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THE EVALUATION OF THE EFFICIENCY OF OSTEOTOMY OF THE TYMPANIC BULLA IN MEDIUM OTITIS IN DOGS

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Abstract
Medium otitis is the result of an inflammatory process.
Osteotomy of the tympanic bubble can be recommended with very good results in the extension of inflammatory processes with a chronic character in osteitis or neoplastic processes at this level. Actually more efficient is doing lateral osteotomy in the case of dogs if we take into consideration the anatomical particularities. The observations were made on 5 dogs, of ages between 6-9 years, diagnosed trough clinical examination and complementary examination methods like neurological examination and X ray examination, that suffered from chronic suppurative otitis media.
The surgical approach is done on the lateral side, over the external auditory canal, to the horizontal part of it, dilacerations of the auditory canal until cranial level, where we make an incision on the canal so that we can perform the osteotomy of the bubble. The osteotomy of the bubble was done using an adequate milling machine specially made for this purpose. The compromised (necrotic) bone part was removed in 2 cases in a proportion of 50%. In all cases the cavity of the bubble was cleaned with betadine solution with a concentration of 1‰. After 14-21 days after surgery the evolution was good.

Key words*: dog, osteotomy, recurrent otitis.*

INTRODUCTION

The evolution of otitis media due to numerous etiological factors responsible for various clinical signs especially those with neurological disorders, peripheral vestibular syndrome represented by hearing loss, hemifacial paresis, facial nerve paralysis, keeping the head tilted toward the affected side, balance disorder, miosis, narrowing of the palpebral fissure, ataxia, are other clinical findings in otitis media.
Radiological examination of the tympanic bulla is very important in assesing the degree of damage to the bone at this level, but lack of tissular reaction does not exclude otitis media opinion shared by (Gotthelf L.N., 2000), both in acute and chronic stages. Chronization is accompanied by bone proliferations of the tympanic bulla wall (Farrow J., 1992;
Gotthelf L.N., 2000) in this stage radioopacity is high. Chronic inflammatory process causes the tympanic affected bula size to exced the unaffected one.
When by clinical and paraclinical investigations the diagonsis is acute otitis media, accompanied by dystrophic mineralization of soft tissue, bone reaction or the presence of cholesteatoma surgical procedure must be performed.

MATERIALS AND METHODS

Osteotomy of tympanic bulla was performed on 5 dogs of different breed, age and sex, with variable weight (20-35 kg), (Labrador Retriever 7y M, Cocker Spaniel 8y F, German Pointer 8y M, Poodle 8y M, German Shepherd 9y F) presented at Surgery Clinic of Veterinary Faculty in Cluj from 21.10.2013 to 20.12.2014 with auricular disorders.
The dogs presented had signs of recurrent chronic otitis, accompanied by peripheral vestibular syndrome.
At clinical examination we observed ataxia, nystagmus, head tilting (fig.1.), strabismus, loss of balance and locomotor difficulties. On three patients the owners reported retching

and regurgitation. On four cases anisocoria with ipsilateral miosis, narrowing of the palpebral fissure and enophthalmia was observed. In addition to clinical examination a neurological evaluation and radiographic examination was performed. Neurological examination revealed disorders such as peripheral vestibular syndrome, hearing loss and Horner syndrome. At the radiological exam (dorso-ventral exposure) the tympanic bulla became radiopaque (fig.2). Surgical procedure was lateral osteotomy of the bulla.

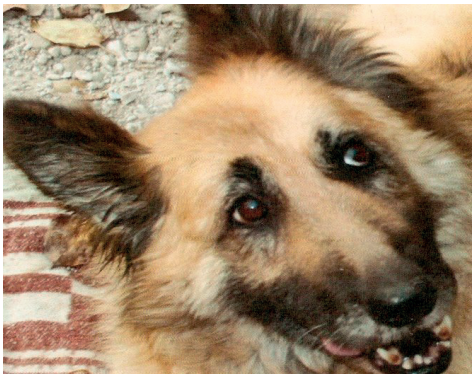

Fig. 1. Balance disorders in raising and Locomotion

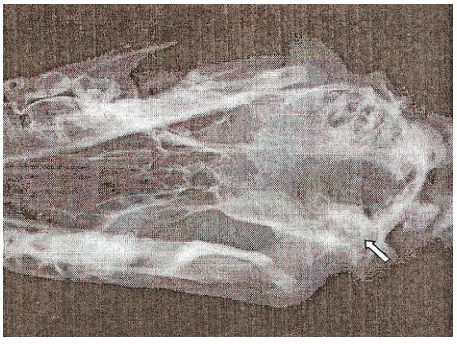

Fig. 2. Dorsal exposure in which is observed the undefined and opac aspect of the timpanic bubble

The anesthesia was performed in all cases by narcosis with Isoflurane 2%. The protocol performed was Athropine 0,04 mg/kg i.m, a premedication with Diazepam 0,2mg/kg i.m folowed by Ketamin 10% 3mg/kg i.v, after that the patients were intubated and mantained with Isofulrane.

The surgical field was prepared aseptically. Skin incision was performed over the auditive canal outside with an ventral extension under the horizontal ear canal (fig. 3).

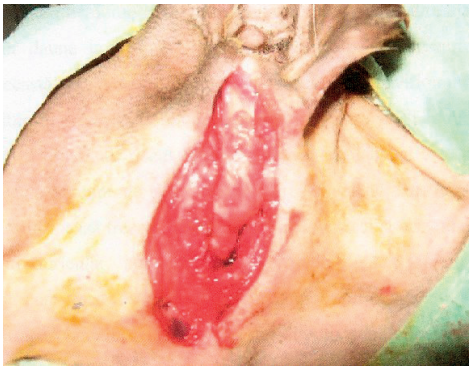

Fig. 3. Skin incision from the tragus to the Horizontal canal

The incision is continued till the jonction level of the ear canal, horizontal part with vertical part. The vertical ear canal, is freed from the surrounding tissue through dissection, during which hyperplastic tissue or necrotic portions can be resected (fig. 4). A circumferencial incision is made around the ear duct, till the ear cartilage. It is recommended to avoid bleeding from the ear rostral artery and vein and avoid damage the auriculotemporal and auriculopalpebral nerves.

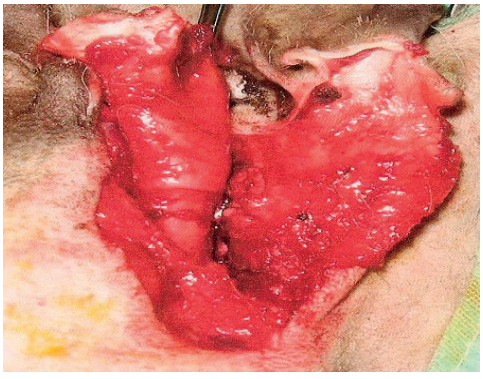

Fig. 4 Incision arround the ductus with exposure of the external auditive ductus

At the stilomastoidiene hole level facial nerve is located, we have to take care not to retract it to hard ventral. In two cases the facial nerve

was caught in the reacted tissue. Dissection continues along the horizontal duct up to the cranium level. In this way we released and exposed to bone acoustic meatus (fig. 5).

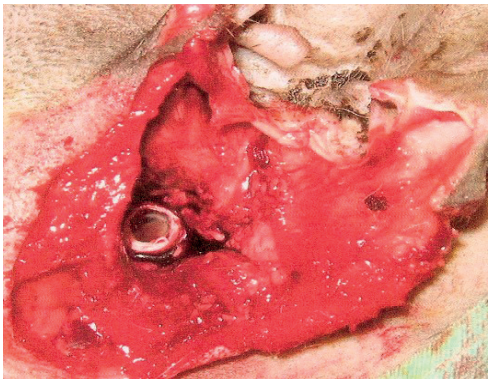

Fig. 5. Resection of the external auditive ductus

Tympanic bulla osteotomy was performed using a drill, procedure that allows visualization of the tympanic cavity. Ventrolateral area of the tympanic bulla is removed with a bone burr suitable for this purpose. Caudal portion is affected largely which is why osteotomy should be expanded rostral and caudal. In two cases removal was done in 50% proportion (fig.6). It is necessary that ventromedial bone till the ear canal to be removed, an be able to perform the curettage. Tympanic cavity was cureted to remove any content from the secretory epithelium, remnants of the tympanic membrane or duct, etc., tympanic cavity is washed with warm saline, followed by Terramycin spray.

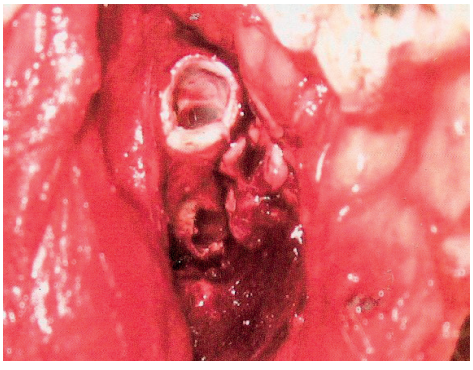

Fig. 6. Lateral osteotomy of the bubble, followed by total resection of the ductus

Wound closure was done with 4-0 absorbable suture and skin with silk in simple interupted suture.

RESULTS AND DISCUSSIONS

Lateral osteotomy of tympanic bulla was performed in five dogs diagnosed with chronic recurrent otitis after total ear canal ablation. Lateral osteotomy of the tympanic bulla after total ear canal ablation is a complicated procedure with a degree of difficulty and high potential for neurological deficits. The presence of a purulent content in the tympanic bulla requires rapid surgery, avoiding the risk of infection spread and subsequent complications like osteomyelitis or meningitis. In some circumstances where, in middle ear is found modifications associated with neurological symptoms, the only possible efficient treatment consists in applying surgery. Progrosis after surgery depends greatly on the time they were done, because chronic otitis media can be complicated by alterations of the tympanic bulla bone structure, when the prognosis is reserved.

From the 5 cases who had undergone surgical intervention, four of them were cured, while one occurred amelioration. Postoperatory, in all patients we found signs of nausea and vomiting for a month. In this context, is recommended to avoid progress in the ventral area of the tympanic bulla, because the facial nerve and carotid artery are in this area, to prevent from injuries. Also, during surgery avoid maneuvers that can lead to accidental avulsion of the stapes from the oval window since they can lead to vestibular disorders. This we attributed to the link between central vestibular system and vomiting.

Postoperatory all patients were treated with gentamicin 100 mg / 10 kg, lactated Ringer's fluidoterapie, glucose, Duphalyte for 3-5 days and vital signs were monitored. Postoperatory the first 3-4 days the animals presented immobility, loss of appetite, head-shaking, vestibular syndrome and febrile reaction 39.4 ^{0} C. In one of the dogs we found the second postoperative day pharyngeal edema with respiratory distress, which made to be monitored and ensured oxygen therapy.

Daily wound management was performed by irrigation with saline solution to draine the inflammatory exudate. Gradually, from the 8th day postoperative edema and inflammatory phenomena began to retreat, physiological constants gradually returned to normal, so 14-16 days postop evolution was favorable. We found a complete cure in 4 patients at 30 days after surgery.

CONCLUSIONS

Lateral osteotomy of the tympanic bulla with ear duct ablation remains a very efficient method in chronic inflammatory disorders with affected bone walls.

The neurological signs before and after surgery, may compromise the surgical act, reason why precocity of correct diagnoses and surgery remain essential.

Damage the intimate components of internal or middle ear and neural elements during the surgery may compromise the success of the operation.

Postoperative adequate treatment must be given several days until recovery is complete.

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