Surgical Management of Ear Diseases in Rabbits

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KEYWORDS

• Rabbit • Ear anatomy • Otitis • Ear canal ablation • Bulla osteotomy

KEY POINTS

- Otitis externa and media are common problems in rabbits, particularly in lop-eared breeds.
- Knowledge of rabbit ear anatomy is essential to understanding the disease processes and treatment strategies.
- Surgical intervention is indicated for cases of otitis externa or media in which clinical signs are recurrent or refractory to medical management.
- A full diagnostic work-up, including otoscopic examination and diagnostic imaging, should be performed before surgical management.
- Significant neurologic complications, such as facial nerve paralysis and, less likely, vestibular disease, can occur with surgical intervention but are usually transient.

INTRODUCTION

Ear disorders are common in rabbits, with otitis externa and media being the most clinically relevant. Medical therapy may aid in controlling clinical signs but rarely resolves otitis externa and media because they are often chronic conditions by the time of diagnosis. The increasing use of surgical intervention is proving to be safe and effective. The surgical techniques are analogous to those used in dogs and cats, with some differences due to variations in anatomy. A complete knowledge of rabbit ear anatomy is essential to understanding the disease processes and treatment strategies.

EAR ANATOMY

External Ear

Rabbit ears are dominated by long pinnae that are used for sound amplification, behavioral communication, and thermoregulation. Large blood vessels course through the

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pinna and provide an extensive blood supply that aids in the release of heat. These vessels are often used for venipuncture and intravenous catheterization (generally the medial or caudal auricular veins) because of their size and accessibility.

The ear canal of rabbits is formed by three interlocking cartilages that provide structure to the ear canal (**Fig. 1**). The most proximal (deep) cartilage is the annular cartilage (synonym: cartilaginous acoustic meatus), which forms a ring and arises from the bony acoustic meatus of the bulla. Distal to the annular cartilage are the auricular and scutiform cartilages that form the distal part of the ear canal and the pinna. The tragus, which is proximal portion of the auricular cartilage, connects to the annular cartilage.[1] The existence of a true horizontal ear canal in rabbits is controversial.[2] The vertical ear canal bends to form a very short section, which is oriented horizontally and attaches to the bony acoustic meatus, just distal to the tympanic membrane (see **Fig. 1**).[2,3]

The vasculature of the ear in rabbits is prominent and can be easily visualized by transillumination. The auricular arteries and veins run along the margins and the center of the pinna (**Fig. 2**).

Breed Differences

In lop-eared breeds, there is a 3–5 mm gap between the cartilaginous acoustic meatus and the tragus of the auricular cartilage. Because of this lack of continuous cartilage, the ear folds over on the soft tissue creating a kink in the ear canal. This kink prevents normal ear secretions (cerumen) from draining properly, resulting in accumulation of cerumen and the increased risk for secondary bacterial or yeast infections of the ear canal. The gradual buildup of cerumen and overgrowth of bacteria or yeast leads to chronic otitis externa that is challenging to manage because of the effective stenosis of the canal that prevents adequate flushing and application of topical therapy.[1] In some cases, the increased accumulation of cerumen escapes through the soft-tissue gap between the annular cartilage and the tragus and forms a diverticulum at the base of the ear.[1] This accumulation of cerumen at the base of the ear is commonly referred to as an ear-base abscess, ear-base empyema or aural diverticulosis, which may or may not be infected.[1] In contrast to upright-eared rabbits, which have a fairly wide and rigid ear canal (**Fig. 3**A, B), the ear canal in lop-eared rabbits is narrower and not rigid (**Fig. 3**D, E), predisposing to accumulation of cerumen and development of otitis externa.

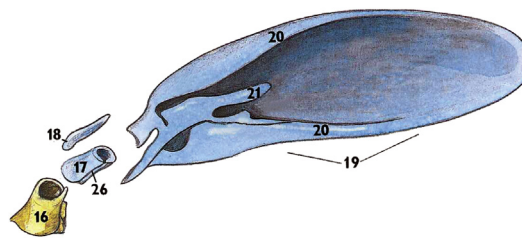

Fig. 1. Cartilages of the ear. The tragus (*21*) interlocks with the annual cartilage (*17*) and scutiform cartilage (*18*) to form the vertical ear canal in rabbits. 16, Bony acoustic meatus; 17, annular cartilage (syn cartilaginous acoustic meatus); 18, scutiform cartilage; 19, auricular cartilage; 20, helix; 21, tragus; 26, cartilaginous incisure of the annular cartilage. (*From* Popesko P, Rajtovà V, Horàk J. Rabbit. In: Popesko P, Rajtovà V, Horàk J, editors. A color atlas of anatomy of small laboratory animals, rabbit and guinea pig, vol. 1. London: Elsevier Saunders; 2002. p. 14–146; with permission.)