

**SURGICAL AFFECTIONS AND OPERATIVE  
OUTCOME OF RUMINANTS AT UPAZILA  
VETERINARY HOSPITAL (UVH) PATIYA,  
CHATTOGRAM**



**A clinical report submitted in partial satisfaction of the requirement  
for the Degree of Doctor of Veterinary Medicine (DVM)**

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## Abstract

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Ruminants commonly suffer from a variety of surgical diseases that can result in financial losses in different parts of the world, while the majority of these affections are treatable. Based on surgical cases seen at the Upazila Veterinary Hospital in Patiya, Chattogram, from April 16, 2023, to June 1, 2023, an investigation was conducted to ascertain the incidence and outcome of surgical cases in the Patiya Upazila. In this case study, the incidence of different surgical affection among the eighty four ruminants under the Patiya upazila in Chattogram was 5.95 percent. In this study, all of the surgical cases had a 100 percent successful outcome. Without a doubt, following aseptic practises throughout surgery is crucial to reducing the risk of infection and ensuring a positive surgical result, particularly in situations when infrastructure and resources may be limited. Although conducting surgery in the field can be difficult, following the aseptic protocols significantly increases the chance of a successful surgical outcome.

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**Keywords:** Incidence, Patiya, Ruminants, Surgical affection

## Chapter 1: Introduction

Bangladesh is blessed with an abundance of animal resources, including 24.238 million cattle, 1.486 million buffalo, 26.267 million goats, and 3.537 million sheep (DLS, 2019). Cattle and goats frequently experience a wide range of surgical affections, including gid disease, hernia, esophageal obstruction, amputation, wounds, urolithiasis, medial patellar desmotomy, lymphadenitis, subcutaneous cysts, fractures, myiasis, bloat and more. All of which can be treated with surgery if it is done at the right time. (Alam et al. 2005; Hossain et al. 2014; Miah et al. 2017)

In Bangladesh, from 2009 to 2019, Trishal, Muktagacha, and Fulbaria of Mymensingh, all three Upazila, recorded a total of 3744 goats. The surgical affections were determined to be 34.18% in Fulbaria, 32.69% in Muktagacha and 33.11% in Trishal. In Fulbaria, the incidence of various surgical affections in goats was as follows: wounds (30.54%), gid diseases (23.28%), urolithiasis (16.09%), bloat (9.06%), fracture (8.99%), lymphadenitis (6.48%), tumor (4.06%), and gangrenous mastitis (0.94%). In Muktagacha, the incidence was as follows: wounds 30.83%, gid diseases 23.08%, and urolithiasis 19.98%. (Islam et al. 2020)

The surgical conditions were visible in ruminants at the several veterinary hospitals in Chittagong region. According to Arju et al. (2014), surgical problems are more common in Rangunia (7.55%). Most of the surgical problems are myiasis (18.69%), naval disease (13.79%), wound (12.38%), foot illness (6.35%), upward patellar fixation (1.89%) and fracture (4.43%) are the disorders with the highest prevalence in hill tracts.

Incidence of surgical affection in ruminants is common. It is common to see umbilical hernias in goats, calves and foals (Dennis et al. 1968; St. Jean et al. 2004). They can be congenital or acquired. Many tiny umbilical hernias might seem to heal on their own, but large or strangulated hernias will need to be surgically repaired.

Esophageal obstruction is uncommon in small ruminants. The lumen of the cervical section of the esophagus appears to be rosette-shaped and is thicker than the rest of the wall (Singh et al. 1993). Its caudal region is initially tiny before becoming wider. Vegetables, phytobezoars, leather, wool, polythene and rubber sheets; all have been

known to cause obstruction (Ojha and Mohanty 1970; Umakanthan et al. 1950; Dilipkumar et al. 1980).

Small ruminants were examined in veterinary practice frequently have musculo-skeletal damage to their limbs (Kaneps et al. 1996; Desrochers et al. 2014). The best-case scenario after a serious musculo-skeletal injury is to preserve the entire limb. However, this may not be possible due to a poor outlook for a return to normal function or financial constraints. In these situations, partial or whole-limb amputating is regarded as a beneficial substitute for euthanasia.

The stifle joint, which contains the femuro-patellar and femuro-tibial joints, is crucial from a clinical perspective (Abdalla et al. 2013). Patellar ligaments attach the patella to the cranial tibial tuberosity. The medial, middle, and lateral patellar ligaments are described by Getty et al. (1975). For the medial patellar desmotomy during upward patellar fixation, the medial patellar ligaments in the stifle joint are surgically significant (Uddin et al. 2009).

Large and small animals, including birds, can be treated with great modern surgical facilities in developed nations, but fewer opportunities exist in developing nations due to restricted access to operating rooms, a lack of specialized surgical instruments, and a lack of anesthetic devices needed for both induction and maintenance of anesthesia. Despite difficulties, veterinary surgeons frequently do minor surgical procedures on sheep, calves and goats in the field in our nation. Additionally, there aren't many urban areas in our country where surgery is performed on pets, like animals and birds. Both congenital and acquired surgical affections fall into this category. Contrary to goats, where most cases are acquired, calves typically have congenital surgical conditions. There have been a few studies conducted in Bangladesh on surgical affections in calves and goats (Samad et al. 2000).

However, there is a lack of geographic organization in the database information on the occurrence of various surgical illnesses in animals. A survey is needed to provide a baseline for an upcoming study on surgical issues in animals. Additionally, as part of internship placement at Patiya Upazila, a number of surgical disorders are handled in this area. The Upazila Veterinary Hospital (UVH) in Patiya, Chattogram, is one of the

most important and reliable sources of knowledge on the many surgical conditions in sheep, goats and cattle in the research area.

Taking into consideration these significant surgical needs, the following objectives were established when designing the present study:

1. To determine the incidence of surgical affections in ruminants at the veterinary hospital in Patiya upazila, Chattogram
2. To determine surgical outcome in ruminants



## **Chapter 2: Materials and Method**

### **2.1 Study area and study period**

This study was carried out at Upazila Veterinary Hospital, Patiya, Chattogram, during the period from April 16, 2023 to June 1, 2023.

### **2.2 Study design**

Upazila Veterinary Hospital received a variety of animals, including cattle, dogs, cats, sheep, goats, chickens, and birds, both contagious and non-infectious. The majority of the cases were ruminants. Therefore, the only ones included in this study were ruminants, such as cattle, goats, and sheep. Following arrival at the hospital, all necessary data was collected, including clinical parameters and history. Surgical affections were identified and treated based on the results of the clinical examination and history.

### **2.3 Clinical history, examination and diagnosis**

In umbilical hernia, the animal presents with the umbilicus protruding or bulging. While tenderness and imprisonment are common physical findings. The bulge can often be pressed back through the hole in the abdominal wall. The health status of the animal was assessed physically and diagnosed with umbilical hernia. Before surgery, the animal was fasted for 6 to 12 hours.

In esophageal obstruction, the patient's history included not eating, restlessness, salivation, a palpable swelling bulging in the esophagus. Although the temperature and pulse rate were within normal limits, the respiration rate was elevated. Surgery was chosen in this case because esophageal blockage was suspected based on the patient's history and clinical observations.

In forelimb amputation: In this case the animal had gangrene in forelimb, based on this history and observations, surgery was chosen to treat it.

In tassels excision surgery, this case was suspected of having an aesthetic issue based on the history and clinical observations, and surgery was chosen to treat it.

In medial patellar desmotomy, this case was suspected of having problems walking based on the history and clinical signs of a lameness in the hind legs and diagnosed as momentary upward fixation of the patella, and surgery was chosen to treat it.

#### **2.4 Instruments used for surgery**

Shaving blade, catgut, nylon threads, silk threads, artery forceps (straight and curve), rat tooth forceps, allis's peritoneum holding forceps, mayo scissors (straight and curvy), cotton, gauze, povidone iodine and alcohol. Prior to use, all tools were sterilized using the hot water procedure (100°C for 30 minutes).

#### **2.5 Patient preparation**

Preparation was conducted in the open field. By using shaving blade, hair was removed from the surgery site. Cotton was used to dry the skin after shaving. Povidone iodine (Povisep) solution was used to make skin surface to be aseptic.

#### **2.6 Fluid therapy**

Before the procedure, isotonic fluids were given intravenously to rehydrate the dehydrated animals.

#### **2.7 Animal control and anesthesia**

For cattle, diazepam (Sedil, Square Pharmaceuticals Ltd.) was administered at a dose rate of 0.6 mg/kg body weight through an intravenous route to calm down the patient. Later, 7 ml of 2% lignocaine hydrochloride (Jasocaine, Jayson Pharmaceuticals Ltd., and Dhaka, Bangladesh) was infiltrated as ring block method.

For goats and sheep, diazepam (Sedil, Square Pharmaceuticals Ltd.) was administered at a dose rate of 0.8 mg/kg body weight through an intravenous route to calm down, and 2% lignocaine hydrochloride (Jasocaine, Jayson Pharmaceuticals Ltd., Dhaka, Bangladesh) had been used locally.

## 2.8 Surgical correction

**Umbilical hernia:** On either side of the ring, two elliptical cuts were made. The diameter of the hernial ring was assessed after blunt dissection of the abdominal muscles. Then, to make room for the hernial sac incision, loose connective tissue and fascia were cut away. The hernial sac is severed at the neck, the stump is inserted into the hernial ring, and finally the hernial sac is ligatured. The margins of the hernial ring are then cleaned, joined with a simple interrupted nylon suture, given a simple continuous suture by catgut in muscle, given a subcutaneous suture by catgut, given a horizontal mattress suture by silk in skin, and sealed. Given povidone-iodine ointment to the skin suture region and provided a bandage (Figure 1).

**Esophageal obstruction:** A longitudinal incision was made above the swelling along the upper edge of the jugular furrow after taking every aseptic precaution. The esophagus was distinguished by its distinctive pink color, which was located between the sternocephalicus muscle and trachea. Umbilical tape was used to apply a temporary ligation distal to the obstruction and expose the esophagus in order to prevent regurgitation. On the swelling, an incision was made. Mango seed was taken out through the incision, and the esophagus was irrigated with ordinary saline. The sub mucosa and muscularis were opposed with a simple continuous pattern using catgut, and the mucous membrane was sutured using a simple interrupted pattern. The temporary ligature was taken off, and any leaks were examined. With simple, interrupted sutures, the skin was attached (Figure 2).

**Forelimb amputation:** An incision was made circumferentially into the skin, just ventral to the intended site of amputation. Muscles and arteries were ligated and transected as necessary after the underlying subcutaneous tissue was sharply sliced. Collateral ligaments and other soft tissue structures were cut when disarticulation was necessary, and the distal section of the limb was excised. In every case, the muscle stumps were apposed over the bone end piece and stitched together with absorbable suture material in a straightforward interrupted suture pattern to hide the amputation site. Simple interrupted suture patterns were used to seal the skin with non-absorbable suture material (Figure 3).

**Surgery for excision of tassels:** An incision was made in both side at the base of the tassels. Muscles and arteries were ligated and transected as necessary. The temporary ligature was taken off, and any leaks were examined. With simple, interrupted sutures, the skin was attached (Figure 4).

**Medial patellar desmotomy:** Cattle was restrained using cotton rope while lying on the injured leg. Carefully bound the forelegs. Topography was detected. The middle finger was used to locate the tibial tuberosity. The slippery medial ligament was located by the forefinger next to the tuberal tuberosity at approximately a 45-degree medial angle. There was a raised ligament. The ligament was sliced using a sterilized surgical blade attached to the BP handle. One hand touched the medial patellar ligament with care, while another hand carefully cut the ligament from the central edge to the medial side. The ligament was cut while making a crunching noise (Figure 5).

## **2.9 Post-operative management**

This consisted of a course of antibiotics for 7 days. The skin stitches were removed within 10 days after the operation. The animals were kept under supervision for a month to observe any complications, if there were any.

1. Ceftriaxone Sodium. For Cattle: 10 mg/kg body weight intra-muscularly once daily for 5 days. For Goat/Sheep : 20 mg/kg body weight intra-muscularly twice daily for 5 days (Inj. Trizon, Acme Laboratories Ltd., Dhaka, Bangladesh)-
2. Pheneramine Maleate. For Cattle: 1 mg/kg body weight intra-muscularly once daily for 3 days. For Goat/Sheep : 2 mg/kg body weight intra-muscularly once daily for 3 days (Inj. Astavet, Acme Laboratory Ltd., Dhaka, Bangladesh)
3. Flunixin Meglumine. For Cattle: 1.5 mg/kg body weight intra-venously twice daily for 5 days. For Goat/Sheep : 2 mg/kg body weight intra-venously once daily for 5 days (Inj. Fixin Vet, ACI Ltd., Dhaka, Bangladesh)

In case of profuse bleeding, 5% dextrose saline about 20 ml/kg body weight/ hour was used for the patients.

Tincture iodine and isotonic fluid were used to clean the wound and povidone iodine ointment was applied to dress it. Dressgel FR Vet - 20gm was also used in post-operative treatment as an antiseptic and fly repellent agent. The animal was kept in a clean house for a few days, especially until healing the wound.

## **2.10 Data management and analysis**

After data collection, data were entered into a Microsoft Excel spreadsheet, percentages of various surgical affections were calculated, and the incidence of surgical attachments was calculated as the specific cases of surgical affections. A structured data handling format was created, and every important detail related to the investigation's goal was adequately gathered and recorded.

## Chapter 3: Results

The clinical study was conducted with one cow, three goats and one sheep affected by various types of surgical affections. The results of the study are presented in Tables number 1, 2 and 3.

### 3.1 Incidence according to species

The overall surgical affection in this case study was 5.95% among eighty four ruminants. The incidence of different types of surgical affections was 5.88% in cattle and 5.66% in goats and 7.14% in sheep, under Patiya upazila, Chattogram (Table 1).

**Table 1.** The overall incidence of various surgical affections in ruminants from april 16, 2023, to june 1, 2023

Species	No of animals examined	No. of affected animals	Incidence %
Cattle	17	1	5.88
Goat	53	3	5.66
Sheep	14	1	7.14
<b>Total</b>	<b>84</b>	<b>5</b>	<b>5.95</b>

### 3.2 Incidence of surgical affections according to age, sex

**Table 2.** Incidence of surgical affections in ruminants according to age, sex from april 16, 2023, to june 1, 2023

Species	Name of surgical affection	Affected cases (n)	Age (month)	Sex	Body Weight(kg)	Incidence %
<b>Cattle</b>	Medial patellar desmotomy	1	13	M	136.8	20
	Umbilical hernia	1	9	M	13.8	20
<b>Goat</b>	Esophageal obstruction	1	5	F	6	20
	Excision of tassels	1	13	M	15.6	20
<b>Sheep</b>	Limb amputation	1	4	M	8.1	20
<b>Total</b>		<b>5</b>				<b>100</b>

### 3.3 Outcome of surgical management

The overall treatment outcome of different types of surgical affections was good and curability was 100% in ruminants under Patiya Upazila, Chattogram (Table 3).

**Table 3.** The overall treatment outcome of various surgical affections in ruminants from april 16, 2023, to june 1, 2023

<b>Species</b>	<b>No. of surgically affectionate animals</b>	<b>No. of treatment animals</b>	<b>Curability %</b>
<b>Cattle</b>	1	1	100
<b>Goat</b>	3	3	100
<b>Sheep</b>	1	1	100
<b>Total</b>	<b>5</b>	<b>5</b>	<b>100</b>



**Figure 1. Reducible umbilical hernia in goat**



**Fig.1.1 Surgical site in goat**



**Fig.1.2 Administration of sedative**



**Fig.1.3 Opening of hernia**



**Fig.1.4 Closing the hernial ring**



**Fig.1.5 Suturing the muscle**



**Fig.1.6 Completion of suturing**



**Fig.1.7 Post-operative medication**

**Figure 2. Esophageal obstruction in goat**



**Fig.2.1. Before surgery**



**Fig.2.2. Administration of sedative**



**Fig.2.3. Suturing the muscle**



**Fig.2.4. Suturing the skin**





**Fig.2.5. After surgery with mango seed**



**Fig.2.6. Surgical site after surgery**



**Fig.2.7. Observation after surgery**



**Fig.2.8. Suture removing**

**Figure 3. Fore limb amputation in sheep**



**Fig.3.1. Before surgery**



**Fig.3.2. Administration of sedative**



**Fig.3.3. Administration of local anesthetics**



**Fig.3.4. Excise the limb**



**Fig.3.5. Suturing the muscle**



**Fig.3.6. Suturing the skin**



**Fig.3.7. Surgical site after surgery**



**Fig.3.8. After surgery**



**Figure 4. Excision of tassels surgery in goat**



**Fig.4.1. Animal before surgery**



**Fig.4.2. Surgical site shaving**



**Fig.4.3. Surgical site preparation**



**Fig.4.4. Administration of Local anesthetics**



**Fig.4.5. Incision and bleeding control**



**Fig.4.6. Suturing the skin**





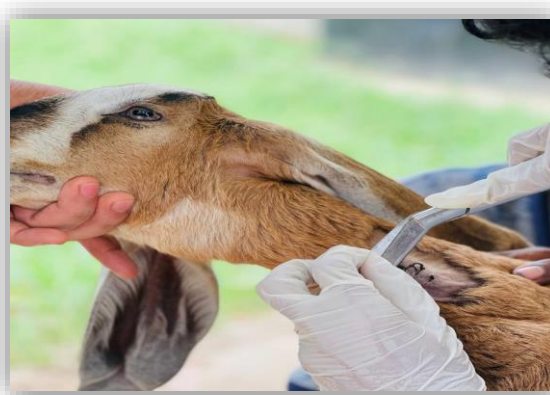
**Fig.4.7. Animal after surgery**



**Fig.4.8. Surgical site after surgery**



**Fig.4.9. Suture removing**



**Fig.4.10. Suture removing without any complication**

### Figure 5. Medial patellar desmotomy in cattle



**Fig.5.1. Restraining and palpation of medial ligament**



**Fig.5.2. After detection cutting the medial patellar ligament**

## Chapter 4: Discussion

Surgery related conditions, viral disorders, gynecological issues, and other factors all affect the health of animals. The primary issues facing farmers include surgical affections (Noman et al. 2013). It was needed to identify typical surgical issues that compromise the efficiency and fitness of ruminants and diminish the profitability of small-scale farmers is serious. Therefore, the purpose of the study was to determine how common surgical issues are in Patiya.

The outcome of many surgical procedures in this studies were positive and curability were 100%. There were no complications with medial patellar desmotomy, forelimb amputation, excision of tassels and esophageal obstruction. However, there was a minor maggot infestation in the case of the umbilical hernia due to owner improper management which was again treated within a few days and the infestation successfully cured under supervision.

In this case study, one goat with umbilical hernia, later affected with myiasis which was treated and cured properly. Al-Sobayil et al. (2007) stated that an umbilical hernia ring can range in size from two to seven fingers' breadth. For the sheep and goats, surgical repair was effective in nine out of ten cases. Among of these cases, a case of umbilical hernia with an umbilical abscess had broken down with sepsis formation at the surgical site. The umbilical hernia reoccurred in this case.

In this case study a mango seed was diagnosed according to patient feeding history, palpation and removed surgically through esophagotomy. According to Sankar et al. (2010), esophageal obstruction in a goat was rare because goats are selective feeders and phytobezoars and lump of polythene paper was recovered through esophagotomy. According to Fleming et. al (1989), thoracic radiography was useful in localization of esophageal obstruction and this condition was successfully treated by removal of the granulation tissue through left-sided thoracotomy.

In this case study the patient who was affected with foot infection and go through with right forelimb amputation was cured successfully. According to Gamsjaeger et al. (2018), in case of limb amputation, physiotherapy is a crucial component of

rehabilitation in goats and sheep. The possibility of postoperative problems, such as disorganized gait, tendon breakdown and laxity of the contralateral limb, persistent lameness, surgical site infection, and angular limb deformity in goats and sheep undergoing limb amputation, should be known to veterinarians and owners.

Tassel cysts occur when the branchial clefts fail to merge during embryonic growth. In goats, visible cysts may prompt a request for surgical removal. Aspiration is ineffective as the cyst is likely to refill and there is a potential for abscess formation. However, in this particular case study, the goat underwent surgery for cosmetic reasons with no complications observed before or after the procedure. According to Sadan et al. (2019), tassels cysts commonly recorded in sheep and goat. According to Abu-Seida et al. (2014), tassel cysts are an inherited fault resulting in swelling at the base of one or both tassels, varying from pea-size to several centimeters in diameter.

In this case study, the patient which had both hind limb upward patellar fixation and diagnosed by the topographic location of medial patellar ligament using forefinger and then operation was successful through upward patellar desmotomy and there was no complication after this surgery. According to Sherif et al. (2017), twenty one live cattle treated for medial patellar desmotomy and it is less invasive as skin at the surgical site is not incised, pericapsular fat and joint capsules not invaded and the ligament is fully transected in a one-step procedure where no post-operative problems were noted for more than two months of the following treatments in this procedure.



## **Conclusions**

Ruminants commonly suffer from a variety of surgical affections that can result in financial losses. However, the majority of these affections are treatable. In this study incidence of various surgical affection in ruminants was 5.95%. All of these surgical incidence had successful outcomes. This study included a variety of incidences, including tassel excision, oesophageal obstruction, umbilical hernia, upward patellar desmotomy and amputation in field condition at Patiya upazila where one case observed with complication and affected with myiasis. Another four cases which had no complication and surgical outcome was 100%. Therefore, the study concluded that in surgical outcome success rate was very high. From this study, the classification of these affections provides veterinarians and researchers with expertise in ruminants care with a wide range of options for managing and controlling these surgical affections, as well as conducting scientific studies on their incidence and geographic distributions in relation to risk factors that predispose to affections.

## References

- Abdalla, H., Abdalla, K., Yosrria, A., Rahman, A., Khaled, A., & Ruwaida, A. (2013). Why the incidence of the upward fixation of the patella is higher in buffalos than in cattle. *European Journal of Veterinary Medicine*, 2, 109-142.
- Abed, R., & Acosta, A. (2018). Assessing livestock total factor productivity: A Malmquist Index approach. *African Journal of Agricultural and Resource Economics*, 13(311-2019-676), 297-306.
- Abu-Seida, A. M. (2014). Radiographical examination and treatment of wattle cyst in goats and sheep. *Global Veterinaria*, 12, 862-864.
- Alam, M. M., Hossain, M. A., & Mohammed, Y. (2005). Effects of plasma with minerals and vitamin on various haemato biochemical parameters of calves. *Bangladesh Veterinary Journal*, 38, 15-24.
- Al-Sobayil, F. A., & Ahmed, A. F. (2007). Surgical treatment for different forms of hernias in sheep and goats. *Journal of Veterinary Science*, 8(2), 185-191.
- Arju, M. T., Samaddar, K., Rahman, M. M., Haq, M. M., Rana, M. S., Juyena, N. S., & Hasan, M. R. (2014). Surgical affections: A comparative scenario of Chittagong region. *International Journal of Natural and Social Sciences*, 1(2), 31-36.
- Dennis, S. M., & Leipold, H. W. (1968). Congenital hernias in sheep. *Journal of the American Veterinary Medical Association*, 152(7), 999-1003.
- Dilipkumar, D., KASARLIKAR, V., & Muralikrishna, B. V. (1995). Esophageal obstruction by a stone in a bullock. *Indian Veterinary Journal*, 72(4), 385-386.
- Desrochers, A., St-Jean, G., & Anderson, D. E. (2014). Limb amputation and prosthesis. *Veterinary Clinics: Food Animal Practice*, 30(1), 143-155.
- Fleming, S. A., Dallman, M. J., & Sedlacek, D. L. (1989). Esophageal obstruction as a sequela to ruptured esophagus in a goat. *Journal of the American Veterinary Medical Association*, 195(11), 1598-1600.

- Gamsjaeger, L., & Chigerwe, M. (2018). Indications for and outcomes of limb amputation in goats and sheep. *Journal of the American Veterinary Medical Association*, 252(7), 860-863.
- Hasan, M. J., Ahmed, J. U., & Alam, M. M. (2014). Reproductive performances of Black Bengal goat under semi-intensive and extensive conditions at rural areas in Bangladesh. *Journal of Advanced Veterinary and Animal Research*, 1(4), 196-200.
- Islam, M. D., Runa, R. A., & Alam, M. M. (2020). Prevalence and risk factors analysis of bovine foot diseases in certain milk pocket areas of Sirajganj District, Bangladesh. *Veterinary Sciences Research and Review*, 6(2), 73-79.
- Islam, M. A., AKTER, M. A., & ALAM, M. M. (2020). Prevalence and temporal distribution of surgical diseases in goats (*Capra hircus*) in Mymensingh district of Bangladesh. *Journal of Advances in Vet Bio Science and Techniques*, 5(2), 72-80.
- Kaneps, A. J. (1996). Orthopedic conditions of small ruminants: llama, sheep, goat, and deer. *Veterinary Clinics of North America: Food Animal Practice*, 12(1), 211-231.
- Miah, M. A. H., Hasan, M., Sarker, Y. A., Alam, M. M., & Juyena, N. S. (2017). Clinical evaluation of ethanolic extract of curcumin (*Curcuma longa*) on wound healing in Black Bengal goats. *Journal of Advanced Veterinary & Animal Research*, 4(3).
- Mondal, S., Karnam, S. S., Baranwal, A. K., & Das, P. (2013). Medial patellar desmotomy by blind method in large ruminants during upward Patellar fixation. *Exploratory Animal and Medical Research*, 3, 183-185.
- Noman, A. S. M., Juyena, N. S., Alam, M. M., Ferdousy, R. N., Paul, S., & Haq, M. M. (2013). Prevalence of surgical affections of cattle in Aarong Dairy Area of Pabna. *Progressive Agriculture*, 24(1-2), 85-92.
- Pugh, D. G. (2002). Pathology of the umbilicus. *Sheep and goat Medicine*, 104-105.

- Sadan, M. (2019). Superficial swellings in sheep (*Ovis aries*) and goats (*Capra hircus*): Clinical and ultrasonographic findings. *Journal of Veterinary Medical Science*, 81(9), 1326-1333.
- Samad, M. A. (2000). Veterinary practioners guide. LEP Publication 07 pp: 231-268
- Debnath, et al., 2003. *Pakistan Journal of Biological Science*, 6(10), 945.
- Sherif, M. W. E. S. (2017). New technique for medial patellar desmotomy in cattle and donkeys. *Open Journal of Veterinary Medicine*, 7(10), 144-150.
- St Jean, G. (1995). Male reproductive surgery. *The Veterinary Clinics of North America. Food animal practice*, 11(1), 55-93.
- St Jean, G., & Anderson, D. E. (2004). Surgery of the swine digestive and reproductive systems. *Farm Animal Surgery*, 559-565.
- Sankar, P., Kumar, R. V., Lakshmi, N. D., & Veena, P. (2010). Surgical management of cervical esophageal obstruction in a goat (*Capra hircus*)-A Case Report. *Indian Journal of Animal Research*, 44(2), 153-154.
- Sutradhar, B. C., Hossain, M. F., Das, B. C., Kim, G., & Hossain, M. A. (2009). Comparison between open and closed methods of herniorrhaphy in calves affected with umbilical hernia. *Journal of veterinary science*, 10(4), 343-347.
- Turner, A. S., & McIlwraith, C. W. (1989). Umbilical herniorrhaphy in the foal. *Techniques in Large Animal Surgery, 2nd ed. Lippincott Williams and Wilkins, Philadelphia, Pennsylvania*, 254-259.
- Uddin, M. M., Reza, M. S., Islam, K. N., Miazi, O. F., & Ahmed, S. S. U. (2009). Surgical Anatomical Measurements of Patellar Ligaments for Blind Method of Medial Patellar Desmotomy of Cattle during Upward Patellar Fixation in Bangladesh. *International Journal of Morphology*, 27(2).

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## **Biography**

I am Borhan Uddin Rabby, son of Kamal Uddin and Sherin Akter. I completed my secondary school certificate from Government Chattogram Collegiate School in 2015 and my higher secondary school certificate from Government Hazi Muhammad Mohsin College in 2017. I am an intern veterinarian at Chattogram Veterinary and Animal Sciences University, Bangladesh, under the Faculty of Veterinary Medicine. I have a keen interest in veterinary medicine and field research and wish to contribute to the development of my country by making use of my skills and imagination. That way, we can overcome the difficulties this field is currently facing.