

CASE REPORT

Partial ear canal ablation and lateral bulla osteotomy in rabbits

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Six lop rabbits were presented with clinical signs of otitis media or externa. The presence of disease was confirmed by computerized tomography examination, with two rabbits suffering from bilateral disease. The rabbits were anaesthetized and underwent surgery of the affected bulla. Rabbits with bilateral disease had a minimum of 2 weeks between procedures. A single vertical incision was made over the base of the vertical canal, which was bluntly dissected free from surrounding tissue. The ventral portion of the vertical canal was removed and a lateral bulla osteotomy was performed. The mucosa at the base of the dorsal vertical canal was apposed and the aural cartilage sutured to form a blind-ending pouch open at the pretragic incisure. Histopathological samples taken from the dorsal margin of the vertical canal yielded subtle and non-specific changes in the six samples submitted. All rabbits were discharged within 48 hours of surgery. The cosmetic outcome was excellent with animals retaining visually normal aural anatomy. The partial ear canal ablation/lateral bulla osteotomy procedure is quick and has a good cosmetic result when performed in rabbits.

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INTRODUCTION

Lop breed rabbits are predisposed to otitis because of their pinna anatomy (Chow 2011, Mayer 2011). Rabbits with otitis externa typically present with headshaking, scratching at the ear, signs of pain when palpating the ear canal, lethargy or swelling at the base of the vertical canal. Rabbits with otitis interna may present with vestibular signs such as ataxia, nystagmus and head tilt. In addition, contracture of the ipsilateral facial muscles can also be seen in these cases. Cases with otitis media alone are difficult to diagnose clinically as many patients have subclinical disease and confirming otitis media can be challenging, although neurological signs may be evident (Chow 2011, Chow *et al.* 2011). In one post-mortem study of 102 laboratory rabbits, 32% were identified with subclinical otitis media (Smith & Webster 1925). In another post-mortem study of meat producing rabbits, 11.5% (of 78 rabbits) had subclinical otitis media, but this rose to 84.9% (of 53 rabbits) with clinical signs of respiratory disease (Deeb *et al.* 1990). Clinically, the diagnosis usually relies on the extension of otitis media to otitis interna and the development of associated clinical signs. However, facial nerve contracture can be identified without vestibular signs and otitis media is found on the ipsilateral side in these patients. Neurological disease is

a common presentation in rabbits (Jeklova *et al.* 2010). Otitis media has been identified in 24% of neurological cases and is an important differential to consider (Jeklova *et al.* 2010). Otitis media can be confirmed using radiography, ultrasonography, aural endoscopy and CT examination (Dickie *et al.* 2003, King *et al.* 2007a,b, Mayer 2011, Chow 2011). CT examination is considered the most reliable method of diagnosis in rabbits and other species (Dickie *et al.* 2003, King *et al.* 2007b, Chow 2011, Mayer 2011).

Medical treatment is often advocated in rabbits with otitis media, but yields poor results in other species (Harcourt-Brown 2002, Taylor 2003). More recently, surgical intervention has been recommended (Capello 2004, Chow 2011). A ventral bulla osteotomy (VBO) has been the favoured method in rabbits with otitis media alone (Chow *et al.* 2009, Chow 2011) and total ear canal ablation combined with a lateral bulla osteotomy (TECA/LBO) has been preferred for cases with otitis media and otitis externa (Chow 2011). Previous recommendations for the treatment of isolated otitis externa have included medical treatment or lateral wall resection (LWR) (Capello 2004, Chow 2011).

The rabbit external ear canal has a unique anatomy. Specifically there are no separate vertical and horizontal ear canals. Instead, multiple cartilaginous plates make up the single “vertical” ear canal. This attaches to a large, vertical, bony acoustic

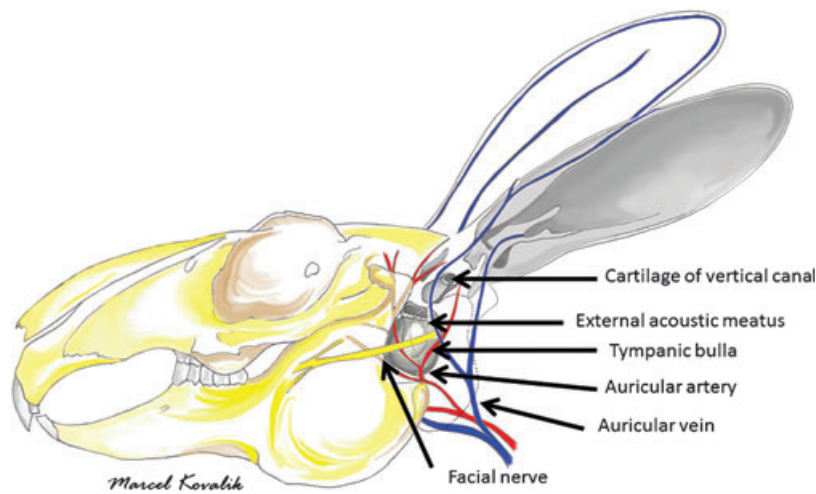


FIG 1. Illustration identifying the anatomy of the rabbit tympanic bulla and ear canal including prominent arteries, veins and nerves

meatus ventrally, and this leads to the tympanic membrane at the ventral aspect of the meatus at the point of entry to the bulla (Fig 1) (Popesko *et al.* 1992, Chow 2011, Mayer 2011). In lop-eared rabbits, the ear pinna and the dorsal section of the vertical ear canal are turned ventrally to form a junction between the cartilaginous plates and the ear canal is stenotic. Some authors believe these anatomical differences predispose lop-eared rabbits to otitis (Capello 2004, Chow 2011).

LWR in rabbits produces poor clinical results and is no longer recommended, because the large bony acoustic meatus prevents effective drainage (Popesko *et al.* 1992, Chow 2011, Mayer 2011). This is similar to findings in the dog in which LWR is associated with a high failure rate despite appropriate case selection (Sylvestre 1998).

As in other species, TECA/LBO is the current recommended surgery for otitis media and for otitis externa in rabbits (Chow 2011, Mayer 2011). This case series reports a novel surgical technique for the treatment of otitis externa and media in rabbits that compares favourably with previously reported results for TECA/LBO.

CASE HISTORIES

Six neutered lop rabbits (three males and three females) aged between two and four years, weighing 2.35 to 3.29 kg underwent a novel surgical procedure for treatment of otitis media or otitis externa between September 2011 and August 2012. Rabbits were presented for vaccinations, health checks or vague clinical signs (such as anorexia or lethargy). Specific clinical signs were usually not noted by the owners, but on clinical examination a soft to firm swelling could be palpated at the base of the vertical canal of the affected ear(s) (Fig 2). Headshaking or scratching of the base of the ear was also occasionally reported.

All cases were subsequently admitted for diagnostic investigation, which was performed within 7 days. Rabbits were sedated with 0.05 mg/kg fentanyl and 2.5 mg/kg fluanisone (Hypnorm injection 0.2 mg/mL fentanyl, 10 mg/mL fluanisone; Janssen)



FIG 2. Picture of typical aural swelling identified during the clinical examination for those cases with otitis externa

given into the epaxial musculature. After 15 minutes, an intravenous (iv) catheter was placed in the lateral marginal ear vein for fluid therapy. Rabbits were given supplemental oxygen by facemask and heat was provided using a water recirculating heat mat. CT examination of the skull without contrast was then performed using a CT Somatom Volume Zoom (Siemens). Images were reviewed by two radiologists, one of whom was a European diploma holder, and by a Diploma holder of the European Board of Zoological Medicine. All cases had otitis media (which was bilateral in two animals) (Fig 3). The sedative effects of fentanyl were reversed with iv 0.5 mg/kg butorphanol (10 mg/mL Alvegesic injection; Dechra) and surgical investigation discussed with the owners.

A partial ear canal ablation and lateral bulla osteotomy (PECA/LBO) was performed within 2 weeks of the CT diagnosis.

Rabbits were injected subcutaneously (sc) with 4 mg/kg ranitidine (25 mg/mL Zantac injection; Boehringer Ingelheim) and 0.6 mg/kg meloxicam (5 mg/mL Metacam injection; Boehringer Ingelheim) after admission.

Rabbits were sedated as above. After 15 minutes, an iv catheter was placed in the marginal ear vein and midazolam (5 mg/mL