

Research Article

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Umbilical Hernia in Calves in Sylhet Region, Bangladesh

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Abstract

Keywords

Umbilical,
hernia,
sex,
breed and season.

The study was conducted from three established Government Veterinary Hospitals when we have performed our internship duty in those hospitals. The present investigation was conducted on several affected calf patient those were come in hospital for their disease complication. In those patient hernia affected animal were 25, that we have found in 8 months of our study (8th December to 5th July, 2015) out of 25 calves affected with umbilical hernia, 8 were indigenous (local) and 17 were crossbred. Sixteen of the animals were male, 9 were female. Ages ranged from 3 days to 6 months. The effect of age, sex, breed and season on the occurrence of umbilical hernia in calves was investigated. Calves of 1-3 months age group demonstrated the highest incidence (24%) while those of 3-6 months the lowest (12%). Umbilical hernia occurred mostly in male calves (12%) as compared to their female counter parts (20%). The cross bred calves were predominantly (68%) affected as compared to the indigenous (32%). Umbilical hernia was the most prevalent in the summer (60%) and the lowest in the winter (8%).

Introduction

Diseases and disorder of calves are thought to be the important constraints for cattle development in Bangladesh. It has been reported that 15-20% calves die every year from various diseases (Anon, 1993). Congenital disorder in calves has been increasing alarmingly with the increase of crossbred animals. Umbilical hernia and atresia are the major congenital disorders causing mortality in calves. Genetic or environmental factors or their interactions cause congenital defects, and these anomalies are abnormalities of structure or function present at births (Leipold *et al.*, 1983). Umbilical hernia is one of the

major congenital affections in animals particularly in the bovine. It also occurs in foals and pups (Priester *et al.*, 1970). In cattle the condition is comparatively more frequent in Holstein-Friesian breed (Zhigachev, 1983). Congenital defects and disorder of domestic animals cause considerable economic loss to farmers. Improper closure of the umbilicus at birth due to mal development or hypoplasia of the abdominal muscles has been found to be associated with umbilical hernia in calves (Singh *et al.*, 1989). The acquired umbilical hernia occurs primarily due to manual breaking or re sectioning of the cord close to the abdominal wall.

A hernia is the protrusion of abdominal contents through an opening in the body wall. 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. 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.

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. Although inguinal hernia is not common in the bull, it is a condition which requires diagnosis and surgical treatment if the bull is to be kept as a herd sire. In early cases the presence of the intestine in the scrotum may be rather difficult to diagnose in very fat bulls due to the excess amount of fat that is present around the neck of the scrotum and it is not until the intestine is well down into the scrotum that a definite diagnosis can be made. This congenital defect may prove dangerous if not treated in appropriate time. The affected calves may only be salvaged through successful herniorrhaphy. Many factors e.g., suture materials, suture pattern, degree of protrusion; body circumference, ring diameter etc. determine the success of herniorrhaphy (Peacock and Van Winkle, 1976). Suture materials are selected on the basis of their physical biological properties, condition of the wound and healing characteristics of the tissue to be opposed. Polypropylene is one of the potent secured knotable, flexible synthetic non absorbable suture materials frequently use in human practice. Horizontal mattress and purse string suture patterns with catgut and silk are widely practiced in Bangladesh (Rahman *et al.*, 2001).

Considering our experimental study we have found following objectives:

1. To investigate the cases related to age, sex, breed and season on the occurrence of hernia in calves.
2. To study the surgical procedure for the correction of hernia in calves.

Materials and Methods

Study area

The study was conducted on 3(three) established Government Veterinary Hospitals in Sylhet, Bangladesh. The names of hospitals are:

1. District veterinary hospital, Sylhet.
2. Upazilla veterinary office, Fenchugonj, Sylhet.
3. Upazilla veterinary office, Biswanath, Sylhet.

Study Time

This study was undertaken by 8th December to 5th July in 3(three) established Government Veterinary Hospitals.

Methods of collected data

The majority of the owners were illiterate followed by some with primary level of education. It was difficult to find out the case history but we could try our best level to collect the require information to diagnosis the hernia case by cross questions the owner.

Data collection was made through questionnaire method and also collected from record book. In our study area found both local and exotic breeds of calf, so those breed were came in hospital for their several difficulties and data were recorded from those affected calf.

Results

Experimental animals

The present investigation was conducted on several affected calf patient those were come in hospital for their disease complication. In those patient hernia affected animal were 25, that we have found in 8 month of our study (8th December to 5th July) out of 25 calves affected with umbilical hernia, 8 were indigenous (local) and 17 were crossbred. 16 of the animals were male, 9 were female. Ages ranged from 3 days to 6 months and body weights from 40 to 150 kg(Both breed). A total of 25 were performed in these animals to investigate the

comparative efficacy of different suture materials for the correction of umbilical hernia. The work was carried out at the established Government Veterinary Hospital, Bangladesh. Near about 8 months of our

study, we were found several herniated case, and we have represented here my case study in following table.

Table no. 1: Examination of the calves and identification of the hernial affected calves by observing the clinical sign in our study area.

| Month | No. of calves examined | Hernia affected calves | Clinical sign |
|--------------|------------------------|------------------------|--|
| December | 20 | 7 | Presence of hernial swelling, hernial ring, severe pain, swelling is increase in size when coughing, fever |
| January | 23 | 6 | Presence of hernial ring, severe pain, fever |
| February | 30 | 5 | Presence of hernial ring, severe pain, fever |
| March | 20 | - | - |
| April | 15 | 3 | Presence of hernia swelling, colic, pain, fever, loss or body growth, loss of feed intake. |
| May | 22 | 2 | Presence of adhesion, incarceration, torsion, pain |
| June | 15 | 1 | Presence of hernia ring, fever, pain |
| July | 13 | 1 | Presence of hernia ring |
| Total | 158 | 25 | |

Effect of age

Calves between 1 and 3 months were most frequently affected with umbilical hernia. However, the disease is more prevalent in calves of below 1 month and less prevalent in 5-6 months of age. In Bangladesh, diagnosis of the affection may be delayed because

animals are reared in backward system and owners are either ignorant or have less interest for their management. In case of calves mostly umbilical hernia is common phenomenon. We have differentiated hernial case percentage (%) in different level of age out of total no of affected animals (no. 25).

Table no. 2: Effect of age on the occurrence of umbilical hernia in calves which is shown in the following table.

| Sl. No. | Age of calves | No. of affected calves | Affected Percentage (%) |
|--------------|-------------------|------------------------|-------------------------|
| 1. | 3 days-15 days | 6 | 0.24 |
| 2. | 15 days-1 months | 4 | 0.16 |
| 3. | 1 months-2 months | 2 | 0.8 |
| 4. | 2 months-3 months | 4 | 0.16 |
| 5. | 3 months-4 months | 3 | 0.12 |
| 6. | 4 months-5 months | 3 | 0.12 |
| 7. | 5 months-6 months | 3 | 0.12 |
| Total | | 25 | 1.00 |

Effect of breed

The hernia has been reported to be hereditary in origin. In the present study the affected rate is higher in the crossbreed than that in the indigenous breed. The higher affected rate in cross breed calves due to preference of owners to inseminate their cows with these breeds. Pure Holstein cattle as well as the

offspring of Holstein, indigenous cross are more likely to suffer from this congenital defect than the indigenous breed. The effect of breed on the occurrence of umbilical hernia in calves is shown in table no. 3. Among the 25 affected calves, 8 were indigenous and 17 were cross breed, the affected percentage 0.32 and 0.68 respectively.

Among the indigenous calves 0.12% male and 0.2% female were affected by umbilical hernia. Among the

cross breed calves 0.48% male and 0.20% female were affected by umbilical hernia.

Table no.3: Effect on breed on the occurrence of umbilical hernia in calves

| Breeds | Occurrence of umbilical hernia | | |
|---------------|--------------------------------|-----------------------|-------------|
| | Male percentage (%) | Female percentage (%) | Total (%) |
| | 15 | 10 | |
| Indigenous8 | 3 0.12 | 50.20 | 0.32 |
| Cross breed17 | 120.48 | 50.20 | 0.68 |

Effect of season

The effect of season on the occurrence of umbilical hernia in calves is presented in Table 4. The disease was found to occur throughout the year. The highest

affected percentage (60%) was found in the summer season while the lowest affected percentage (8%) was found in the winter season. The affected rate of the disease in the rainy season was (20%).

Table no.4: Effect of season on the occurrence of umbilical hernia in calves
(Source: Record book of Different Livestock Offices)

| Seasons | Occurrence of umbilical hernia | | |
|--------------------------|--------------------------------|-----------------|-----------|
| | Male (%) | Female (%) | Total (%) |
| Winter (October-January) | 0.4(1male) | 0.4(1 female) | 0.08 |
| Summer (February-May) | 0.44(11 male) | 0.16 (4 female) | 0.60 |
| Rainy (June-September) | 0.20 (5 male) | 0.12 (3 female) | 0.20 |

Discussion

Hernia is defined as the protrusion of an organ or a part of an organ or tissue through a defect in the lining of the cavity within which it is normally enclosed (Read, 1985). A hernia is the protrusion of an organ or tissue through an opening. The opening may be one caused by a tear in the abdominal wall or it may be a natural opening like the inguinal canal or femoral canal. A hernia is different from a prolapsed. In a prolapsed the protruded tissue is exposed outside whereas in a hernia it is covered by the skin (Venugopalan, 2000).

The umbilical opening in the fetus allows the passage of the urachus and umbilical blood vessels. At birth, these structures are disrupted or severed and umbilical opening closes around the cord. The wound heals by cicatrization and represents umbilicus in the later life. Due to improper closure of the umbilical opening at birth or from mal development or hypoplasia of abdominal muscles, a defect may remain in the mid-ventral line to form a congenital hernia ring. The acquired umbilical hernia occurs primarily due to manual breaking or re sectioning of the cord too close to the abdominal wall. Excessive straining due to

diarrhea or constipation or infection of the cord preventing natural closure of the umbilical orifice may also result in an umbilical hernia (Krishnamurthy, 2002).

Constituents of hernia

A hernia consists of the hernial ring, sac and contents. The ring may be formed due to a rupture in the abdominal wall (ventral hernia), limiting wall (diaphragmatic hernia) or due to a persistent prenatal opening (umbilical hernia). The hernial sac is made of tissues that enclose the hernial contents. The wall of the sac usually contains the skin, muscular fibers, fibrous tissue and parietal peritoneum. The hernial sac is absent in case of diaphragmatic hernia. The contents of hernia include the organ (a loop of bowel) or tissue (omentum) or both (Krishnamurthy, 2002). The hernia is regarded as consisting three portion: a hernia sac formed by skin, subcutaneous tissue, and invaginated peritoneum; hernia contents which usually comprises a loop of bowel or omentum or both or rarely ring or orifice, an opening in the abdominal wall which may be natural or acquired through which hernia contents protrude (McIlwraith, 1984).

Etiology of hernia

Predisposing causes

Roberts, 1999 described the predisposing cause of hernia that, imperfect closure of an embryonic defect, e.g. imperfect closure of umbilicus predisposing to an umbilical hernia, imperfect formation of the diaphragm predisposing to a diaphragmatic hernia. Venugopalan, 2000 stated that the predisposing cause of hernia, weakness of the abdominal wall due to contusions, local inflammation, etc.

Exciting causes

Venugopalan, 2000 described the exciting cause of hernia that, direct violence due to falling on a blunt object is the cause of hernia. O'Connor, 1980 also described the exciting cause of hernia that, increase in the intra-abdominal pressure due to straining from constipation, diarrhoea, during parturition, violent coughing, gastric or intestinal tympani.

Symptoms

According to Angus and Young, 1972 the physical symptoms of hernia are:

1. Presence of the hernial swelling.
2. The swelling varies in size and shape.
3. On manipulation it characteristic consistency depending on the contents. For example, the consistency is elastic in enterocele and doughy if epiplocele.
4. The swelling may increase in size while cough.
5. Roberts, 1999 during his work described the symptoms of hernia that are:
6. Functional symptoms are ordinarily absent in reducible hernia.
7. Colic is seen in incarcerated hernia.
8. Severe pain, rise of temperature and colic are pronounced in strangulated hernia.

Risk factors for umbilical hernia

Umbilical hernias or Omphalocele are not uncommon in domestic animals. Congenital umbilical hernia is common abnormalities in some animal species. Yet the epidemiological factors of the two conditions are not clearly understood (Priester *et al.*, 1970). An analysis of patient register of Bangladesh Agricultural University Clinic depicts on incidence of umbilical hernia in calves to be 1.85 % (Samad *et al.*, 2002).

(Hermann *et al.*, 2001) reported 1.85% and 0.56 incidence of umbilical hernia in Germany and Brazil respectively.

Effects of age

Most acquired hernias developed about 3-4 weeks of age (Keown, 1976). Umbilical hernias mostly occurred between 1 and 3 months of age while calves below 1 month and those above 3 months are less commonly affected (Fretz *et al.*, 1983, Gadre *et al.*, 1989 and Rahman *et al.*, 2001).

Effect of sex

The incidence of the disease in the female calves has been reported to be more frequent as compared to the male counterparts (Hayes, 1974). Female are at high risk for congenital umbilical hernia in cattle, horses and dog but in horses and swine, males are at excess risk for congenital inguinal hernia (Howard and Hayes, 1974). Male calves were found to be mostly affected for umbilical hernia than female calves (Das and Hasim, 1996). Higher prevalence in males may be due to large swelling at umbilical region for perpetual sheath. During development of such large perpetual sheath, the ventral abdominal wall may not be properly developed and leads to be formation of hernia ring before birth. Moreover, navel infection after birth in male calves may be more frequent due to continuous moistening by urine (Rahman *et al.*, 2001).

Effect of breed

Umbilical hernias are hereditary in cattle, horses and swine. Most cases of umbilical hernia in horses are due to improper handling of the foal at birth. This includes manually breaking the cord instead of allowing it to break naturally and ligating the cord instead of leaving it untied (Roberts, 1999). The occurrence of the disease was highest in cross-bred calves (Rahman *et al.*, 2001).

Effect of season

Umbilical hernia predominantly occurs in the summer (March-June). Its occurrence, however, declines in the winter (Brem *et al.*, 1992, Rahman *et al.*, 2001, Samad *et al.*, 2002).

Conclusions

Umbilical hernia in calves is fairly prevalent in our study area. Umbilical hernia occurred mostly in calves of 1-3 month age group. The affected rate of umbilical

hernia is more common in male calves than that in female calves. The higher affected rate of umbilical hernia was encountered in the cross breed calves in contrast to indigenous calves. This disorder is more prevalent in the summer season (February-May). Polypropylene appears to be the most effective suture material for the umbilical herniorrhaphy in calves. No bull having suffered from umbilical hernia should be used for breeding purpose, as these might transmit the autosomal recessive gene responsible for congenital defects. After operation, the animals were kept in a comfortable position; never in dorsal recumbancy. The tongue were placed out to avoid breathing difficulties, if the animal unless completely recovered from general anaesthesia. If the weather was cold preserve the body temperature by covering the body. While the patient recovering from the anaesthesia, most animals struggle and if this were severe a tranquilizer administered, if necessary. Do not give water to an animal recovering from anaesthesia because aspiration pneumonia might be caused due to difficulty in swallowing. Check the temperature, pulse, respiration periodically. Change the position of the animal every 30 minutes to avoid hypostatic congestion. Postoperative complications like stitch abscess, haemorrhage, myiasis, peritonitis, recurrence etc. may be observed. Once the recurrence occurs, the prognosis is not satisfactory in maximum cases, which ultimately leads to death of the animal.

References

- Angus K and Young GB 1972. A note on the genetics of umbilical hernia. *Veterinary Record*. 90: 145-226.
- Anon 1993. Economic reviews, Livestock Sub-sector, Directorate of Livestock Services, and Bangladesh. Pp. 456-470.
- Brem G, Hondele J, Distl O and Hrausslich H 1992. Investigation of the occurrence and causes of umbilical hernia in German brown calves. 40: 877-882.
- Das B R and Hasim M A 1996. Studies on surgical diseases in calves. *Bangladesh Veterinary Journal*. 30: 53-57.
- Fretz PB, Hamilton GF, Barber SM and Ferguson J G 1983. Management of umbilical hernia in cattle and horses. *Journal of American Veterinary Medical Association*. 183: 550-552.
- Gadre KM, Shingater RK and Ponchabhai VS 1989. Biometry on umbilical hernia in cross breed calf. *Indian Veterinary Journal*. 66: 989.
- Herrmann J B 2001. Tensile strength and knot security of surgical suture materials. *American Journal of Veterinary Research*. 37: 209-211.
- Hayes H M 1974. Congenital umbilical and inguinal hernia in cattle, horses, swine, dogs and cats: risk by breed and sex among hospital patients. *American Journal of Veterinary Research*. 35: 839-842.
- Howard M and Hayes J 1974. Congenital umbilical and inguinal hernias in cattle, horses, swine, dogs, and cats: risk by breed and sex among hospital patients. *American Journal of Veterinary Research*. 35 (6): 839-842.
- Keown G H 1976. The abdominal wall. *Large Animal Surgery*. Edited by Oehrme FW and Prier JE, the Williams and Wilkins, Baltimore/London. Pp. 146-179.
- Krishnamurthy D 2002. Hernia in Ruminant Surgery. 6th edition. Edited by Tyagi RPS and Singh J CBS publishers & distributors. New Delhi. Pp. 225-237.
- Leipold HW, Huston K and Dennis SM 1983. Bovine congenital defects. *Advanced Veterinary Science and Compendium Medicine*. 27: 197-271.
- McIlwraith CW 1984. Equine digestive system. *Large Animal Surgery by Jennings, PB Philadelphia WB Saunders CO*. Vol. 1. Pp. 620.
- O'Connor JJ 1980. Affections of the abdomen. In *Dollar's Veterinary Surgery*. 4th edition. CBS publishers and distributors, New Delhi. Pp. 661-683.
- Peacock EE, J R and Van Winkle W 1976. Wound repair. *Surgery Gynaecology and Obstetrics*. 140: 7-10.
- Priester WA, Glass AG and Waggoner NS 1970. Congenital defects in domesticated animals: General consideration. *American Journal of Veterinary Research*. 31: 1871-1879.
- Rahman MM, Biswas D and Hossian MA 2001. Occurrence of umbilical hernia and comparative efficacy of different suture materials and techniques for its correction in calves. *Pakistan Journal of Biological Science*. 4: 1026-1028.
- Read R 1985. Cranial abdominal hernias. *Text book of Small animal surgery*. By Slatter Douglas. Philadelphia W. B. Saunders Co. Vol. 1. Pp. 853.
- Roberts S J 1999. Gestation period-embryology, foetal membrane and placenta-teratology and parturition. *Veterinary Obstetrics and Genital Diseases*. 2nd edition. CBS publishers and distributors, India. Pp. 36-226.
- Samad MA, Islam MA and Hossain MA 2002. Patterns of occurrence of calf diseases in the district of Mymensingh in Bangladesh. *Bangladesh Veterinary Journal*. 36 (1-2): 01-05.

- Singh AP, Eshoue SM, Rifat JF and Falehae NG
1989. Hernia in animals. A review of 59 cases.
Indian Journal of Veterinary Surgery. 10:28-31
- Venugopalan A 2000. Suture materials In Essentials
of Veterinary Surgery. 8th edition. Oxford & IBH
publishing Co. Pvt. Ltd., New Delhi. Pp. 11-20.
- Zhigachev AI 1983. The role of genetic factors in
umbilical hernia in cattle. The inheritance and
frequency of umbilical hernia in cross breeding.
Genetica. 19: 312-315.

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