

*Article*

## **Prevalence of umbilical hernia of calves and its risk factors at Tangail Sadar of Bangladesh**

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**Abstract:** This study was done to investigate the prevalence of umbilical hernia of calves and its risk factors during the period from July, 2012 to January, 2013 at Tangail Sadar Upazila of Bangladesh. A total number of 1053 animals were examined during the study period where diagnosis based on the clinical history, clinical signs, palpation, needle puncture, auscultation. Then the animals was subdivided into some risk factors such as age, sex, breed, history of umbilical infection which may be lead to umbilical hernia. It was observed that male (61.10%) were in more risk than that of female (38.90%). In case of male calves maximum occurrence of the disease were in the age group of 1-3 months (45.45%) followed by <01 month of age group (36.36%) and least occur in 3-6 months of age group (18.18%) and in case of female calves maximum occur in the age of 1-3 months (71.43%) followed by in the age group of <01 month and 3-6 months (14.29%). The occurrence of umbilical hernia was more common in crossbreed calves (77.78%) than that of indigenous calves (22.22%). In case of crossbreed animals, male calves (44.44%) were more susceptible than in female calves (33.33%). In case of indigenous animals, male and female calves (11.11%) are more or less equally susceptible to the disease. In this study other umbilical infection likes umbilical abscess and navel ill which enhance the probability of occurrence of umbilical hernia, although it may be inherited in a dominant or recessive mode.

**Keywords:** umbilical hernia; calf; risk factors; crossbreed calves

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### **1. Introduction**

There is about 2.5 core atle population in Bangladesh (DLS, 2016). Livestock rearing is the integral part of farming system in our country, contributing 20% of the total inputs needed for crop production and 1.66% itself on GDP (Banglapedia, 2016). The management practices of animals and geoclimatic condition of Bangladesh favorable for the occurrence of various diseases. The accidental or physiological protrusions of an organ or part of an organ through an aperture in the surrounding structure are called hernia. Umbilical hernia is the protrusion of a portion of the abdominal contents through the area of the umbilical scar to lie beneath the skin which remain intact. It may be congenital or acquired during the first few weeks after birth. The hernial contents may be bowel (caecum or colon) or omentum or both. Among this umbilical hernia was found most common in calves up to 1-3 months of age (Ali *et al.*, 2013). Adhesion between the sac and contents is rare. The prevalence of hernia varies with various risk factors, such as age, sex, breed, season etc. Surgical affections in calves comprise both congenital and acquired disorder. Umbilical hernia is the most common surgical affection in

calve. Umbilical hernias are commonly identified in dairy heifers. In 18 commercial dairy herds in New York, 15% of heifer calves had umbilical hernias during the first 3 months of age (Radostits *et al.*, 2007).

It is one of the most important surgical affection of calves in Bangladesh and the economic effect of umbilical hernia is high as compare with others surgical diseases that of high economic effects. The disease causes less growth and even death of animals. Proper hygienic management, care and treatment may recover the animals (Ali and Sultana, 2013).

Study on umbilical hernia is available in Bangladesh. Same type of study about umbilical hernia was done by Rahman *et al.* (2001). This work was conducted in this area to determine the prevalence of umbilical hernia, and the effects of risk factors (age, sex, breed, season, history umbilical infection) on the occurrence of umbilical hernia in calves.

## **2. Materials and Methods**

### **2.1. Experimental animals**

The present investigation was conducted on 18 calves. These animals were apparently healthy. Out of 18 calves affected with umbilical hernia, 4 were indigenous and 14 were crossbreed. Among the experimental animals 11 were male and 7 were female. Ages ranged from 3 days to 6 months and body weights from 20 to 40 kg.

### **2.2. History**

The age, sex and breed of every calf presented the veterinary clinic affected with umbilical hernia were recorded. Occurrence of the disease with respect to season was also recorded.

### **2.3. Clinical examinations of calves**

#### **2.3.1. Diagnosis of hernia**

A preliminary diagnosis was made from the history and by palpation of the umbilical region. Diagnosis of the cases, however, was confirmed by exploratory puncture of the navel swelling and demonstration of intestinal contents. Detection of hernial ring with the index finger also aided diagnosis.

#### **2.3.2. Reducibility**

The affected animal was placed in dorsal recumbence and the contents were pushed back into the abdomen. In case of reducible hernia, the contents went back to the abdominal cavity and the abdomen. In case of reducible hernia, the contents went back to the abdominal cavity and the hernial ring became evident.

#### **2.3.3. Monitoring of clinical parameters**

Respiratory rate, heart rate and rectal temperature were recorded prior to surgery and thereafter daily until the 10<sup>th</sup> post-operative day. Chromic catgut (Surgigut<sup>®</sup>, Huaiyin Medical Instruments Co. Ltd., China) no.2 and Polypropylene (Prolene<sup>®</sup>, Johnson & Johnson Ltd., Aurangabad, India) no.1 Suture materials used in the present study.

### **2.4. Anesthesia**

Xylazine hydrochloride (Rompun<sup>®</sup>, Bayer Korea, Ltd.) was administered at a dose rate of 0.01 mg/kg body weight through intramuscular route to calm down the calf. Later, 7 ml of 2% lignocaine hydrochloride (Jasocaine<sup>®</sup>, Jason Pharmaceuticals Ltd., Dhaka, Bangladesh) was infiltrated in an inverted "V" shaped manner from cranial to caudal aspect of hernial ring (Klein and Firth, 1988).

### **2.5. Operative procedure**

At first povidone iodine was properly soaked in hand to avoid contamination during surgery. Two elliptical incisions were made on either side of the ring. In case of a male calf, the incisions were 2-3 cm apart to prevent possible contamination of wound with urine (Figure 1). Following blunt dissection of the abdominal muscles, diameter of the hernial ring was measured. Then loose connective tissue and fascia were removed to create a room for incision on hernial sacs (Figure 2). Hernial sac was grasped and the content was pushed back to abdominal cavity. Some portion of the sac was removed and the edges of the ring were scratched and taken into apposition using the mattress technique. Either catgut or polypropylene was used to close hernial ring. After that the skin edges were closed by horizontal mattress suture with nylon thread.

### 2.6. Postoperative management

This consisted of a course of antibiotic for 7 days. The skin stitches were removed after 10-12 days of operation. The animals were kept under supervision for a month to observe any complication if there was any (Figure 3).



Figure 1. Opening of hernial ring.



Figure 2. Removal of umbilical sac.



Figure 3. Post operative care.

### 3. Results and Discussion

The prevalence of umbilical hernia is 1.7% (Table 1). Another reporter (Gadre *et al.*, 1989) reveals the prevalence of umbilical hernia is 1.8% which support my findings.

Table 1. Prevalence of umbilical hernia

Total number of animal	Umbilical hernia	Others	Total
1053	18(1.7%)	98.30 %	100%

Table 2. Effects of age and sex on the occurrence of umbilical hernia in calves.

Age	No. of occurrence of umbilical hernia		
	Male (%)	Female (%)	Total (%)
< 1month ( n=5)	4 (36.36)	1 (14.29)	5 (50.65)
1-3 months (n=10)	5 (45.45)	5 (71.43)	10 (116.88)
3-6 months (n=3)	2 (18.18)	1 (14.29)	3 (32.47)
<b>Total (n=18)</b>	<b>11 (61.10)</b>	<b>7 (38.90)</b>	<b>100.00</b>

The occurrence of Umbilical hernia has also effect on age and sex. In male animals, the highest occurrence of the disease occurred in calves of 1-3 months (45.45%) and the lowest proportion was observed in calves of 3-6 months (18.18%) whereas the highest percentage of the disease in the female was also recorded in 1-3 months age group (71.43%) but the lowest part was observed in calves under 1 month of age (14.29%) (Table.2). This report is partially related with the reports of some researchers (Gadre *et al.*, 1989; Rahman *et al.*, 2001). The disease is more prevalent in calves of below 1 month. Calves between 1 and 3 months were most frequently affected with umbilical hernia. This finding about age and sex is the agreeable with those of the reports (Rahman *et al.*, 2001; Khokon *et al.*, 2017) but contradictory to some researchers (Brem *et al.*, 1985; Singh *et al.*, 1989) who indicated females to be more susceptible to umbilical hernia than males.

**Table 3. Effects of breed on the occurrence of umbilical hernia in calves.**

Breed	No. of occurrence of umbilical hernia		
	Male (%)	Female (%)	Total (%)
Indigenous (N=4)	2 (11.11)	2 (11.11)	4 (22.22)
Cross (N=14)	8 (44.44)	6 (33.33)	14 (77.78)

The effect of breed on the occurrence of umbilical hernia in calves is shown in Table 3. In indigenous and cross breed animals the proportion of umbilical hernia is 22.22% and 77.78% respectively whereas among the indigenous calves 11.11% were in male and 11.11% in female but in the cross-breeds were 44.44% in male and 33.33% in female respectively. This report is supported by several researchers (Angus and Young, 1972; Hayes, 1974; Baird, 1993). In cross-breed animals the hernia has been reported to be hereditary in origin and occur due to one or more pair of autosomal recessive genes. In the present study, occurrence of umbilical hernia was significantly high in the crossbreed calves than that in the indigenous breed. The higher incidence in cross breed calves may due to preference of owners to inseminate their cows with these breeds.

**Table 4. Occurrence of umbilical hernia in association with umbilical infection.**

Name of affection	No. of cases	Age (days)	Sex		Breed		Overall (%)
			Male	Female	Local	Cross	
Umbilical abscess	3	10 to 50	2	1	1	2	16.66
Naval ill	2	8 to 60	2	-	1	1	11.11
<b>Total</b>	<b>5</b>		<b>4</b>	<b>1</b>			<b>27.77</b>

The above table exerts 16.66% umbilical abscess causes umbilical hernia and 11.11% naval ill causes umbilical hernia whereas 27.77% constitutes the umbilical hernia. This finding is supported by Radostits *et al.* (2007) who reported heifers with umbilical infection were 5-65 times likely to develop a hernia as were heifers without umbilical infection.

#### 4. Conclusions

The occurrence of umbilical hernia is most common surgical case in calves in Bangladesh and economic effects is high as compare with that of other diseases of high economic effects in calves. The diseases occurred mostly in calves of 1-6 of month's age group. It is more common in male calves than that in female calves. The higher prevalence of umbilical hernia was observed in the cross breed calves in contrast to indigenous calves. The bull suffered from umbilical hernia should not be used for breeding purpose, as these might transmit the autosomal recessive gene responsible for congenital defects. Further efforts are needed to identify the risk factors and to suggest correction procedure. Therefore, farmers should be aware to prevent this disease through surgical intervention with the help of veterinary clinicians.

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#### Conflict of interest

None to declare.

#### References

- Ali MZ and S Sultana, 2013. Isolation and identification of bacteria from tracheas and lungs of buffaloes in Dinajpur. *S. J. Microbiol.*, 2: 31-33.
- Ali MZ, S Sultana, MT Rahman and MS Islam, 2013. Economics of fertility management of small holding dairy farms in Bangladesh. *Iran. J. Applied Anim. Sci.*, 3: 509-512.
- Angus K and GB Young, 1972. A note on the genetics of umbilical hernia. *Vet. Rec.*, 90: 245-126.
- Baird AN, 1993. Omphalocele in two calves. *J. Am. Vet. Med. Assoc.*, 202: 1480-1482.
- Brem GJ, OD Hondele and H Kraeusslich, 1985. Investigations on the occurrence and causes of umbilical hernia in Brown swiss cattle. *Tieraerztliche Umschau (Germany, FR)*. 40: 877-882.

- Gadre KM, RK Shingatger and VS Panchabhai, 1989. Biometry of umbilical hernia in cross-bred calf. *Indian Vet. J.*, 66:10-11.
- Hayes JrHM, 1974. Congenital umbilical and inguinal hernias in cattle, horses, swine, dogs, and cats: risk by breed and sex among hospital patients. *Am. J. Vet. Res.* 35:839-42.
- Khokon MSI, Azizunnesa, MM Islam, KB Chowdhury, ML Rahman and MZ Ali. 2017. Effect of mastitis on post-partum conception of cross bred dairy cows in Chittagong district of Bangladesh. *J. Adv. Vet. Anim. Res.*, 4: 155-160.
- Klein WR and EC Firth, 1988. Infection rates in contaminated surgical procedures: comparison of prophylactic treatment for one day or for four days. *Veterinary Record*, 123: 564-566.
- Radostits OM, CC Gay, KW Hinchcliff and PD Constable, 2007. *Veterinary Medicine. A textbook of the diseases of cattle, horses, sheep, pigs and goats*, 10<sup>th</sup> Ed. pp.127-172.
- Rahman MM, D Biswas and MA Hossian, 2001. Occurrence of umbilical hernia and comparative efficacy of different suture materials and techniques for its correction in calves. *Pakistan J. Biol. Sci.*, 4: 1026-1028.
- Singh P, DK Sarma, S Sukhbir, SM Bell and S Channa, 1989. Polymelia with atresia ani in a cow calf. *Indian J. Vet. Surg.*, 10: 62-64.