A case report on correction of upward patellar fixation of cattle by medial patellar desmotomy at Anowara thana, Chattogram.

ABSTRACT

Upward fixation of the patella is one of the most common stifle joint functional abnormalities in cattle defined by the temporary or permanent dislocation of the patella from its normal position during locomotion. Although this disorder is not life threatening, it cause temporary impairment and discomfort, lowering the value of animals. A study was undertaken at Upazilla Veterinary Hospital in Anowara, Chattogram, from February to April 2021. This study looked at the effectiveness of the medial patellar ligament section technique as a surgical treatment for dorsal patellar fixation in cattle held in lateral recumbence. In this study period, there were found 5 animals suffering from upward patellar fixation. The ages of the animals ranged from 3 to 6 years. Females (80%) had a higher tendency than males (20%). Local breed (60%) cattle were more prone to cross breed (40%) cattle. All of the procedures were carried out using the blind method of medial patellar desmotomy. All of the animals recovered from surgery, demonstrating that the procedure used to treat dorsal patellar fixation in cattle was both effective and straightforward to implement.

Key words: Desmotomy, ligament, upward patellar fixation **.**

INTRODUCTION

In Bangladesh, cattle with upward fixation of the patella (UFP) are a prevalent surgical concern. UFP has been reported to occur intermittently in practically every domestic animal species (Cahill *et al.*, 1985; Shettko and Trostle, 2000; Araujo *et al*., 2008). It is marked by a transient or permanent dislocation of the patella from its normal position, making difficult mobility (Krishnamurthy and Tyagi, 1978; Amreshkumar, 2003). Animals who have a difficulty with one or both legs become a burden to the farmer. This issue might be temporary and recover on its own, or it can be persistent and require surgery to fix. This disorder has a significant economic impact because it lowers the market value of the affected animal (Marudwar *et al*., 1980).

The condition is distinguished by the entire extension of the hind limb backwards. The animals were unable to flex the leg at the joint in this condition, causing the toe to drag. The animal's hind leg locked up for a short period, rendering it immobile (Ali *et al*., 1984).

The disease is found all across the world, although it is more prevalent in the Indian subcontinent. The working bullock is the most commonly affected animal, but the disease also affects cows (Vaughan,1960; Gadgil, 1963). This is caused to the tension placed on the femuro-patellar articulation's tendon and immature ligaments by intense work. The incidence of UFP was lowest in the summer and highest in the winter (Dass *et al.*, 1983; Sutradhar, 2003).

In short, the patella slides up over the trochlea of the femur, stretching the medial patellar ligament over the medial trochlear ridge and potentially preventing the patella from returning downward (Dass *et al.*, 1989; Sutradhar, 2003). When the stifle is stretched, the patella rides dorsally, and the medial patellar ligament becomes 'hooked' over the medial ridge of the trochlea of the femur, according to Bone *et al*., (1963). This viewpoint was shared by Ali *et al*., (1984). Due to ligament relaxation in the later stages of pregnancy, the symptoms are accentuated (Tyagi *et*

al., 2001). Although there are several indications of patellar upward fixation, the most common one is lameness soon after rest (Mondal *et al*., 2013). At rest, the animal's posture is normal, but any attempt to move it rearward must be resisted. Every stride brings the affected limb forward with a jerky bending. The symptoms in some animals are so severe that they are unable to move due to total limb extension. The patella was not in its original position when the trochlea was palpated, and the medial patellar ligament was stiff (Ali *et al*., 1984).

The medial patellar ligament in the stifle joint is crucial for medial patellar desmotomy during upward patellar fixation in surgery. The most common and only successful treatment in bovines for correcting upward patella fixation is medial patellar desmotomy (Ali, 1984; Tyagi, 2001). Because of little or no blood, no suturing, and rapid healing with reduced postoperative morbidity, the stab/close approach is frequently preferred for medial patellar desmotomy (Sharma, 1984). When using the blind approach, two or more efforts to incise the medial patellar ligament are required if the ligament is not severed completely (Ramkrishna, 1972). It is critical to identify the medial patellar ligament in the blind approach, which is not easy to do without knowing the topographic anatomy of this ligament, as it becomes thicker, harder, and less elastic with upward fixation of patellar ligaments (Tyagi *et al*., 1973).

The upward patellar fixation has received minimal attention in Bangladesh (Hossain, 1980, Ali *et al.*, 1984, Rahman *et al.*, 1984, Sutradhar, 2003). The following goals guided the development of this study:

1. To diagnose upward patellar fixation.
2. To learn about operative procedure.
3. To learn about post operative management.
4. To observe the effect of sex, age , breed on the occurance of UFP.

MATERIALS AND METHODS

Study area and duration: The study was conducted at Upazila Veterinary Hospital, Anowara , Chattogram from February 2021 to April 2021.

Animal used for study : 5 dairy cattle of various breeds were found to have upward patella fixation.

Clinical History: At rest, the animal's posture was normal, but when they attempt to move the backward was met with resistance. Every step involved bringing the injured limb forward with a jerky flexion. The hind limb was stuck in extension in acute cases. During walking, the toe drags along the ground.

Clinical examinations: The presenting indications were carefully observed during distance inspection Finger tips were used to palpate the afflicted area. The medial patellar ligament was stiff, rigid, and less elastic, and the patella was missing in its natural place.

Diagnosis: The anamnesis and clinical examination were used to make the diagnosis. The index finger was used to establish the middle point by positioning the thumb and middle finger between the tibial tuberosity and the top spot of the femoral medial trochlear crest, respectively. The medial patellar ligament was easily identified in this method.

Surgical procedure: The cows were placed in lateral recumbency, with the affected limb facing the ground and the upper unaffected hind limb dragged forward and tied to the forelimbs. A rope was used to lengthen, traction, and hold the operated limb in place. The articulation of the tibia, femur, and patella was aseptically prepared for surgery. Local analgesia was obtained by injecting 5ml of 2% Lidocain hydrochloride into the space between the tibial creast and medial patellar ligament. The location was located on the medial aspect of the stifle joint by sliding the index finger upward along the cranial border of the tibia until the cranial tibial tuberosity

was reached. The middle patellar ligament was targeted since it is the largest and thickest of the three. The finger was slided into the groove between the middle and medial ligaments at the level of the medial condyle of the tibia. A substantial cord was felt as the medial ligament. A small stab incision was made with a blade, and the medial patellar ligament was severed with a curved blade to use the close technique of medial patellar desmotomy (MPD). The animal was then allowed to take a walk to see whether the medial patellar desmotomy was successful.

Postoperative care:

The postoperative treatment consisted of a systemic antibiotic combined with a pain reliever. Penicillin-streptomycin mixed preparation (Streptopen, Reneta) was given as an antibiotic. Streptopen 2.5gm powder was injected intramuscularly after being diluted with 10ml distilled water. 10ml of Melvet (Acme) was given subcutaneously as a pain reliever. The wound should be dressed with povidone iodine on a regular basis. Throughout the trial, the animals were monitored for recovery and problems.

Table 1 : Types of drug , generic name , trade name, doses and routes used in this study

SL. No.	Drug used	Generic name	Trade name	Dose	Route
1	Antibiotic	Penicillin Streptomycin	Inj.Streptopen (Reneta)	10 ml	IM
2	Antihistaminic	Pheniramine meleate	Inj.Niravet (Opsonin)	10 ml	IM
3	NSAID	Meloxicam	Inj. Melvet (Acme)	10 ml	SC
4	Anaesthetics	Lidocaine HCl	Inj.G Lidocaine (Gonoshasthya)	5 ml	Local
5	Disinfectants	Povidon iodine	Sol. Viodin (Square)	Required amount	Local

Fig 1 : Dragging of leg

Fig 2 : Casting of animal

Fig 3 : Palpation of ligament at stifle joint

Fig 4 : Infiltration of anesthesia at stifle joint

Fig 5 : Cutting of the medial patellar ligament

Fig 6 : After recovery

RESULT AND DISCUSSION

After the operation, all five of the treated animals were fully recovered. In all cases, desmotomy was performed blindly in a lateral recumbent position. The operated animals were kept under postoperative observation and relaxation.

Table 2: Effects of different variables on the occurrences of upward patellar fixation

SL No	Species	Age (Year)	Sex	Breed	Type	Method of operation	Affected leg		
							Right	Left	Both
1	Cattle	3	Female	Local	Dairy	Blind	√		×
2	Cattle	5	Female	Local	Dairy	Blind	√		×
3	Cattle	4	Female	Cross	Dairy	Blind			√
4	Cattle	3	Male	Cross	Dairy	Blind	√		×
5	Cattle	6	Female	Local	Dairy	Blind	√		×

Upward patellar fixation is a common functional disorder of the femoro-pateller articulation in large animals. Although it is not a life-threatening event, it has a significant impact on animal welfare if left untreated. In some individuals, especially cattle in grass, spontaneous recovery occurs (Weaver, 1986). Because of the etiology, it is clear that animals who labor hard are more likely to be impacted. However, it was discovered that in the Anowara Thana, the majority of the affected animals were female and ranged in age from 3-6 years.

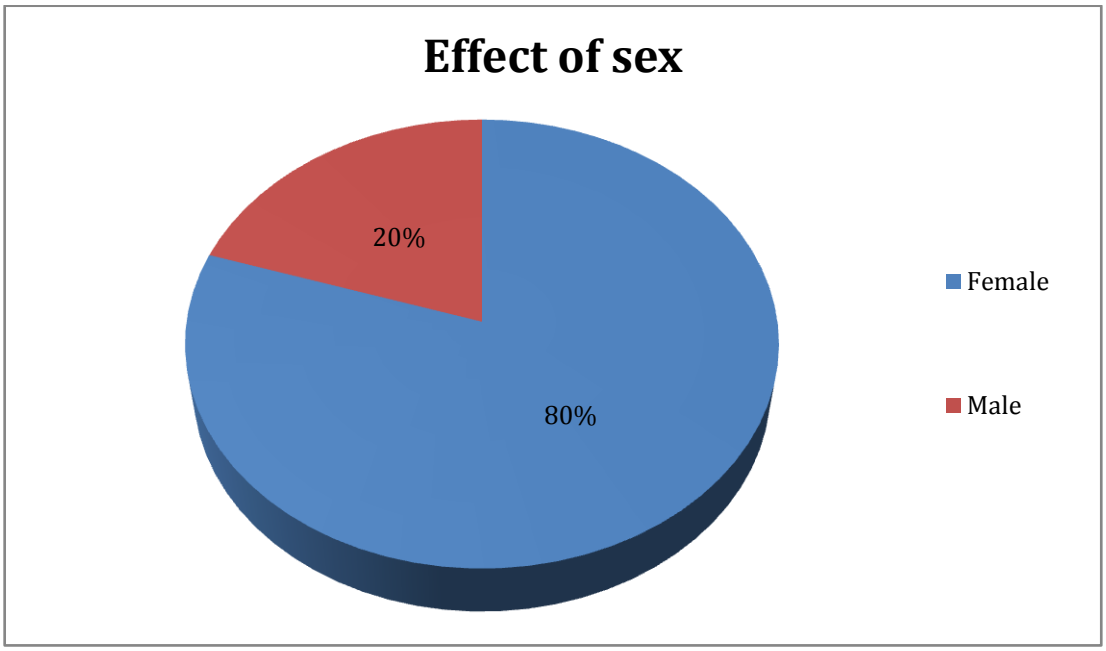

Fig 7 : Effect of sex on occurance of UFP

These findings was not similar with the findings of Dass *et al*.,(1983), which found that females were less prone to than males. However, Gadgil, 1963, supports these findings, stating that the male-to-female ratio was 1:2, while Sutradhar, 2002, also stated that the female and male percentages were 59 and 41, respectively. In this study, percentage of female cattle was 80% and male cattle was 20%.

However, the majority of the cases in this study were female. It could be as a result of- i. Farmers give importance on dairy farming. ii. Ploughing and transporting are now done by mechanized means so that bull farming is decreasing. iii. Artificial insemination (AI) reduces the desire to raise bulls.

According to Patra in 1954, hard work may not be a primary factor because the sickness also affects cows. Krishnamurthy *et al*., 1978 stated clearly that sex had no relation on this illness status. Furthermore, no author observed this condition in crossbred animals, especially in males because males were not utilized for draft purposes as they are humpless and disposed at an early stage.

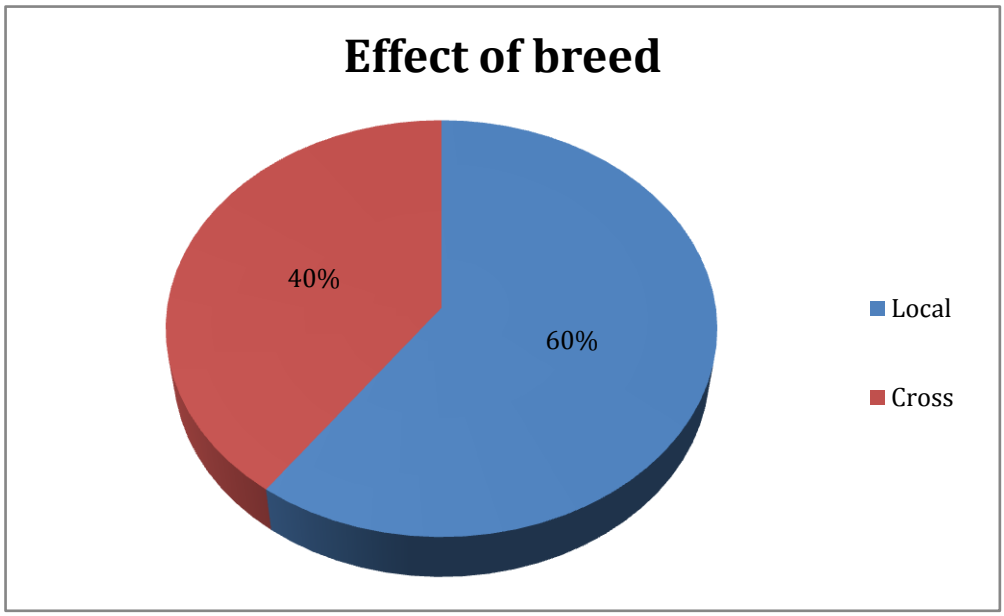

Fig 8 : Effect of breed on occurance of UFP

But in this study , UFP occured in 60% in local breed and 40% in cross breed. It was not simillar with the findings of Dass *et al*., (1983). The author detected no upward patellar fixation in crossbred animals in his study location of Chota Nagpur, India. The author reasoned that crossbred animals were typically stall fed with a nutritious diet. However, in this study region the animals were nutrient deficient with no stall feeding.

According to this study, the dairy cows developed this disorder because some cows were on a poor diet while others were in good physical shape. In 1960, Vaughan stated that either a bad diet or some form of metabolic stress in animals predisposed them to this illness. Due to confinement in shed, lack of exercise might lead to upward patellar fixation.

Animals with upward patellar fixation have a dangerous non-inflammatory condition. As a result, this problem must be corrected. The best treatment for this problem is surgical operation. Ramakrishna stated in 1972 that desmotomy is the best treatment for the condition. In 1984, Ali stated that medial patellar desmotomy was the best successful treatment. In 2003, Sutradhar also recommended the medial patellar

desmotomy for the treatment of this problem. The blind method of desmotomy was used in all 5 cases in this study because it produces a minimal skin wound. Experience must require to perform a medial patellar desmotomy by blind method. However, the surgeon must be careful while passing the blade to cut the ligament. The medial patellar ligament becomes thick, rigid, and less elastic, making it easy to recognize (Tyagi *et al*., 1973). A successful medial patellar desmotomy is indicated by a crushing sound and immediate relief of jerky movement of affected leg.(Tyagi *et al*., 2001).

CONCLUSION

Blind methods of desmotomy were done in 5 affected cases of upward patellar fixation in cattle during the investigation. The medial patellar desmotomy was found to be the best treatment for upward patellar fixation. The disease was also shown to be common in cattle older than three years. These findings show that the surgical approach of medial patellar desmotomy was done at lateral recumbency of animal which was effective and simple to conduct. Females were more vulnerable than males and ranged from 3 to 6 years. Local breeds were more prone to cross breed. Finally, it appears that dietary deficit is the most essential element influencing its etiology.

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BIOGRAPHY

I am **Nayan Deb Nath**, son of **Haripada Deb Nath** and **Jharna Rani Devi**. I passed Secondary School Certificate (S.S.C) examination in 2013 followed by Higher Secondary Certificate (H.S.C) in 2015. Now I am an intern doctor under the Faculty of Veterinary Medicine, Chattogram Veterinary and Animal Sciences University. As an upcoming veterinarian I would like to dedicate my rest of life for the welfare of animals. I am keen to be a field veterinarian as well as pet practitioner.