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Non-cerebral coenurosis in small ruminants: Report of five cases

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Abstract

The Present study included five cases of small ruminants with swelling at different region of body that were presented to Department of Veterinary Surgery and Radiology, College of Veterinary Science, Proddatur. History revealed no deworming and vaccination schedule in all the five cases. Physical examination revealed that the swelling were soft and fluctuating with fluid like consistency. Fine needle aspiration revealed clear fluid and hence the cases were tentatively diagnosed as coenurus cyst, later confirmed by microscopic examination and were treated surgically.

Keywords: Small ruminants, microscopic examination, non cerebral coenurosis, surgical management

Introduction

Coenurosis is caused by larval metacestode or bladder worm stage of *Taenia multiceps*. Domestic and wild carnivores such as dogs, jackals, foxes and coyots are the definitive hosts whereas domestic and wild ruminants such as sheep, goats, cattle, buffaloes, yaks, horses and pigs are the intermediate hosts. Individuals, often children become intermediate hosts when they accidentally acquire the infection by ingesting eggs upon exposure to the faeces of definitive hosts (El-On *et al.*, 2008) [4]. In Intermediate hosts, it is manifested as cerebral and non-cerebral forms. The cysts in sheep are more cerebral, while are non-cerebral in goats. Non- cerebral coenurosis is mainly reported in asian countries and is manifested as subcutaneous, muscular, orbital and visceral coenurosis (Azizi *et al.*, 2020) [1]. This may cause severe tissue damage, reduction in production, losses in breeding and considerable economic loss due to condemnation of the infected organs of the herbivorous animals and even death of the animals in cases of heavy infestations (Radfar *et al.*, 2005) [7]. Nevertheless it was shown that sheep and goats were infected by both cerebral and non-cerebral coenurosis (Oryan *et al.*, 2014) [6]. The larval stages of *Multiceps gaigeri* and *M. skrjabini* were previously believed to be responsible for non-cerebral coenurosis in goats and sheep respectively until recently when modern studies have adopted *T. multiceps* as the causative agent for both cerebral and non-cerebral coenurosis in sheep and goats (Varcasia *et al.*, 2022) [10]. The present article gives a detailed report of non-cerebral coenurosis in small ruminants.

Materials and Methods

The present study included four cases of sheep and one case of goat presented to Department of Veterinary Surgery and Radiology, College of Veterinary Science, Proddatur. Case 1, a two year old ewe weighing around 35kgs was presented with a large foot ball size swelling on the medial aspect of thigh region of left hind limb (Fig.1). Case 2, a two year old female ewe weighing around 28kgs was presented with swelling at lateral neck (Fig.2). Case 3, a three months old ram weighing around 8 kgs was presented with swelling at the base of ear (Fig.3). Case 4, a three months old ram weighing around 7 kgs was presented with swelling at lateral neck region (Fig.4). Case 5, a six months old doe weighing around 10 kgs was presented with intraocular swelling (Fig.5). History revealed no deworming and vaccination schedule in all

the five cases. Physical examination revealed that the swelling were soft and fluctuating with fluid like consistency. Fine needle aspiration revealed clear fluid and hence the cases were tentatively diagnosed as coenurus cyst. As all the physiological parameters were within the normal range, it was decided to remove these cysts surgically. Surgical sites were aseptically prepared (Fig.6a) and animals were sedated with Xylazine hydrochloride @ 0.1mg/kg body weight and local analgesia was achieved with 10ml of 2% lignocaine hydrochloride. For case-1, animal was placed in lateral recumbency and cyst was exposed after separating the overlying muscles (Fig.6b). Accidentally the cyst was punctured and fluid spilled out (Fig.6c). The ruptured cyst was clamped with digital pressure and separated and removed from fibrous wall (Fig.6d). The outer fibrous wall was also removed completely (Fig.6e). The muscles were sutured with chromic catgut no. 1 with continuous lockstitch suture pattern (Fig.6f), skin was sutured with silk by horizontal mattress sutures (Fig.6g) and then Tincture Benzoin seal was applied (Fig.6h). Similar surgical procedure was followed for removal of cyst in other four cases (Fig.7). Among five cases, only one cyst was removed without any perforation and the cyst was bladder like thin translucent with clear fluid and cluster of invaginated scolices tightly attached to inner surface (Fig. 8). Microscopic examination of protoscolices revealed rostrum with four suckers as well as rostellum with double crown of hooks (Fig.9). Sutures were removed on 12th post-operative day and all the animals recovered uneventfully without any complication or reoccurrence.



Fig 1: Swelling on the medial aspect of thigh



Fig 2: Swelling at lateral neck

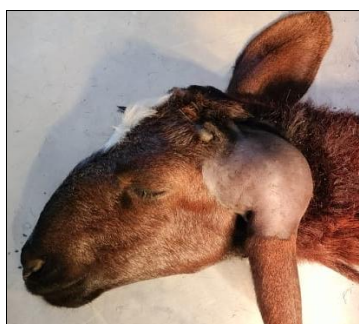


Fig 3: Swelling at base of ear



Fig 4: Swelling at ventral neck region.



Fig 5: Intraocular swelling.

Results and Discussion

Non-cerebral coenurosis or muscular coenurosis refers to the occurrence of coenurus cysts in locations of a host other than the brain and spinal cord (Christodoulpulos *et al.*, 2016) [3]. No case had the history of circling movements which suggests that cerebral cysts were not present. This finding was in accordance with the findings of Sami *et al.*, 2012 [8] where the authors observed no coenurus cysts in carcasses of coenurus affected sheep (n=4) and goat (n=32). Further it can be concluded that non-cerebral coenurosis is more common than cerebral coenurosis in both sheep and goats. Increased incidence in sheep might be due to increased rearing of sheep compared to goats. Cysts were observed in different locations like thigh region, neck region, base of ear and even intraocular. Various other locations of coenurus cysts are neck, pre-scapular region, abdomen (Shiv Prakash and Reddy, 2009) [9] visceral cavity of serous pericardium, myocardium, thoracic cavity, diaphragm, abdominal cavity and pelvic inlet (Venkatesan *et al.* 2014) [11]. Incidence was seen in the age group of three months to two years. Eventhough the first two cases were of two years, cysts were of one year old. These findings suggest that coenurosis is commonly seen in young small ruminants of below one year age. The cysts remained in the same size for over a year which confirms that cysts take months to attain a final size and may remain for years due to the protective covering of thick fibrous capsule around the thin bladder like translucent cyst. Clinical investigation revealed absence of calor, dolor and rubor (Bordoloi *et al.*, 2015) [2]. Eventhough non-coerebral cysts are of not harmful and do not produce any clinical sign other than swelling, they may cause mechanical interference if the cyst is of large size and located on the inner thigh and may predispose to ocular injuries in case of proptosis seen with ocular coenurosis. Surgical excision of cysts is the only treatment option and it provides not only relief to the animals but also improve the economic value. As it is of zoonotically important steps should be taken to prevent the coenurosis which can be achieved by regular antihelminthic treatment of farm dogs with an effective taeniocide (i.e. praziquantel @ 5mg/kg body

weight) at 6-8 week intervals and proper disposal of carcasses to prevent scavenging by herding and stray dogs (Varcasia *et al.*, 2022) ^[10]. Remaining healthy sheep in the flock should be administered with Fenbendazole and Praziquantel @ 7.5mg/kg BW orally and herbal liver tonics to relieve stress and increase immunity (Jalajakshi *et al.* 2022) ^[5].



Fig 6a: Aseptic preparation of surgical site



Fig 6b: Dissection of underlying muscles to expose cyst



Fig 6c: Accidental puncturing of cyst



Fig 6d: Separation and removal of cyst from fibrous wall



Fig 6e: Complete Removal of fibrous capsule

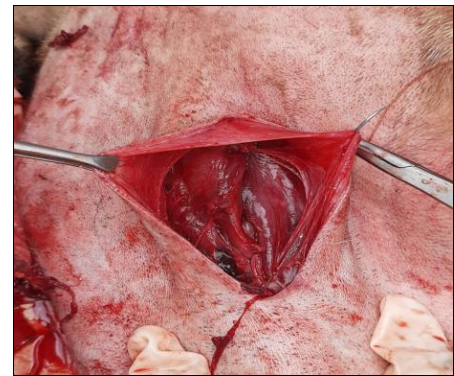


Fig 6f: Closing of muscle layers



Fig 6g: Skin suturing



Fig 6h: Application of Tincture Benzoin seal



Fig 7: Surgical removal of cysts in case 2-5



Fig 8: cyst was removed without perforation in case 4



Fig 9: Microscopic examination revealed four round suckers and a rostellum with a double crown of hooks

Conflict of Interest

Not available

Financial Support

Not available

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