

CHAPTER 1: INTRODUCTION

Goats play an important role in the economy of Bangladesh (Kabir et al., 2004). Many farmers of our country are landless and marginal and they depend on this small ruminant for food and economy (Paul and Saadullah, 1991). So, goat is called “Poor Men’s Cow” in our country. The population of goat in Bangladesh is 30.33 million (Banglapedia, 2014).

Coenurosis, also known as Gid or staggers, is a localized, space occupying fatal disease of the central nervous system caused by invasion of *Coenurus cerebralis*, the larval stage of the canine tapeworm *Taenia multiceps* or *Multiceps multiceps*. The adult worm lives in the small intestine of dogs, and others canids (Soulsby, 1986). Although sheep and goat represent the common intermediate host for this tapeworm, it can also be seen in camel, deer, pigs, horse and rarely in cattle and humans (Yoshino and Momotani, 1998). Infection occurs as a result of grazing in pastures contaminated with dog feces and subsequently larval invasion of the central nervous system occurs with the development of clinical disease (Sharma and Chauhan, 2006). Pathogenesis is related with the migration of the parasitic stage into the nervous system. The majority of cases result in the death of the animal from starvation after some weeks.

Coenurosis has been reported from time to time in various herbivores and first recorded the since 17th century (William, 1967). The neural form of coenurosis is caused by the larval stage of *Multiceps multiceps* in goat was reported first from Lahore, Pakistan (Greig, 1977). The disease was reported in goats from Bengal (Dey, 1909) and Ceylon (Southwell, 1912). The disease has been reported in goat by Bhalla and Negi (1962), Sharma and Tyagi (1975) and Singh and Singh (1972) in Bangladesh. *Coenurus cerebralis* in the brain and spinal cord of sheep, goat, cattle, horse and wild ruminants and occasionally in cattle during maturity stages (Greig, 1977).

Coenurosis in the goats is an endemic disease of Bangladesh; one study reported the incidence to be 5.2 % among the surgical diseases in goats in Bangladesh (Hossain, et al., 1999). Another study reported the disease having a prevalence of 2.4% (Nooruddin et al., 2000). Due to development of the cyst in brain, the animals start showing nervous signs. These sign comprise ataxia, stumbling paralysis, frequent muscle fasciculation, anorexia, dullness, grinding of the teeth, and blindness in severe condition, incoordination and erratic movement (Sharma, 1998; Doherty et al., 1989). Histopathological examination revealed multiple scolices growing on the internal layer of the cyst, neuronal degeneration, necrosis and demyelination in the affected cerebrum (Nourani and Kheirabadi, 2009). There is no effective medical treatment against the disease. The affected animal leads to death unless the cyst is surgically removed from the brain.

CHAPTER 2: CASE PRESENTATION

Clinical History: A 3 year old female Jamunapari goat approximately 30 kg was brought to the Upazilla Livestock Office, Rangpur Sadar, Rangpur with a history of anorexia, rapid breathing and head pressing against the inanimate objects. The animal was fair in body condition. On clinical examination, the animal showed circling and incoordinated movements (Figure 1). Palpation of the occipital bone just behind right horn revealed softening (Figure 2).

Clinical examination and disease diagnosis: Rectal temperature was taken which was 103⁰fahrenheit. Pulse rate was taken by palpating femoral artery which was 80/min. Respiratory rate was recorded which was 25/min. Care was taken not to excite the animal before or during counting of the respiratory rate. A thorough clinical examinations were conducted and the information regarding age, sex, breed and health status were recorded. Based on all these clinical signs, it was diagnosed as a case of Coenurosis or gid disease and decided to perform a surgery.

Restraining and anesthesia: Both physical and chemical methods were used to control the goat. The animal was placed in lateral recumbency by keeping the affected side upper and tied rope in order to limit movement during surgery. After restraining, Aminocaproic acid (Injection Hemosin, Chemist laboratories Ltd, Bangladesh) was injected intravenously to control bleeding. The surgical site was located just behind the horns. After thorough cleaning and shaving (Figure 3), the surgical site was soaked with tincture iodine. Anesthesia was obtained by local infiltration of 2% lidocaine hydrochloride solution (Inj.Jasocaine, Jayson Pharmaceuticals Ltd).

Surgical Techniques: A half-moon shape incision was given to make four flaps each of which was detached from the subcutaneous tissue by blunt dissection (Figure 4). Bleeding was checked by applying gauge pressure (Figure 5). The subcutaneous tissue and the thin bone were scrapped and a hole was made sufficiently large enough with the help of a tissue forceps (rat-tooth forceps) to remove the cyst. A probe was gently

introduced a bit and circling was done so that cyst can come out easily. Then the cyst was slowly removed by gently holding it with tissue forceps (Figure 6). Utmost care was taken not to allow the cyst to rupture and pour the fluid into the brain. Before suturing the skin sulphanilamide powder (Pulv. Sumidvet, Square pharmaceuticals Ltd) was applied over the wounds. The flaps were closed by simple interrupted sutures with non-absorbable suture (nylon) (Figure 7). A small bandage was then applied over the wound.

Post-operative care: After surgery, sufficient fluid replacement and antibiotics were administered daily for 5 days. Antibiotics, combination of Streptomycin-penicillin (Inj. Sp vet, Acme Laboratories Ltd) was administered intramuscularly 3ml/animal once daily for 5 days and 200 ml of 0.9% normal saline was given intravenously/animal to maintain the fluid level. It was advice to keep the animal in a clean house and not allowed to rub its head. No complication was noted and the animal had an uneventful recovery. On 11th day the suture was removed and it was noticed that the surgical site was healed completely.



Figure. 1: Characteristic circling movement observed in the goat



Figure. 2: Softening of the skull bone found by palpation.

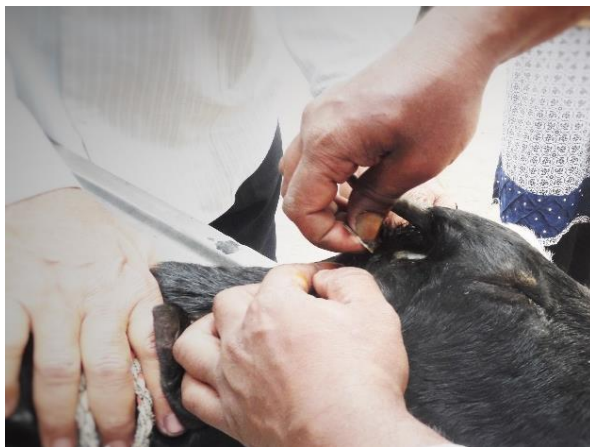


Figure. 3: Cleaning and shaving of operative area.



Figure. 4: A half-moon shape incision is given to make flaps.



Figure 5: Bleeding checking by applying gauge pressure



Figure 6: Cyst slowly removing by gently holding it with tissue forceps



Figure 7: Skin was sutured with nylon after removal of cyst from brain.

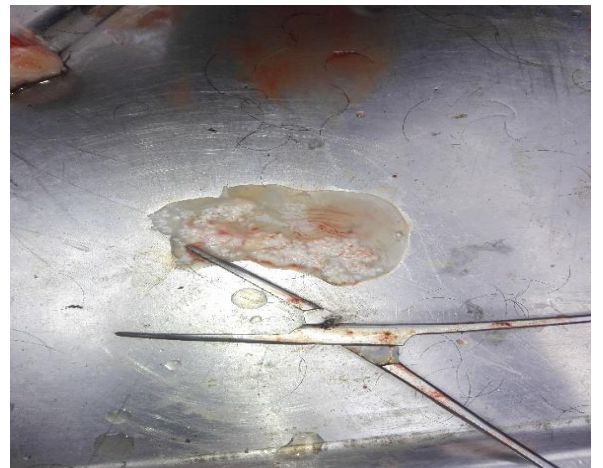


Figure 8: Cyst with scolex that were removed from brain

CHAPTER 3: RESULTS AND DISCUSSION

Coenurosis is a parasitic disease of central nervous system caused by the larval stage of *Taenia multiceps* which affects various ruminant species particularly sheep and goats and occasionally humans. In the present case, a goat with suspected Coenurosis was underwent surgery to remove cyst from the brain. Systematic clinical examination of the animal demonstrated the following symptoms: incoordination, irregular gait, failure to hold the head straight, leftward head tilt and circling. The size of the lymph nodes, status of the conjunctivas, respiratory rate, heart rate, bodytemperature and rumen movements were within physiological limits. The typical clinical signs of cerebral Coenurosis were observed, similar to those reported by Ramoler et al. (1973). Clinical symptoms in *C. cerebralis* vary depending on the location of the cyst (Sharma and Chauhan, 2006). In *C. Cerebralis*, cyst had been reported to often localize in the central nervous system. Studies showed that 96% of the CNS cysts are located in the left or right hemisphere and 4% are located in the cerebellum (Nourani and Kheirabadi, 2009).

In this study, the infected goat was a female with age of 3 years. Females are more vulnerable to the infection compare to male (Amin et al., 2013). Scott (2012) described age variation in case of sheep. The disease is commonly reported in animals aged between 6 to 18 months, but rarely reported in animals older than 3 years. Some of the ecological variable those are considered to be the influencing factors for Coenurosis include rainfall, relative humidity and temperature (Rashid et al., 2000).

The Coenurosis in goat was diagnosed based on presenting clinical manifestations and softening of skull. Previously diagnosis has been made in goat using ultrasonography (Biswas, 2003). The position of the cyst in the brain is the most important information required to remove a cyst and ultrasonography is useful for locating the cyst within the

brain. However, ultrasonography provides very limited information about the positioning of cyst. There detailed neurological examination along with ultrasound provides better efficiency to locate and remove the cysts in goats (Biswas, 2003).

In the present study, the anesthesia was performed by local infiltration of 2% lidocaine hydrochloride whereas general anesthesia was also used in some of the studies described by Misra and Behi (1991). A good pre-operative preparation is required and should include haematologic and blood chemistry values, but laboratory investigation of blood parameters was not followed during the present study which is a limitation of this study.

In the current study, we determined a cyst of 4 cm size in the caudal portion of the brain. The size of this cyst was reported in other studies (Yoshino and Momotani, 1988; Dinevet al.,1999). The diameter of the cysts located in the brain are reported to be 0.5-6.5 cm in sheeps (Güçlüet al., 2006),and 2-3 and 5-6 cm in calves (Dinevet al., 1999).

In this case the success rate was 100% and the goat showed significant clinical improvement after surgical removal of cyst. And no complication was seen after surgery.

Limitations

This discussion is based on a follow up of the patient about 10 days after surgery. The owner did not express any complications at this time. However, complications of the surgery like cerebral edema and seizures may occur later.

CHAPTER 4: CONCLUSION

The technique of surgical extraction of coenurus cyst from the brain under local anesthesia was described with no post-operative complication and uneventful recovery. Surgical removal of cyst from the brain may result 100% recovery. History and clinical findings were found to be useful in diagnosis clinical cases in field level.

CHAPTER 4: REFERENCES

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Biography

Growing in a middle class family I found my childhood as a most delectable part of my life. I was lucky enough that this congenial family environment helped me a lot to broaden my mind and to be a social, naive and rational human being. I want to create this world a better place where the human and animal can live happily without any strife. This thought helps me to be more affectionate to the animal. I am fortunate to make my journey of life through CVASU as I am going to be a veterinarian in the future. Having had the opportunity to work in different veterinary institutions in Bangladesh and India I have become more ambitious and confident about my profession. I will be very glad if I can create some impacts in the development of livestock and poultry industry of Bangladesh. I have interests in infectious disease epidemiology, molecular biology and public health. I like to read autobiography and listen to music in my leisure time. The only thing I care in this world that is my family. The stem of my dream and aim spreads out around it. I want my journey as a veterinarian will be more eventful.

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