The case was diagnosed as a hernia by case history, inspection and palpation, all the other physiological parameters (e.g., temperature, heart rate, respiration rate) were within the normal range. Herniorrhaphy was used to correct the condition and treated with antibiotics and antihistaminic and anti-inflammatory drugs during post-operative period. The calf recovered without any reoccurrence after three weeks of surgery. This case report discusses the successful correction of an umbilical hernia.

Keywords: Herniorrhaphy, Umbilical hernia, Calf

Chapter I: Introduction

Hernia is an abnormal protrusion of contents from a closed cavity through a potential or abnormal opening. The hernia can be reducible which means hernial mass can be returned to their normal location through hernial ring while irreducible type of hernia can not pushed back. According to their anatomical placement, the many hernia types in small and large animals are divided into umbilical, inguinal, scrotal, femoral, perineal, and ventral (or abdominal) hernias (Fossum, 2012; Farman *et al*., 2018). There are three anatomical components of a hernia. These are hernia ring,hernia sac and hernial content. The abdominal wall is mainly made up of muscles and ligaments, this serves as a shield and have the natural function of carrying the abdominal contents, primarily the intestines, where most frequently hernia occur in cattle.An umbilical hernia refers to an external abdominal hernia in which the contents of the abdominal cavity protrude from the weakened umbilical area. Umbilical hernia can be divided into three categories including uncomplicated umbilical hernia,umbilical hernia with subcutaneous infections(Abscess)and umbilical hernia with umbilical remnant infection.An umbilical hernia is caused as a result of the failure of the abdominal musculature to close properly around the umbilical structure. Besides, external trauma to the umbilicus, secondary umbilical sepsis, hereditary factors, inflammation and sepsis of the umbilicus, postcalving infection of umbilical infection, breakage of the umbilicus during manual traction of the fetus, hypoplasia of the abdominal musculature, and multiple births (twins, triplets, etc.) are considered to be the cause and predisposing factors (Kumar, 2001; Fesseha, 2020). Hernia is susceptible to most of the breeds of cattle but it is more frequent in Holstein-Friesian and at the age of 5-7 weeks most cases are found. Horney et al., 1984 and Pugh (2002) reported that the umbilical hernia occurred at an average age of 6- 7 weeks after birth. Besides, it is more common in female cattle than male cattle (Fesseha, 2020). An Umbilical hernia can be symptomicor asymptomatic upon their clinical presentation and usually seen shortly after birth.Besides,it is usually painless if it is non-strangulated and non- infected hernia. Generally, the contents of most cases of umbilical hernias are the omentum, small intestine, or abomasum (Misk *et al.*, 2008; Kumar *et al.*, 2013). Size of the hernia depends mostly upon the extent of umbilical defect and quantity of the contents in the harnial sac of calves (Rings et al. 1995, Steenholdtz et al. 2004). From the case history and by palpation of the hernial area, the main diagnosis can be obtained (Jaman *et al*., 2018) and

ultrasonagraphy is also an important diagnostic method of hernia. In certain situations, an exploratory puncture of the bulge and the finding of intestinal contents serve to confirm the diagnosis (Jaman*et al*., 2018). A hernia can be treated using a variety of medicinal and surgical procedures. The prognosis of hernia mainly depends on the type and state of hernia. If, an early diagnosis and course of therapy can be applied then the umbilical hernia heals more successfully. That's why, Simple umbilical hernias can be treated in a number of different ways or not at all. Surgicallyhernia can be treated in a number of ways depending on the size of the hernial ring at the site (Rings, 1995). The most common surgery is the primary repair which is also known as Herniorrhaphy. It is a surgical procedure that includes placing sutures in a straight line at the abdomen area to treat simple hernias. Correction of umbilical hernia using the method of herniorrhaphy is a good choice. The second type of surgery is the Mesh repair which is well known as Hernioplasty. It is a surgical procedure that uses networks or wires to treat large and complex hernias and mainly it involves using a laparoscope. Besides these two surgical methods a combination of primary and mesh is used in complex abdominal wall and hernia treatments (Sutradhar *et al*., 2009). Due to lack of sufficient treatment facilities most of the rural farmers overlook it and sometimes quack gives wrong treatment. The present study describes the successful management of an umbilical hernia by herniorrhaphy in a calf in a field setting.

Chapter II: Materials and Methods

2.1. Case history and observation

A Holstein Friesian Crossbred calf that was four months old and weighed around 110 kg was brought to SAQ Veterinary Hospital, CVASUChattogram, with a history of large swelling in the umbilical area that had been there from birth but had recently become larger (Figure 1). The calf was normal in feeding with other clinical parameters. On palpation, the swelling was painless and reducible with a large hernia ring.The hernial ring was measured about six inch in width. Other clinical parameters including heart rate, respiration rate, and rectal temperature were all within acceptable limits and the overall health condition of the patient was good. Based on clinical examination, the case was diagnosed as umbilical hernia and was corrected by herniorrhaphy (overlapping mattress sutures).

2.2. Surgical procedure

Pre-operatively, the animal was kept off feed and off water for 24 hours and 12 hours respectively.The calf was held in a dorsoventral posture while being routinely prepared for surgery. After sedating the animal intravenously with Diazepam (Sedil 2%; Square Pharmaceuticals, Bangladesh) at a dosage rate of 0.5 mg/kgbody weight, the surgical site was aseptically prepared by saving and using PovidonIodine 10% (Povisep, Jayson Pharmaceuticals Ltd., Bangladesh) and alcohol (70%) for three times. The calf was applied intravenously of 0.9% Normal saline (ACME Laboratories Ltd., Bangladesh). Later, for local regional analgesia, a ring block of 2% lidocaine hydrochloride (Jasocaine, Jayson Pharmaceuticals Ltd., Bangladesh) was performed around the umbilical area at a dosage of 10 mg/kg body weight (Figue 2). Later, the surgical area was covered with a window drap. Asterile gauze was used to clean the surgery site. The parietal layer of peritoneum and skin adhesions were released using elliptical skin incisions and blunt and sharp dissection, respectively.the small intestine segment that had been eviscerated was reinserted into the abdominal cavity through digital manipulation. The hernial rings was exposed, cleaned with saline water and eventually sealed with overlapping mattress sutures made mostly of No. 1-0 prolene. Extra mass was removed and after that the subcutaneous tissues had been continuously stitched with No. 1-0 prolene. The skin was then stitched with Silk in a simple interrupted suture pattern. The surgical site was again properly cleaned with 10% Povidone-

iodine (Povisep, Jayson Pharmaceuticals Ltd., Bangladesh) and ointment of5%ProvidoneIodinev (Viodin, Square pharmaceuticals Ltd., Bangladesh) was applied.

Figure 1: Clinical presentation of large swelling at the umbilical region of a female holstein friesian calf

Figure 2: Local infiltration of 2 % lidocaine hydrochlroride (jasocaine) as ring block pattern

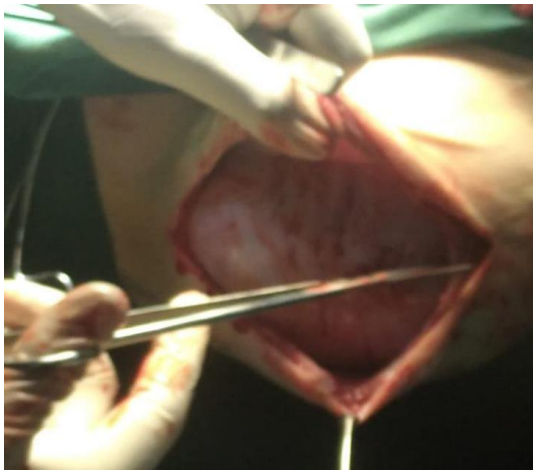

Figure 3: Blunt skin incision at the surgical site

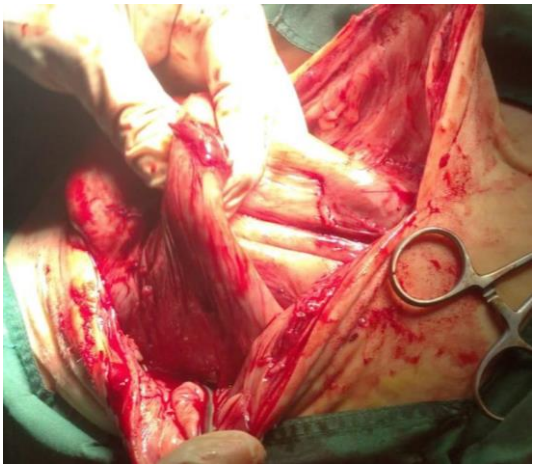

Figure 4: Exposing the hernia sac after incision

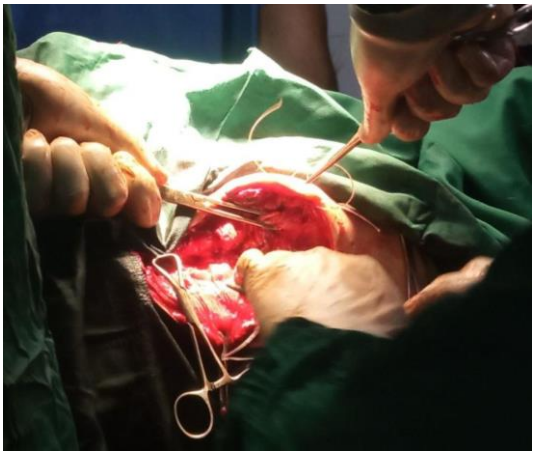

Figure 5: Herniorrhaphy of the hernial ring using prolene no. 1-0

Figure 6: Post-surgical presentation of corrected hernia.

2.3 Post-operative care

Post-operatively the wound was properly dressed twice daily for next seven consecutive days with 10% Povidone Iodineliquid (Povisep, Jayson Pharmaceuticals Ltd., Bangladesh) and with 5%Povidone Iodine ointment (Viodin, Square pharmaceutical Ltd., Bangladesh). To check any further bacterial infections injection Marbofloxacin at 10mg/kg body weight (Marbo vet,Eskayef Pharmaceuticals Limited, Bangladesh) was given intramuscularly (IM) for five successive days along with a non-steroidal anti-inflammatory drug Meloxicam at 0.5 mg/kg body weight (Melvet, The ACME Laboratories Ltd, Bangladesh) and antihistaminic preparation, pheniramine maleate (Hista Vet, ACI Ltd., Bangladesh) was administered IM (1 mg/kg BW) once daily for 3 days.

Chapter III: Result and Discussion

Sedation along with local regional anesthesia was performed and the anesthesia was effective enough to complete the surgery. After completing the surgery, Corneal and palpebral reflexes of the patient were back within 10 minutes.Pain sensation was regained in 15 minutes .The calf completely recovered from anesthesia within 40 minutes without any anesthetic hazard. A telephone survey was carried out up to 3 weeks posoperatively indicated that proper healing of the surgical site without any reoccurrence and no postoperative complication was recorded. The calf was good heath with normal appetite during post-operative period. Finally, the skin stitches were removed at 10^{th} day of post-operative period. Umbilical hernias are quite common in young calves. Similarly, in the current case report, umbilical hernia is seen in four-month old calf of Holstein Friesian cross breed. According to the current case report, umbilical hernia is presented in with a six inches' width. Hernias are made up of hernial sac, hernial ring, hernia contents which may be peritoneum, peritoneal fluid and visceral organs. The most common viscera involved in umbilical hernias in cattle are the abomasum with or without omentum. In this case omentum was found as hernia contents. Hernias may be small at birth and enlarge with age, so if needs clear differentiation from umbilical sepsis (Anderson et al. 2004). Naturally, umbilical opening in calf should be closed after birth within a few days. Partial or complete failure of this opening to close properly results in umbilical hernia and the causes of umbilical hernia might be either congenital or acquired factors which hamper this closure, such as omphalitis or abscesses (Al-Sobayil et al. 2007). From the case history and by palpation of the hernial area, the main diagnosis can be obtained (Jaman *et al*., 2018). Exploratory puncture of the bulge may be performed to detect the nature of contents of swelling. Ultrasonography may also be helpful to detect or rule out the infection status of the contents of hernia which will help to clarify the extent to which the internal umbilical structured are infected. Radiography such as plain and contrast may be helpful in identifying the hernia contents. In our case, the hernia was diagnosed on the basis of case history and clinical examination of swelled area.On palpation , the swelling was painless and reducible with a large hernia ring.No radiographical examinations were conducted in the current case. Umbilical hernia can be managed using different treatment options depend on the size of the hernial ring, content of the hernial ring and location of hernia. If smaller herinal rings occurs then it can be easily manged through application of bandage,

clamps, or ligatures.If the content of hernia is small intestine,then it should be repaired surgically as early as possible to prevent strangulation of intestine. Generally,surgical repair is conducted to obliterate the hernia sac and repair of the defect in abdominal wall (Shah et al. 2016). Herniorrhaphy should be applied in case of large hernial opening (more than 1 finger in size or if it persists for more than 3 to 4-weeks). In the Study, the width of hernia ring was 8 finger. That's why,the hernia was corrected by herniorrhaphy. Herniorrhaphy is commonly done under regional nerves block in through local analgesia in calves.Proper positioning of animal is important to facilitate reduction of hernial contents and herniorrhaphy. Local regional anaesthesia is most desirable procedure in many situation .In this study , local regional anesthesia along with sedation was used and found to be enough and effective.In case of extensive umbilical hernia it needs hernioplasty (Abdin-Bey et al. 2001). Absorbable sutures can be used in some cases where the size of the hernial ring is less than 4 fingers or if the hernia is less than 8-months old (Al Sobayil et al. 2007). Keeping off feed and off water of the surgical patient for 24 hours and 12 hours respectively will not only helpful for early healing of defect, but also reduces the chances of wound dehiscense.So, in this case ,the animal was kept off feed and off water for 24 hours and 12 hours respectively. During the post-operative period, animal movement should be restricted and should be confined for 2-4 weeks to stall feeding to prevent any wound dehiscense. Sudden swelling indicates signs of wound dehiscence and it should be treated accordingly. In this study, no postoperative complications were observed, but according to the literature, some complications may develop in case of umbilical hernias, which normally increases the complexity and expense to repair (Shah *et al*., 2016).

Chapter IV: Conclusion

In conclusion, surgical correction along with the administration of antibiotics, antihistamines and anti-inflammatory medication, is effective for the successful management of umbilical hernia. Accordingly, an umbilical hernia can be managed through herniorrhaphy using overlapping mattress sutures and can be recommended as an effective and satisfactory technique to manage umbilical hernia in calf.

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Biography

The author Hamida Akter, daughter of Md. Jamal Uddin and Firoja Begum passed her Secondary School Certificate (SSC) examination from Muchapur B.Z HighSchool, Sandwip, Chittagongin2015and Higher School Certificate (HSC) examination from Agrabad Mohila college, Chittagong in 2017. There after she enrolled for Doctor of Veterinary Medicine (DVM) degree in Chattrogram Veterinary and Animal Sciences University (CVASU), Bangladesh and Now, she is an Intern Student in this University.

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