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Surgical management of aural haematoma in canines with modified Marshall Putney's technique (Button Suture Technique)

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Abstract

The present study was conducted at Veterinary Clinical Complex, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar, Haryana. Three male dogs were presented with a complaint of ear swelling with constant head shaking. Fluid-filled, soft fluctuant swelling was observed on concave surface of pinna under physical examination. Diagnosis was carried out on the basis of history, clinical signs and auriculocentesis which revealed blood-tinged fluid confirming aural haematoma or othaematoma. Modified Marshall Putney's technique was performed to treat aural haematoma under general anaesthesia. Protective pressure bandaging was applied after surgical technique. Post-operatively, broad spectrum antibiotic, anti-inflammatory and anti-histaminic drugs were administered for 5 days intramuscularly. Sutures were removed on 14th post-operative day. All the three dogs had fruitful recovery without any complication.

Keywords: Modified Marshall Putney's technique, Aural haematoma, Othaematoma

Introduction

Aural haematoma is an abnormal accumulation of blood or serum usually between the cartilage and medial surface of ear pinna. It is most commonly encountered ear affections in dogs (Ott, 1974)^[9]. Blood or serum and fibrin clots are accumulated in between the choncal cartilage and skin of ear usually involving the concave surface of the pinna. (Fossum *et al.*, 2007)^[4]. Generally, aural haematoma in dog is due to self-inflicted trauma to the ear. The great posterior auricular artery and maxillary vein are the source of haemorrhage, which arborized over the pinna, by pawing, vigorous head shaking or scratching of ear with paw which causes rupture of small blood vessels and start of haemorrhage. Excessive shaking or scratching can cause rupture of these blood vessels and capillaries resulting in bleeding. This causes the ear to fill up with blood tinged serosanguineous fluid in the space between skin and cartilage leading to formation of "haematoma", causing the ear flap to become thickened and initially soft. The bleeding continues until the pressure created by the pooling blood equalizes with the pressure from the arteries themselves. Parasites such as ear mites or ticks, allergy and foreign bodies in or near the ear canal, are also some predisposing factors for aural haematoma (Mayer, 1957; Archibald, 1974; Slatter, 1993; Henderson and Horne, 2003)^[7, 2, 11, 5]. Stephenson (1941)^[13] noted the association of otitis externa with the aural haematoma and Otodectic mange was reported in most of the cases. Although othaematoma in dogs does not disturb the other systemic function, it renders the cosmetic look of animal and makes the dog restless. Dog often scratches the affected ear and shakes the head. Surgical treatment or drainage is necessary because without treatment pinna is shrivelled and subsequent ossification of cartilage mass causes continuous irritation. Scarring and shrivelling of pinna may cause obstruction of external orifices of canal and thus induce chronic otitis externa (Sherding, 1994)^[10]. If left untreated, then haematoma mature with fibrin formation leading to fibrosis on the walls of haematoma, contraction and thickening of walls potentially assuming a curled-up conformation often called "cauliflower ear" (Medleau and Hnilica, 2006)^[8]. Various surgical techniques are available for treatment of aural haematoma (Macqueen technique, Zepp's technique, indewelling drain technique etc.). The first consideration in therapeutic management of othaematoma is correction of underlying cause of irritation, which stimulated the dog for violent head shaking and scratching. Most common conservative treatment for relieving acute pain is fine needle aspiration but chances of reoccurrence are very common.

Metal staples induces severe inflammatory responses as compared to sutures (Fick *et al.*, 2005) [3]. Silicon drain technique is more suitable from cosmetic point of view for docile dogs as compared to PVC performed drain, latex drain and conventional surgical technique (Ahirwar *et al.*, 2007) [1]. The main goal of treatment is to remove blood clots, obliterate dead space and preserve the phenotypic appearance of affected ear. Keeping in view of above facts, present study was carried out with a goal of early recovery and minimum post-operative complications.

Material and Methods

The present clinical study was conducted on three male dogs suffering from aural haematoma which were brought to Veterinary Clinical Complex, Lala Lajpat Rai University of Veterinary and Animals Sciences, Hisar, Haryana. All dogs were managed by Modified Marshall Putney's technique. Clinical signs recorded were constant head shaking, holding of head on one side, ear scratching with paws and fluid filled fluctuating swelling over concave aspect of ear. Then auriculocentesis was performed and blood-tinged fluid was noted. Surgery was planned for fluid drainage and haematoma correction.

Treatment

All the dogs were kept off feed for twelve hours and water was withheld for at least six hours prior to surgery. Premedication was done with Atropine sulphate @ 0.002 mg/kg b.wt. intramuscularly. Xylazine hydrochloride (1 mg/kg b.wt) and Ketamine hydrochloride (5 mg/kg b.wt) was given intramuscularly for induction and intravenously for maintenance of anaesthesia. Dogs were restrained in lateral recumbency keeping the affected ear upside (fig. 1). The affected pinna on both, concave and convex side was properly shaved, scrubbed with chlorhexidine solution and painted with Povidone Iodine solution. The ear canal was plugged with sterilized cotton gauze to avoid fluid drainage in ear canal.

Surgical Technique

Modified Marshall Putney's technique (Button suture technique): After aseptic preparation of surgical site, a linear incision was made on concave surface along the entire length of haematoma. The serosanguinous fluid along with blood clots and fibrin was drained out (fig. 2). The cartilage and internal lining of integument was scrapped and freshened. The flushing of cavity was done with normal saline solution to remove clots. Then cavity was irrigated with povidone iodine solution. Through and through horizontal interrupted mattress sutures with monofilament nylon were applied parallel to incision site without tension along with buttons to obliterate the dead space (fig. 3). Triple knots were applied over convex surface of ear pinna. A tight protective pressure and absorbent bandage was applied over the ear and the ear was placed in dorsum of neck to prevent slipping of the bandage using adhesive tape to immobilize the ear (fig. 4). The average time for completion of surgery was 20 to 25 minutes.

Post-operatively, broad spectrum antibiotic Ceftriaxone @ 20 mg per kg body weight and anti-inflammatory drug meloxicam @ 0.3 mg/kg body weight were administered intramuscularly for 5 days. Ear bandaging was changed once in two days and surgical wound dressing was done with povidone iodine solution and Neosporin powder. Owner was advised to keep the dog at clean place and not allow to rub its

operated ear, for that Elizabethan neck collar was recommended.

Results and Discussion

Sutures were removed on 14th post-operative day (fig. 5) and all the three dogs were recovered uneventfully without reoccurrence. Incidence of aural haematoma depends upon etiological factor. These underlying causes incites the dog for ear scratching and head shaking which ultimately results into rupture of small blood vessels causing extravasation of blood, later on blood is coagulated and clots are formed. In the present cases, incidence of aural haematoma was due to excessive scratching of ear with paws and rubbing of head against the hard objects due to irritation caused by presence of ectoparasite on body, thereby causing injury to blood vessels of ear resulting into development of haematoma. Several techniques have been reported in literature for management of aural haematoma. The preferred method of treatment involves surgical correction of the haematoma. The ultimate aim of each surgical technique emphasis on preservation of phenotypic appearance of operated ear which is achieved by removing blood clots and obliteration of dead space. Modified Marshall Putney's technique used for present study involved use of less sutures and proper obliteration of dead space. Average time required for surgery was 20-25 minutes which is less than the conventional technique (Macqueen technique). However, time required in stainless steel stapling is less than the Modified Marshall Putney's technique (Mattoo *et al.*, 2007) [6] but staples induces severe inflammatory responses as compared to sutures (Fick *et al.*, 2005) [3].



Fig 1: Pre-operative picture showing swelling on concave side of ear



Fig 2: Peri-operative picture after drainage of haematoma



Fig 3: Post-operative picture showing button suturing



Fig 4: Post-operative picture showing adhesive tape bandaging of ear



Fig 5: Post-operative picture after complete recovery

Conclusions

The prognosis for aural haematoma in dogs is good to excellent as long as the underlying cause is addressed. Healing of surgical wound was faster with this technique. Post-operative complications like suture engorgement, suture dehiscence, pus development, were not recorded. Reoccurrence of haematoma was not observed in any of the dog.

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