Evaluation of zepp's procedure in management of chronic otitis externa in dogs

Abstract

The study was conducted on 10 dogspresented at VCC,VSR,CVAS Bikanerwith the owner complaint of consistent shaking of head and scratching of ear, rubbing of ear to hard object, purulent foul smelling discharge from earand also had history of long medicinal treatment using NSAIDS,steroids and antibiotics. Clinical otoscopic examination of the ears revealed purulent odoriferous discharge, with stenosis and calcification of lateral ear canal in some cases. For definitive diagnosis ear exudate was collected in sterile swabs inserted in lateral ear canal using otoscope, and it was evaluated for parasites, bacteria, fungi, yeast. Skull radiography was performed to evaluate calcification in the ear canal and involvement of middle ear. After thorough examination it was concluded that the animals were suffered from chronic otitis externa and decided to perform zepps procedure (lateral ear canal resection) to increase drainage, facilitate ventilation of ear canal and easy placement of topical agents into horizontal ear canal. Zepp's procedure was performed under general anaesthesia;post-operative care was done using regular application of topical steroids, nonsteroidal anti-inflammatory drugs and antibiotics along with systemic antibiotics. After one month of post-operative care four ear showed excellent healing and dryness of the ear, Infection subsided in three ears and no improvement was seen in three ears.Microbiology suggested mixed bacterial infection in 6 dogs. Zepp's procedure is a conservative surgical operation found to be a choice of surgical managementin cases of early stages of otitis externa which has not been progressed to otitis media.

Keywords: zepp's procedure, chronic otitis externa, lateral ear canal resection

1. Introduction

otitis externa accounts for up to 20% of hospital admissions in dogs and 7% in cats (Cole, 2006) and canines with otitis externa frequently have concomitant otitis media (up to 89% of affected canines),Otitis externa can afflict cats and dogs of any age or breed, however it is more prevalent in dogs with lots of hair in the ear canal (like Poodles) and long, pendulous ears (like Spaniels and Basset Hounds) (lehner, 2010).Despite the straightforward diagnosis based on clinical indications and physical examination, the disease has a complex aetiology; therefore more research is frequently necessary to identify the cause or causes. Both bacterial and fungal origins have the potential to cause ear infections. It has been stated that the main cause of canine otitis externa is *Malasseziapachydermatis*(Bond, 2010).Moreover, it is recognized that Staphylococcus, Pseudomonas, Escherichia, and Proteus species are significant pathogens that cause otitis externa in dogs when it comes to bacterial agents (August, 1988; Rosychuk and Luttgen, 2000; Krahwinkel, 2003). Zamankhan (2010)classified the causes of otitis externa into three categories: main, predisposing, and perpetuating factors.Primary factors include otic parasites like Otodectescyanotis, hypersensitivity diseases (food allergies, atopic dermatitis, contact hypersensitivity), endocrine disorders like hypothyroidism, oticneoplasia, and foreign bodies. These conditions can directly affect the external ear canal and result in otitis. The most frequent primary cause of canine otitis media is underlying hypersensitivity illness (Saridomichelakis, 2007). Predisposing variables do not cause otitis externa; rather, they increase the ear's susceptibility to the condition.When the underlying cause of the ear canal inflammation is no longer present or active, there are still elements that can exacerbate the condition. These are known as perpetuating factors. The history and the dog's otoscopic, dermatological, and general examinations are used to make the diagnosis. Early initiation of appropriate medical treatment is recommended in order to address the underlying cause(s) of the condition (August, 1988; Chester, 1988). Chronic otitis externa often results from treatment-resistant

disease that often does not improve.The vertical and horizontal ear canals may narrow as a result of proliferative hyperplastic epithelial alterations brought on by a worsening of chronic otitis externa (Krahwinkel, 1993).As the horizontal ear canal gets blocked or stenosed, the hyperplastic alterations finally become irreversible (Smeak and Kerpsack, 1993). The care of chronic otitis externa has included surgical treatment on a significant basis (Bradley, 1988; Hobson, 1988; Krahwinkel, 1993). The techniques employed are total ear canal ablation with lateral bulla osteotomy (TECA/LBO), vertical ear canal ablation (VECA), and lateral ear canal resection (LECR; modified Zepps operation) (Krahwinkel, 1993; Doyle *et al.,* 2004).Lateral ear canal resection (Zepp's procedure) is recommended in patients with mild hyperplasia of the ear canal epithelium or with small malignant lesions of the lateral side of the vertical canal. Ventilation and drainage within the ear canal are enhanced via lateral ear canal resection. It also promotes introduction of topical medicines into the horizontal canal (Fossum, 2013).

2. Materials and methods

The present study was conducted on 10 dogs of different ages and body weights presented to the Clinics section of the Department of Surgery and Radiology, College of Veterinary and Animal Science, Rajasthan University of Veterinary and Animal Sciences, Bikaner with the owner's complaint of consistent shaking of head and scratching of ear, rubbing of ear to hard object, purulent foul smelling discharge from ear he also gave history of long medical treatment using NSAIDS, steroids and antibiotics were given.Clinical otoscopic examination of the ears revealed purulent odoriferous discharge, with stenosis and calcification of lateral ear canal in some cases. Allanimals presented were of age groups ranged from 2 years to 11 years (mean age 6 years) and their body weight varied from 12 kg to 32 kg (mean body weight 24 kg). After thorough examination we concluded that the animal was suffered from

chronic otitis externa and decided to perform zepps procedure (lateral ear canal resection) to increase drainage, facilitate ventilation of ear canal and easy placement of topical agents into horizontal ear canal.

Hemato-biochemical examination was performed in all dogs to evaluate health status of animal and their fitness for the surgery. For definitive diagnosis ear exudate was collected in sterile swabs inserted in lateral ear canal under the guidance of otoscope, and it was evaluated for parasites, bacteria, fungi, yeast. Skull radiography (Figure6) was performed to evaluate calcification in the ear canal and involvement of middle ear (otitis media).

Otoscopic examination and skull radiography was used to diffentiate otitis externa to otitis media. Recurrent or medically non-responsive otitis externa was classified as chronic otitis externa. All surgical procedures were performed under general anaesthesia using a standard surgical technique (Krahwinkel, 1993) by same surgery team.

2.1 **Preparation of animals**

The dogs were fasted for 12 hours and withheld water for 6 hours before the induction of anaesthesia.

2.2 Pre-anaesthesia and induction of anesthesia

Intramuscular administration of atropine sulphate (@0.04 mg/kg body weight), xylazine hydrochloride (@1mg/kg body weight), and ketamine hydrochloride (@5mg/kg body weight) were used in that order. The injections were given after 15 and 10 minutes, respectively.Following complete induction of anaesthesia endotracheal intubation was done in each dog with endotracheal tube of appropriate size (No. 5.5 -9.0) depending on dog size. The cuff of the endotracheal tube was inflated with air and connected to anaesthetic machine having isoflurane vaporizer. Every dog in both groups received an injectable dosage of dexamethasone sodium phosphate (0.025 mg/kg body weight).

2.3 **Maintenance anaesthesia**

Maintenance of anaesthesia in the dogs was performed by inhalation anaesthesia with Isoflurane USP.

2.4 Surgical procedure

The surgical site was prepared in an aseptic manner after clipping the entire side of the face and both sides of the pinna (Figure1). With the infected ear facing upward, the dog was put in a left lateral recumbency position. Length of vertical ear canal was identified by positioning forceps in the canal (Figure2). Mark a site below the horizontal canal which is half the length of vertical ear canal. Skin incisions were given on either side of the vertical canal extended from tragus upto the start of horizontal canal which should be 1.5 times in length of vertical ear canal (Figure3). The skin flap thus formed is transacted from the ventral attachment and is reflected dorsally thus exposing the cartilaginous wall of vertical ear canal Now the vertical ear canal is resected from pretragic incisures to horizontal ear canal and intertragic incisures to horizontal canal such that both the incisions are parallel to each other and can form a drain board at base of horizontal ear canal. Reflect the cartilage flap distally (Figure 4) and examine the opening of horizontal canal. Obtain the cultures by sterile swabs. The reflected cartilaginous flap is sutured to skin distally such that it can form a rectangular drain board using nylon no.1 in simpleinterrupted suture pattern (Figure. 5).

Aggressive post-operative care was done by topical administration of steroids, nonsteroidal anti-inflammatory drugs and broad spectrum antibiotics in conjunction with parenteral administration of antibiotics (Buback *et al*., 1996).

The dogs were kept under observation for 24 days and dressed regularly with spirit and sterile gauge. Injection of ceftriaxone tazobactum @ 25 mg/kg body weight was given intravenously twice a day for 6 days. For initial 3 days Meloxicam at the dose rate of 0.5 mg/kg was given intramuscularly for pain managementdays and advised alternative day

wound dressing and to apply an Elizabethan collar to prevent self-mutilation of surgical site. Sutures were removed on 10th post-operative day.Physical parameters like age, body weight, surgical parameters physiological parameters, hemato-biochemical parameters and post-operative complications were studied.

Either a physical assessment of the dogs or a phone follow-up four months or longer following surgery was used to determine the treatment's effectiveness.

Using the criteria established by Gregory and Vasseur (1983), the surgical outcomes were assessed as follows: excellent if clinical signs were resolved with little to no care needed by the owner; improved if clinical signs occasionally recurred and required professional attention; or poor if there was no improvement.

3. **Results**

Ten animals of age groups ranged from 2 years to 11 years (mean age 6 years) and body weights varied from 12 kg to 32 kg (mean body weight 24 kg) were selected for the said procedure which were presented to the clinics section of CVAS bikaner with the history of rubbing and scratching the ear, pus like discharge and no response towards long term medicinal treatment (up to 3 months). Thorough examination revealed that the animals were suffered from chronic otitis externa and were good patients for zepp’s procedure (lateral ear canal resection) to increase drainage, facilitate ventilation of ear canal and easy placement of topical agents into horizontal ear canal. All the animals had the history of no responsiveness towards prolonged medical treatement. Haematobiochemical study was done to evaluate the patient health status for surgery. Skull radiography was done to evaluate the calcification of vertical ear canal, stenosis of vertical ear canal and involvement of middle ear if any. Four ears showed outstanding results, three showed improvements, and three showed poor results. After the Zepps procedure, three of the dogs that did not fare well underwent TECA/LBO surgery on the infected ear. Based on the cultural study of ear discharge, seven cases had

Staphylococcus, three had *Pseudomonas*, and two had *E. Coli*. In six cases, ciprofloxacin proved to be the most effective antibiotic, followed by gentamicin in four and amoxicillin in two. Post-operative complications were wound dehiscence in 8 cases, abscess formation in 3 cases, facial nerve paralysis in one case

4. Discussion

When medical treatment fails and any underlying systemic disease that may predispose to otitis externa has been cured or controlled, surgery has proven to be a crucial component of the appropriate management of chronic otitis externa. In order to allow for ear canal drainage, enhance the environment inside the horizontal ear canal, and make it easier to examine, clean, and treat the ear canal, LECR have been indicated (Grono, 1970).

To be effective, these treatments must be administered prior to the horizontal ear canal becoming irreversibly narrowed, and they must be combined with ongoing medical therapy for the ear ailment (Krahwinkel, 2003). In ten ears (100% cases), Zepp's procedure (lateral ear canal resection) was conducted. 30% ears completely failed the surgery, whereas 70% ears showed satisfactory follow-up results. This contrasts with the 34.9% (Tufvesson, 1955), 47% (Gregory and Vasseur, 1983), and 55% (Sylvestre, 1998) previously documented poor surgical response rates. Gregory and Vasseur (1983) describe otitis externa as a complex condition with numerous etiologies, not all of which respond well to lateral ear canal resection.The cases were followed for 4 months after surgery, if the animals do not recover, the treatement was declared failed, and then the further surgical options like TECA/LBO could be applied.

If an underlying case of otitis media is present at the time of operation, unsatisfactory outcome is likely (Lane and Little, 1981). Otitis media can develop as a result of otitis externa; it has been documented in 16% of early episodes of otitis externa and in 52% to 83%

of dogs with chronic otitis externa (Spreull, 1964; Cole *et al.*, 1998). It's crucial to keep in mind that otitis media might be challenging to diagnose since, according to Cole *et al*. (1998), 71% of instances of otitis media have the tympanic membrane intact.

5. Conclusion

The animals in the study plan were of age groups ranged from 2 years to 11 years with varying body weights from 12 kg to 32 kg, which clearly indicates that chronic externa is affecting every age group and body weights. Otitis externa is one of the commonly occuring ear affection in dogs with leafy/pendulous ears, due to presence of long ear canal and hairs in and outside ear pinna, despite of being easily diagnosed by external examination it becomes tedious to treat it medicinally due to their ineffectiveness and reoccurrence of the disease, so appropriate identification of causative agent and effective management is prerequisite of the treatement plan. Due to recurrent episodes of infection after rigours medicinal treatment, it is advisable for surgical intervention. Zepps procedure is adopted when the ear canal is normal or having reversible changes and otitis externa is in its early stages and not advanced to otitis media, Zepps procedure is helpful in early course of disease and if this procedure fails, it is advisable to go fir Ventral ear canal resection/ total ear canal resection or bulla osteotomy.

Conflict of interest: Author revealed there was no conflict of interest.

Acknowledgement: I am highly thankful to Dr P. Bishnoi, Professor & Head, Department of surgery and radiology; Dr. M. Tanwar, Assistant professor; Dr. S.K. Jhirwal, Assistant professor without whom this work was not possible.

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Figure 1: surgical site was prepared aseptically

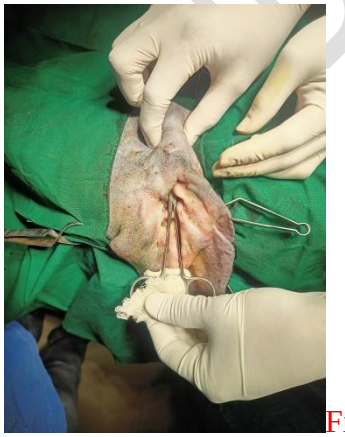


Figure 2: Length of vertical ear canal was identified by positioning forceps in the canal

Figure 3: Skin incisions were given on either side of the vertical canal extended from tragus upto the start of horizontal canal

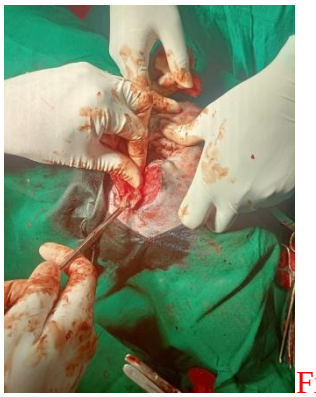


Figure 4: cartilage flap was reflected distally

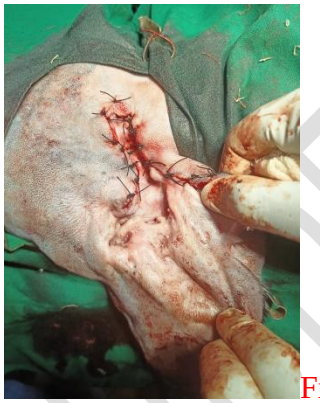
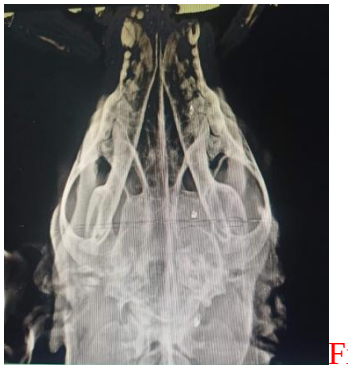


Figure 5: cartilaginous flap is sutured to skin distally thus forming the drain board

 Figure 6: Skull radiograph showing stenosed ear canal