



SURGICAL MANAGEMENT OF UMBILICAL HERNIA IN CROSSBRED HOLSTEIN-FRIESIAN CALF

K.C. Dehury¹, S. Sathapathy^{2*}, S. K. Joshi³, C. B. Mishra⁴, I. Ali⁵ and H. K. Behera⁶

¹Department of ARGO, ²Department of Anatomy and Histology, ⁴Department of Pharmacology and Toxicology, ⁵Department of Veterinary Pathology and ⁶Department of Veterinary Clinical Medicine, C.V.Sc. and A. H., OUAT, Bhubaneswar – 751 003

³Scientist (Animal Science), KVK, Jharsuguda, OUAT

*Corresponding author email: srinivas42.sathapathy@gmail.com

ABSTRACT

Four months old crossbred Holstein Friesian calf was presented with the history of a long standing swelling present at the ventral abdominal wall at the point of umbilicus which was present since birth. Although the appetite and water intake was reported to be normal, only scanty faeces were voided out at some point of time. Clinical parameters were within the normal physiological limits. On palpation it revealed very big size of oval hernial ring including umbilicus and it was reducible type of hernia. So, it was surgically corrected by open method of herniorrhaphy by applying horizontal interrupted mattress sutures. Animal recovered uneventfully without any complications.

KEY WORDS: Surgical, management, umbilical hernia, Holstein-Friesian, Calf.

INTRODUCTION

A hernia occurs when part of an internal organ bulges through a weakened muscle, tissue, or membrane that would normally contain it (Arsdall, 2011). An umbilical hernia is a discontinuity of the abdominal wall at the umbilicus with protrusion of abdominal contents into hernia sac formed by the skin and surrounding connective tissue (Vineet *et al.*, 2014). Hernias in cattle appear to be controlled by an autosomal gene with variable penetration (Manoj and Dhana Lakshmi, 2015). Hernias can be either congenital or acquired and can occur either through natural openings or induced ones. In calves, the most common form of hernia is the umbilical hernia where portions of the abdominal contents protrude out through the natural opening in the ventral abdomen left by the umbilicus. Umbilical hernias in calves may be more common in the Holstein-Friesian breed. While many calves can live with umbilical hernias without any problems, there is a risk that a loop of intestine can slip through the opening and become twisted. This is referred to as a strangulated hernia and it is a surgical emergency. Umbilical hernia occurs in all domestic animals but more common in foals, calves and pups (Priester *et al.*, 1970). It is one of the major surgical affections in crossbred calves, with incidence of 4-15% as reported by Virtala *et al.* (1996). Changes in the function of both the body cavity and the herniated contents can be important in herniation. These changes may be insignificant but in some cases may result in serious pathophysiological consequences that can lead to acute severe illness and in some cases lead to the death of the animal (Brissol, 2004). The umbilicus in newborn calves consists of the urachus, a tube that connects the fetal bladder to the placental sac, and the

remnants of the umbilical vessels that transported blood between the fetus and its mother. Normally, just after birth, these structures shrink until only tiny remnants remain within the abdomen. If bacteria gain entry through the umbilicus, however, those remnants can become infected and require surgical removal. Additionally, if the area in the body wall through which these structures passed remains open, the intestines can protrude through the defect, resulting in an umbilical hernia. Umbilical hernias are the most common birth defect in calves and may be more common in the Holstein-Friesian breed. The size of an umbilical hernia can differ greatly, based on the size of the opening of the umbilical ring and the amount of abdominal contents that have protruded through this opening. If the hernia is less than one to three cm in diameter, and/or if the contents of the hernia are easily reducible, it is likely that the hernia is not severe and will heal spontaneously. A hernia that is less than four to five cm (or less than three fingers wide) can likely be resolved by wrapping an elastic bandage over the belly to keep the contents in once they have been put back in place. However, the larger the hernia sac, the more likely it is that the umbilical ring opening is large, and increasing the odds of surgical repair becoming necessary. As a rule of thumb, if the hernia sac/opening is more than six cm, can't be replaced easily into the abdomen, persists for several weeks, and/or is infected, it is considered severe and you should contact your herd veterinarian to have it assessed. It is also possible for an umbilical hernia to develop into a strangulated hernia. This happens when the intestines, which are part of the abdominal contents contained in the hernia sac, become twisted outside the body. Symptoms of a strangulated hernia include a warm, swollen, firm and

painful hernia sac accompanied by signs of colic such as grinding teeth, grunting, arching back, shifting weight, restlessness, depression *etc.*

The present communication aims to record a case of umbilical hernia in a calf and its successful surgical management.

Etiology

Umbilical hernia is the most common form of congenital defect in calves. It appears that Holstein-Friesian breed cattle are more commonly affected. An umbilical hernia forms when the opening in the ventral abdomen through which the umbilicus protrudes (the umbilical ring) fails to close properly after birth. Some factors that can increase the likelihood of this happening are cutting the umbilicus off close to the body wall, and excessive traction being applied to an oversized fetus during delivery. A strangulated hernia develops when a loop of intestine slips through the umbilical ring and twists on itself, thus cutting off the blood supply to the tissue. The section of bowel is usually a loop of small intestine but it can be cecum or large colon, too.

Case history and clinical signs

A four months old crossbred Holstein Friesian calf was presented with the history of a long standing swelling present at the ventral abdominal wall at the point of umbilicus which was present since birth (Fig. 1). Anamnesis suggested that the swelling tends to increase in size as the calf gradually grows. Fine needle aspiration was done to differentiate it from abscess or tumour.

Although the appetite and water intake was reported to be normal, only scanty faeces were voided out at some point of time. Clinical parameters like heart rate, respiratory rate and rectal temperature were within the normal physiological limits. On palpation it revealed very big size of oval hernial ring including umbilicus and it was reducible type of hernia. So, it was planned to perform herniorrhaphy. Strangulating hernias are painful because the blood supply to the affected segment of bowel is compromised. This condition traps gas within the twisted segment and if left untreated, the segment will eventually die due to a lack of blood flow. The signs associated with a strangulated umbilical hernia include a warm, swollen, firm and painful hernia sac accompanied by signs of colic.

Diagnosis

Calves are physically examined to try to reduce the herniated contents. In some instances, it is possible to palpate an infected stalk within the hernia sac or around the umbilicus. Sedation may be required to place the calf on their back or side to better feel these structures. Ultrasound examination is useful in determining extent of infection in the herniated contents. Laboratory work such as white blood cell counts or fluid collection from the mass for a bacterial culture can also be useful detecting infection. Diagnosing a strangulated umbilical hernia can be done by observing signs such as a swollen, painful, firm umbilical sac along with fine needle aspiration of the swelling to differentiate it from an umbilical abscess.

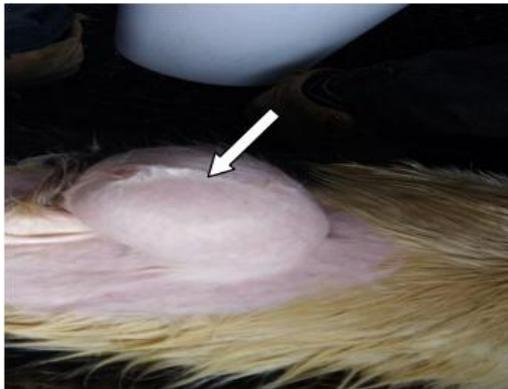


FIGURE 1. Figure showing umbilical hernia (Arrow) in a crossbred Hostein-Friesian calf



FIGURE 2. Figure showing the cut open of the umbilical herniated mass in a crossbred Hostein-Friesian calf



FIGURE 3. Figure showing herniorrhaphy in a crossbred Hostein-Friesian calf affected with umbilical hernia

Treatment

Food and water were withheld 12 hrs before surgery. The operation was performed in lateral recumbency. After aseptic preparation of the surgical site, 2% lignocaine was infiltrated locally at operative site. After proper analgesia, an elliptical incision was made exactly (Fig. 2) on the swelling avoiding blood vessels and umbilicus (Baird, 2008). By blunt dissection muscles and peritoneum were separated. Caution should be taken with location of the skin incision to ensure adequate skin remains to allow skin closure without tension. The subcutaneous tissue is dissected around the umbilical mass until the glistening white external sheath of the rectus abdominis muscle is exposed. A small body wall incision (just large enough for the surgeon to insert a finger into the abdominal cavity to palpate for any structures associated with the mass) is made on the midline either cranial or caudal to the mass. Intestines were found as hernial contents. There were no adhesions and contents were replaced into the abdominal cavity. The hernial ring edges were freshened and closed by taking overlapping mattress sutures. The hernial sac and extra skin was trimmed. The subcutaneous tissue is closed with absorbable suture in a simple continuous pattern. The skin closure may be done in a simple continuous pattern using non-absorbable suture (Fig. 3).

Post-operative care

The main concern was focused to prevent the possible toxemia, to alleviate the inflammatory pain and to check the secondary infections or complications. Dextrose saline 5% (1 lit/day) was continued intravenously for 3 days after operation to reduce the risk of toxemia. Ceftriaxone @ 10mg/kgbw, Meloxicam @ 0.3mg/kgbw, DNS (5%) and Vitamin B complex were given for 5 days following operation to prevent the bacterial infection and pain respectively. Daily dressing of the suture line was performed with 5% povidone iodine until healing of the surgical wound. Temperature, respiration, pulse and other related physical examinations were recorded regularly. On the 10th day, the suture of the skin was removed and it was noticed that the wound had healed completely. The appetite and general appearance of the animal was satisfactory with apparent signs of recovery.

DISCUSSION

For simple hernia repairs antibiotics are often given only at the time of surgery. However, if there is an extensive infection, a longer course of antibiotics may be necessary. Non-steroidal anti-inflammatory drugs are useful for reducing pain, but should be used cautiously since they can cause abomasal (stomach) ulcers if given too long. After surgery, the calf should be slowly re-introduced to feed and confined, to some extent, to prevent tension on the surgical repair. Prognosis is favorable for recovery, especially for simple hernias or minor infections. Calves that have infected umbilical vein remnants extending towards the liver are at an increased risk of peritonitis (infection of the abdominal cavity) and therefore have a poorer prognosis. Umbilical hernias are defects in the abdominal wall that result in a round swelling at the point where the umbilical cord enters the body. Due to improper closure of the umbilicus opening at birth or from mal development or hypoplasia of the

abdominal muscles (Singh *et al.*, 1989) a defect may remain in the mid ventral line to form a congenital hernial ring. It appears if complete failure of closure without narrowing of large umbilical opening of early embryonic life occurs and this opening persists even after birth, the abdominal viscera are likely to pass through this large persistent opening. This condition results in passage for prolapse of visceral mass. The congenital umbilical hernias with similar finding were reported by Mistry *et al.* (2003). Various scientists (Brem *et al.*, 1985; and Singh *et al.*, 1989) reported high incidence of umbilical hernia in female calves as compare to male calves, whereas Das and Hashim (1996) and Rahman *et al.* (2001) reported low incidence in females as compare to male calves. It is generally accepted that a genetic component is involved in congenital umbilical hernias, but the hypotheses on the mode of inheritance are rather conflicting (Herrmann *et al.*, 2001). The best treatment option depends on a number of factors including the size of the hernia, the size, age and future purpose of the animal. Conservative treatment includes belly bandages and daily irritation of the hernia to encourage closure. As a general rule, only smaller hernias (those less than 2 fingers wide or 5 cm), then surgical correction may be necessary to restore integrity of the abdominal wall and prevent incarceration and strangulation of herniated contents (Kumar *et al.*, 2012). In the present study also surgical correction was carried out and the animal made uneventful recovery.

CONCLUSION

Umbilical hernia was treated successfully with herniorrhaphy in a HF cross bred calf. Prompt surgical intervention is the only treatment of choice for corrections of these defects to prolong the life of the patient. Delayed response and ineffective treatment may lead to serious complications which may ultimately lead to the death of the animal. Preventing a strangulated inguinal hernia can be accomplished by repairing an umbilical hernia before any bowel has a chance to become strangulated inside the hernia sac. Repair of umbilical hernias can be attempted surgically and non-surgically. Non-surgical repair involves reducing any herniated abdominal contents and then placing an elastic bandage around the belly to keep the contents in their normal place long enough for the umbilical ring to close by itself. Surgical repair requires freeing any contents of the umbilical sac, reducing them, and suturing the umbilical ring shut.

ACKNOWLEDGEMENT

The Authors are very much thankful to the faculties of Department of Anatomy and Histology, Department of Pharmacology and Toxicology, Department of Veterinary Pathology and Department of Veterinary Clinical Medicine, C.V.Sc. and A.H., OUAT, Bhubaneswar for their kind cooperation and necessary guidance throughout the surgery.

REFERENCES

Arsdall, D.V. (2011) Umbilical Hernia/Strangulated Hernia. *Calfology*. <http://calfology.com>, visited on 29.07.2017.

- Baird, A. N. (2008) Umbilical Surgery in Calves. *Vet Clin Food Anim.* **24**: 467-477.
- Brem, G., Hondele, J., Disti, O. and Krausslich, H. (1985) Investigation of the Occurrence and Causes of Umbilical Hernia in German Brown Calves. *Tierärztliche Umschau.* **40**: 877-882.
- Brissol, H. N., Dupre, G. P. and Bouvy, B. M. (2004) Use of Laprotomy in a Stage Approach for Resolution of Bilateral or Complicated Perineal Hernia in 41 Dogs. *Vet. Surg.* **33**: 412-421.
- Das, B. R. and Hashim, M. A. (1996) Studies on Surgical Diseases in Calves Bangla. *Vet. J.* **30**: 53-57.
- Herrmann, R., Utz, J., Rosenberger, E., Doll, K. and Distl, O. 2001. Risk Factors for Congenital Umbilical Hernia in German Fleckvieh. *Vet. J.* **162**: 233-240.
- Kumar, V., Kumar, N., Gangwar, A. K., Sharma, A. K., Singh, H., Saxena, A. C., Negi, M. and Kaarthick, D.T. 2012. Acellular Dermal Grafts for the Reconstruction of Umbilical/Ventral Hernias in Buffalo Calves. *Vet. Practitioner.* **13** (1): 12.
- Manoj, K. and Dhana Lakshmi, N. 2015. Surgical management of umbilical hernia in a HF cross bred calf: A case report. *Int. J. Agric.Sc & Vet.Med.* **3**(4): 20-23.
- Mistry, J.N., Patel, P.B., Suthar, D.N. and Patel, J.B. (2009) Surgical Repair of Congenital Vento-Umbilical Hernia in a Crossbred Calf. *Intas Polivet.* **10**(2): 223-224.
- Priester, W.A., Glass, A.G. and Waggoner, N.S. (1970) Congenital Defects in Domesticated Animals: General Consideration. *Am. J. Vet. Res.* **31**: 1871-1879.
- Rahman, M.M., Biswas, D. and Hossain, M.A. (2001) Occurrence of Umbilical Hernia and Comparative Efficacy of Different Suture Material and Techniques for its Correction in Calves. *Pakistan J. Biolo. Sci.* **4**: 1026-1028.
- Singh, A. P., Eshoue, S. M., Rifat, J.F and Falehea, N.G. (1989) Hernia in Animals: A Review of 59 Cases. *Indian J. Vet. Surg.* **10**: 28-31.
- Vineet Kumar, Mathew, D.D., Ahmad, R.R., Hoque, M., Saxena, A.C., Rekha Pathak and Amarpal (2014) Sterilized Nylon Mosquito Net for Reconstruction of Umbilical Hernia in Buffaloes. *Buffalo Bulletin.* **33**(1): 8-12.
- Virtala, A.M.K., Mechor, G D., Grohn, Y.T. and Erb, H. N. (1996) The Effect of Calf hood Diseases on Growth of Female Dairy Calves During the First 3 Months of Life in New York State. *J. Dairy Sci.* **79**: 1040-1049.