ZYMBAL GLAND (AUDITORY SEBACEOUS GLAND) CARCINOMA PRESENTING AS OTITIS EXTERNA IN A PET RAT (*RATTUS NORVEGICUS*)

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Abstract

A 1-year-old sexually intact male fancy rat (*Rattus norvegicus*) was presented for unilateral purulent otitis externa and weight loss. A small amount of bloody discharge was noted at the ostium of the left ear canal. The canal and the surrounding tissue were firm to the touch. Mild left-sided enophthalmos and facial nerve paralysis were noted. Otoscopic examination demonstrated caseous debris, and a swab of the external ear canal demonstrated a mixed population of rods and cocci on cytological evaluation. Bacterial culture of the external ear canal grew *Escherichia coli*. The rat was initially placed on oral and topical antimicrobial therapy. Despite treatment, the condition of the affected ear deteriorated and the rat continued to lose weight. Other clinical signs observed at this time included a worsening of the facial nerve paralysis, head tilt, and circling. A biopsy sample of the swollen tissue surrounding the left ear canal was collected; however, the rat died the day following the biopsy procedure. Histopathology of the biopsied tissue revealed an invasive neoplasm consistent with a Zymbal gland (auditory sebaceous gland) carcinoma. Zymbal glands are modified sebaceous glands surrounding the ear canal of rodents. Although chemically induced neoplasia of these glands is frequently observed, spontaneous tumor formation is much less common. Tumors of the Zymbal gland should be considered as underlying causes for unilateral otitis externa in rats.

Key words: Zymbal gland; auditory sebaceous gland; otitis externa; dermatitis; rat; *Rattus norvegicus*

A 1-year-old, 526 g sexually intact male pet fancy rat (*Rattus norvegicus*) was presented to the Zoological Medicine Service at the Louisiana State University School of Veterinary Medicine Veterinary Teaching Hospital, Baton Rouge, LA, for discharge from the left ear and weight loss. A week before this visit, the rat presented for a health assessment, as another rat in the household had died from suspected *Mycoplasma*-associated chronic respiratory disease the day prior. At the time of the initial presentation, the rat had a body condition score of 4/5 (overweight), with no external abnormalities except for mild swelling and inflammation of the skin over the plantar aspect of the right metatarsus. No overt signs of respiratory disease were detected, and the owner declined further diagnostic tests. Empirical treatment with long-acting doxycycline, 50 mg/kg subcutaneously (Vibramycin SF I.V., Pfizer, the Netherlands), was administered prophylactically for *Mycoplasma* infection, and was to be repeated weekly for a total of 3 injections. The owner was instructed to soak the rat's foot once daily in a 5% chlorhexidine solution and to use a substrate in the cage that would reduce pressure on the plantar surface of his feet.

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At the time of the second doxycycline injection (7 days from the initial presentation), the rat weighed 510 g. Mild respiratory stridor was noted on auscultation although dyspnea was not detected. At this time, a small amount of purulent discharge was noted in the left external ear canal. The owners thought this abnormal finding was secondary to a cage mate in the household licking or biting at the ear. No other abnormalities were noted at this visit. An otic preparation of neomycin sulfate, thiostrepton, triamcinolone acetonide, and nystatin (Animax, Dechra Veterinary Products, Overland Park, KS USA) was dispensed to be applied twice daily to the affected ear. A third injection of doxycycline was given 7 days following this visit (14 days after the initial presentation). No change in the condition of the ear was reported at this time.

The owner returned the rat for a recheck of the otitis 2 weeks later (28 days after the initial presentation). The owner stated that the affected ear had not improved. In addition, the patient had developed a small ulceration ventral to the opening of the left ear canal and had continued to lose weight.

Dermatologic examination revealed a small amount of bloody discharge in the ostium of the left ear canal. The pinna did not appear to be involved. There was a poorly defined swelling on the left side of the face at the approximate location of the vertical ear canal. It was unclear whether the swelling was due to thickening of the ear canal itself, to swelling of the tissues around the canal, or both. A small ulcer was noted on the lower aspect of the swollen area, approximately 2 mm ventral to the opening to the left ear canal. Other external physical examination abnormalities noted included a small amount of dry scale noted along the dorsum, cutaneous swelling and inflammation over the right metatarsus, and the left palpebral opening was somewhat narrowed with concurrent mild enophthalmos. The rat demonstrated a decreased ability to blink upon attempt to elicit a menace response or palpebral reflex (lagophthalmos).

The rat was anesthetized for further examination of the ear and facial lesion as well as cleaning and debridement of the inflamed metatarsal skin. Anesthetic induction was performed via induction chamber using 100% oxygen at 1 L/minute and isoflurane gas at 5%. Once induced, the patient was maintained with isoflurane ranging from 1.5 to 3% at 1 L/minute oxygen flow via facemask. Otoscopic examination demonstrated the presence of caseous debris and a possible ulcerated mass in the vertical ear canal. Evaluation of the horizontal canal was not possible, and the tympanum could not be visualized. A sample of the otic discharge was obtained and smeared on a glass slide, then stained with a modified Wright stain. Examination of the stained slide demonstrated keratinocytes, inflammatory cells (e.g., neutrophils, macrophages, and lymphocytes), and a mixed population of bacterial rods and cocci. A sample of the otic discharge was submitted for aerobic bacterial culture. The ulcerated lesion on the lateral side of the face was cleaned and debrided. No communication between the ulcer and ear canal could be demonstrated. Differential diagnoses for the facial swelling included otic neoplasia with extension into the surrounding tissue (± abscess formation), bite wound trauma with secondary infection, and abscessation extending from an undetected tooth root abscess. An ophthalmologic examination was performed after the otic evaluation, while the patient was still under general anesthesia. Chromodacryorrhea was noted from the nasal canthus of the right eye. Narrowing of the left palpebral fissure and facial asymmetry was detected. Bilateral anterior cortical suture line cataracts were also observed.

The lagophthalmos and enophthalmos that were evident when the rat was conscious suggested the possibility of facial nerve involvement, either within or external to the middle ear. Diagnostic imaging was suggested to identify bony involvement and/or possible otitis media, but was declined by the owner.

The rat was administered meloxicam at 0.5 mg/kg subcutaneously, once (Metacam, Boehringer Ingelheim Vetmedica Inc., St. Joseph, MO USA), enrofloxacin, 10 mg/kg subcutaneously, once (Baytril, Bayer Animal Health, Shawnee, KS USA), and lactated Ringer solution 11 mL subcutaneously, once, while anesthetized. The patient was subsequently maintained on meloxicam 0.5 mg/kg, orally, every 12 hours for analgesia and enrofloxacin 10 mg/kg, orally, every 12 hours for antimicrobial support, pending the results of the aerobic bacterial culture. *Escherichia coli* was isolated from the otic discharge swab, but antibiotic sensitivity testing was not performed. Oral enrofloxacin treatment was continued, and an artificial tears solution was dispensed to be applied q 8 to 12 hours to prevent the development of corneal ulceration secondary to the lagophthalmos.

The owner returned the rat for reexamination 7 days later (35 days after initial presentation). At that time the facial ulceration, otic discharge, and