Surgical Management of Umbilical Hernia in a Jersey Crossbreed Calf at Upazila Veterinary Hospital, Banskhali, Chattogram

A Clinical Report Submitted

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Abstract

There are many types of hernia that may happen in cattle but the most frequently noted in cattle is an umbilical hernia. The research confirmed that the umbilical hernia usually accrued 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 three-month-old Jersey crossbred calf weighing approximately 80 kg was presented to Upazila Veterinary Hospital, Banskhali, Chattogram, Bangladesh, 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 anti-histaminic and anti-inflammatory drugs post-operatively. The calf recovered without any reoccurrence after two weeks of surgery. This case report discusses the successful management of an umbilical hernia in a field veterinary hospital setting.

Keywords: Herniorrhaphy, Jersey crossbreed, Umbilical hernia

Chapter I: Introduction

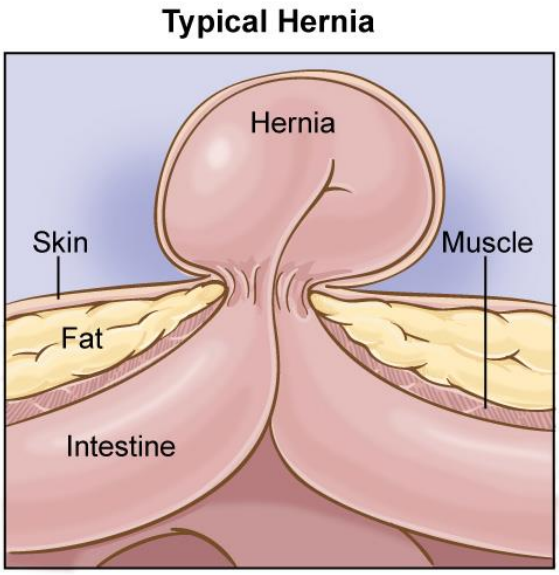

Figure: General Structure of a hernia (www.aviva.co.uk)

A hernia is when the contents of a bodily cavity protrude through a body wall's weak point. Possibly from either unintentional or a typical anatomical hole that does not achieve its physiological purpose entirely (Farman *et al*., 2018). The hernia can be reducible (manually or automatically return the hernial contents into the abdominal cavity) or irreducible (the hernial contents cannot be return into the abdominal cavity). According to their anatomical placements, 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) The hernia ring, hernia sac, and contents are the three anatomical components of a hernia. The abdominal wall, which is made up of muscles and ligaments and serves as a shield as well as having the natural function of carrying the abdominal contents, primarily the intestines, is where hernias most frequently occur in cattle. In claves umbilical hernias are most common which are normally secondary to failure of the normal closure of the umbilical ring (Fesseha, 2020). Furthermore, external trauma to the umbilicus, secondary umbilical sepsis, hereditary factors, inflammation and sepsis of the umbilicus, post-calving 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 thought to be the cause and predisposition (Kumar, 2001; Fesseha, 2020). Though all the breeds of cattle are susceptible, but it is more frequent in Holstein-Friesian, young (5-7 week) cattle's are more affected, and it is more common in female cattle than male cattle (Fesseha, 2020). Umbilical hernias may or may not present with symptoms. when they manifest clinically, which is typically soon after delivery. Additionally, if it is unstranagulated and uninfected, it typically causes little pain. The contents of most occurrences of umbilical hernias are the omentum, small intestine, or abomasum (Misk *et al.*, 2008; Kumar *et al.*, 2013). From the history and by palpating the hernial area, the main diagnosis was obtained (Jaman *et al*., 2018). However, in certain situations, an

exploratory puncture of the bulge and the display of intestinal contents serve to confirm the diagnosis. From the history and by palpating the hernial area, a main diagnosis was obtained. However, in certain situations, an exploratory puncture of the bulge and the display of intestinal contents serve to confirm the diagnosis (Jaman *et al*., 2018). It is treatable using a variety of medicinal and surgical procedures. The type and state of the hernia will determine the prognosis. Additionally, an early diagnosis and course of therapy can help an umbilical hernia heal more successfully. Simple umbilical hernias can be treated in a number of different ways or not at all. Many types of umbilical hernias have been proven to have a hereditary component; this should be taken into account when discussing therapy. However, infections of the umbilical opening have also been linked to hernias, which hinder the natural closure of the hole. The infection in this instance could simply be momentary, leading to an ostensibly straightforward hernia of noninheritable origin. Hernias can also be treated surgically in a number of ways depending on the size of the hernial ring at the site (Rings, 1995). Primary repair (Hernioraphy) is a surgical procedure that involves placing sutures in a straight line in the abdomen to treat simple hernias. Mesh repair (Hernioplasty) is a surgical procedure that uses networks to treat large and complex hernias and may involve using a laparoscope. A combination of primary and mesh is used in complex abdominal wall and hernia treatments (Sutradhar *et al*., 2009). However, despite the fact that this condition is quite common in the countryside but most of the farmers overlook it due to the limited treatment facilities in the rural areas. Thus, the objective of this study was the surgical management of an umbilical hernia in a calf in a field setting at Upazila veterinary hospital.

Chapter II: Materials and Methods

2.1. Case history and observation

A Jersy crossbred calf that was three months old and weighed around 80 kg was brought to the Upazila Veterinary Hospital in Banskhali, Chattogram, with a history of swelling in the umbilical area that had been there from birth but had recently gotten bigger. Reducible swelling that dangles around the umbilicus was discovered during the clinical examination (Figure 2A). The hernial ring measured four fingers in width. Other clinical measurements including heart rate, respiration rate, and rectal temperature were all within acceptable limits and the patient's overall health was good. Clinical examination led to the diagnosis of an umbilical hernia, which was treated with herniorrhaphy (overlapping mattress sutures).

2.2. Surgical procedure

The animal 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 0.4 mg/kg, the surgical site of the procedure was aseptically prepared. The calf was given intravenously of 0.9% normal saline (ACME Laboratories Ltd., Bangladesh). Later, for local analgesia, a circular local infiltration of 2% lidocaine hydrochloride (Jasocaine, Jayson Pharmaceuticals Ltd., Bangladesh) was performed in the umbilical area at a dosage of 10 mg/kg body weight. After shaving and using Povidone Iodine 10% (Povisep, Jayson Pharmaceuticals Ltd., Bangladesh), the surgical area was cleaned and covered. Afterwards, sterile gauze soaked in tincture iodine was used to clean the surgery site. The parietal peritoneum and skin adhesions were released using elliptical skin incisions and blunt and sharp dissection, respectively [2B]. Through digital manipulation, the small intestine segment that had been eviscerated was reinserted into the abdominal cavity. Before being sutured, the hernial rings were exposed, cleaned, and eventually sealed with overlapping mattress sutures made mostly of No. 2 chromic catgut [2C] (Surgigut; United States Surgical, USA). Extra skin was removed for better apposition after the subcutaneous tissues had been continuously stitched with No. 1-0 chromic catgut. The subcutaneous tissues were then stitched with nylon (Sutures India, India) in a simple interrupted suture pattern. The surgical site was again properly cleaned and dressed with 10% Povidone-iodine (Povisep, Jayson Pharmaceuticals Ltd., Bangladesh).

Figure 2A: Clinical examination and evaluation of hernial ring

Figure 2B: Skin incision and opening of the hernial ring

Figure 2C: Apposition of the skin with simple interrupted suture

Chapter III: Results and Discussion

3.1. Post-operative care and Results

For post-operative care the wound was properly dressed twice daily for next five consecutive days with 6% Povidone Iodine ointment (Povidone, Amico Laboratories Ltd., Bangladesh). To check any further bacterial infection a combination of β-lactam antibiotics at the dosage rate of 40000 IU/Kg body weight (Benzylpenicillin + Procaine Penicillin) and aminoglycosides at the dosage rate of 20mgKg body weight (Streptomycin) was given intramuscularly (IM) for five successive days along with non-steroidal anti-inflammatory drug (meloxicam) 0.5 mg/kg body weight (Melocam, Reneta Laboratories Ltd, Bangladesh) and antihistaminic preparation, pheniramine maleate (Asta Vet, ACME Laboratories Ltd., Bangladesh) was administered IM (1 mg/kg BW) once daily for 3 days. As a fly repellent Nim oil, Marigold oil, Mustard oil, Dedaru oil, Halud, Mongistha combination cream (Dressgel FR, ACME Laboratories Ltd., Bangladesh) was used for a week. After two weeks surgical site was properly evaluated, proper healing without any reoccurrence and other complication was recorded and finally, the skin stitches were removed 14th day post-operative.

3.2. Discussion

The urachus, a tube connecting the fetal bladder to the placental sac, and the other umbilical veins, which carry blood between the fetus and its mother, make up the umbilicus in newborn calves (Sutradhar *et al*., 2009). Normally, these structures vanish shortly after birth, leaving only a few microscopic fragments in the abdomen (belly). An umbilical hernia may arise if abdominal contents protrude via a hole in the body wall where these structures formerly flowed through (Virtala *et al*., 1996). Young calves frequently exhibit umbilical hernias. The extent of the umbilical defect and the volume of abdominal contents it contains both influences the hernia's size. There are a number of harmful outcomes associated with this form of affliction, including a decrease in the production and reproductivity of the affected animals. Various literatures have described the origins of this affection, which are mostly of two types: congenital and acquired (Virtala *et al*., 1996; Fesseha, 2020). Given that this was seen from the moment of birth and there was no sign of any harm, the cause, in this case, may be congenital. In this case study, the calf underwent surgery, and two weeks later, it recovered successfully and without any issues. Surgery

involving intestinal evisceration in calves has a good prognosis. Rectal temperature, pulse rate, and respiration rate were all determined to be normal in the current case, indicating that the calf's physiological state was normal. The present case was reported in the Jersey crossbreed calf, but this condition was most frequently recorded in Holstein Frisians (Prasad *et al*., 2017; Mishra *et al*., 2020). The instance was discovered in a female calf of a cow. This finding is in accordance with previous studies where they also recorded higher incidence in female claves (Prasad *et al*., 2017). In contrary, Jaman *et al*.,2018 reported that newborn male calves are more likely to have the disease (Jaman *et al*., 2018). In the present case, the umbilical hernia was corrected through herniorrhaphy. Several publications have also recommended herniorrhaphy for big hernial openings (larger than the size of a finger or if they continue longer than 3 to 4 weeks), although hernioplasty is necessary for extensive umbilical hernias (Abdin-Bey and Ramadan, 2001; Kumar *et al*., 2014; Fesseha, 2020). The aim of the surgical procedure was to close the abdominal wall defect and remove the hernia sac. If the hernial ring is no larger than four fingers or if the hernia is less than eight months old, absorbable sutures may be employed. In this present study, no postoperative complications were observed, but according to the literature, complications may develop in congenital umbilical hernias, which can significantly increase the complexity and expense to repair (Shah *et al*., 2016).

Chapter IV: Conclusion

In conclusion, surgical management along with the administration of antibiotics, antihistamines and anti-inflammatory medication, is effective for the successful management of umbilical hernia. Accordingly, herniorrhaphy using overlapping mattress sutures can be recommended as an effective technique with limited facilities in the field setting.

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Biography

Myself Priyanka Das, daughter of Nepal Kanti Das and Ranjita Das. I was born on 30th November 1996. My home district is Banskhali, Chattogram. I passed my Secondary School Certificate examination in 2013 and gained a GPA of 5.00. I completed my Higher Secondary Certificate in 2015 from Govt. Haji Muhammad Mohsin College, Chattogram, where I achieved a GPA of 5.00. I am interested in volunteering, blood donation, painting, recitation, anchoring, photography etc., other than my academics. In future, I would like to work for the well-being of animals and pursue my dream career as a practitioner and researcher.

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