A canine case of otitis media examined and cured using a video otoscope

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(Received 11 February 2014/Accepted 1 October 2014/Published online in J-STAGE 16 October 2014)

ABSTRACT Otitis media of the left ear was diagnosed by video otoscopic examination in a 7-year-old, intact male Shih-tzu dog (weight, 5.1 kg), that also had three complex ceruminous adenomas and a Pseudomonas aeruginosa infection in the left ear canal. In such cases, total ear canal ablation is usually required. However, a complete cure was achieved in the present case without total ear canal ablation. The complex ceruminous adenomas were excised using a diode laser, and repeated cleansing of the tympanic cavity and ear canal was implemented using a video otoscope. As a result, the ear canal was closed in a U-form, and the otitis media was cured.

KEY WORDS complex ceruminous adenoma, diode laser, otitis media, pseudomonas, video otoscope


The present case was an intact male, 7-year-old, Shih-tzu dog, weighing 5.1 kg. Previous medical history included otitis of the left ear, for which he had received treatment at other clinics for 5 years. During that time, a hand-held otoscope had been used for the examinations, and local and systemic treatments were performed. The local treatment involved the conventional method of instilling a cleaning solution in the ear canal, massaging the base of the ear and then draining the solution, followed by instillation of ear drops [3, 4]. Systemic treatment involved continued administration of antibiotics. Various ear drops were used, and antibiotics were administered systemically, but remission was not obtained. These treatments were continued as the owners took the dog from clinic to clinic, and the dog had become aggressive with respect to treatments. This made treatment difficult, and he was brought to the author’s veterinary hospital for examination. Other than otitis externa, he had no notable medical history.

On general examination, the dog showed a lack of energy and dullness, as well as aggression, because of the pain. His appetite was decreased. No other physical abnormalities were detected, and the right ear was normal. Foul-smelling purulent exudate containing blood drained from his left ear canal and flowed from the left cheek down to the neck (Fig. 1). The vertical canal was filled with blood and fluid, and masses of ceruminous gland adenomas were noted in the horizontal canal.

Blood examination results included an elevated WBC of 14.3 × 10^9/µl (normal value: 6–10 × 10^9/µl), RBC 7.0 × 10^12/µl (normal value: 5.5–8.5 × 10^12/µl), Hgb 15.1 g/dl (normal value: 12.0–18.0 g/dl), MCHC 31.7 p g/dl (normal value: 32.0–40.0 × 10^3/µl), and PLT 475 × 10^3/µl (normal value: 140–400 × 10^3/µl). Biochemical results included Glu 104 mg/dl (normal value: 70–110 mg/dl), total cholesterol 244 mg/dl (normal value: 130–220 mg/dl), total bilirubin 0.2 mg/dl (normal value: 0.2–0.6 mg/dl), AST 10 IU/l (normal value: 0–30 IU/l), ALT 30 IU/l (normal value: 0–60 IU/l), BUN 20 mg/dl (normal value: 8–21 mg/dl), total creatinine 1.0 mg/dl (normal value: 0.6–1.2 mg/dl). There was no abnormality in the liver or kidney function tests.

While cleaning the ear canal in this way, a diode laser (MediPack; Karl Storz Endoscopy Japan, K.K., Tokyo, Japan) under general anesthesia with isoflurane revealed a tympanic membrane defect and otitis media on the video otoscope monitor at a magnification of more than 10x [10, 11]. The examination of the ear canal using a video otoscope (MediPack; Karl Storz Endoscopy Japan, K.K., Tokyo, Japan) under general anesthesia with isoflurane revealed a tympanic membrane defect and otitis media on the video otoscope monitor at a magnification of more than 10x [10, 11]. The three masses were noted in the ear canal. Cytological examination was performed at the time of each treatment. The bacterial culture and susceptibility tests were performed on 3 separate days.

Treatment was done locally using a video otoscope [10, 11]. The video otoscope was inserted into the ear canal, and tissue was extracted using 3-Fr straight grasping forceps via the forceps channel. Subsequently, 3-Fr and 4-Fr feeding tubes (Atom Medical, Tokyo, Japan) were mounted in a 5-ml syringe, and a cleaning solution was injected repeatedly to cleanse the ear canal. The cleansing solution used was polyoxyethylene octylphenyl ether 0.5% (Nolvasan Otic, Kirikan, Ltd., Tokyo, Japan).

While cleaning the ear canal in this way, a diode laser (Asuka Medical, Inc., Kyoto, Japan) was used to resect and remove the three masses. These masses were excised one at a time, on three separate occasions, with the diode laser inserted from the forceps channel of the video otoscope (Table 1). The factors listed below contributed to our decision to perform excisions at 3 different occasions: because (1) Laser reflects diffusely (2) of possible adverse effect on nerves,
and (3) frequent future anesthetic procedures were already in line. Buprenorphine 0.02 mg/kg was administered for pain relief during the laser procedure.

On histopathology [7], three masses in the horizontal canal were complex ceruminous adenomas, and they showed proliferation of glandular epithelial and myoepithelial tumor cells with a few mitotic figures without cellular atypia, associated with intense inflammation.

After resecting and removing the complex ceruminous adenomas, the tympanic cavity and ear canal were cleaned, again using the video otoscope. The ear canal posterior (proximal) to the complex ceruminous adenomas was ulcerated, and a large amount of purulent exudate was seen. The tympanic cavity was filled with purulent exudate. This purulent exudate was drained thoroughly using a tube. After cleaning, amikacin eardrops (20 mg/ml, injectable amikacin diluted 5-fold with artificial tear mytear ophthalmic solution; Senju Pharmaceutical Co., Ltd., Osaka, Japan,) were injected and removed twice.

Bacilli were detected on cytological examination. The bacterial examination showed *Pseudomonas aeruginosa* at the time of the initial examination and *Escherichia coli* on hospital day 12. Based on these results, amikacin was in-

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**Fig. 1.** Foul-smelling purulent exudate containing blood drains from the left ear canal.

**Fig. 2.** The process of recovery after treatment. Day 1: After the first complex ceruminous gland adenoma has been excised, the second and third complex ceruminous gland adenomas are visible. Day 5: Tympanic cavity after the resection and removal of the complex ceruminous adenomas. (After resecting and removing the complex ceruminous adenomas using a diode laser, the tympanic cavity has been cleaned using a video otoscope.) Day 15: A narrowed ear canal opening to the point where only a 4-Fr tube can be inserted. Day 21: The ear canal has closed completely in a U-form (complete recovery).

**Fig. 3.** Schematic diagram before (left) and after (right) treatment. Three complex ceruminous adenomas are present in the left ear canal (left). By the 21st day, the ear canal is closed completely in a U-form, and the refractory otitis media is completely cured (right).
Table 1. Local treatment schedule

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<sup>a</sup> Video-otoscopic therapy was performed on days 1, 3, 4, 5, 6, 7, 8, 10, 11, 12, 14, 15, 17, 19 and 21, for a total of 14 times.
<sup>b</sup> Excision of complex ceruminous adenomas by semi-conductor laser was performed on days 1, 3 and 4, for a total of 3 times.
<sup>c</sup> Bacterial cultures were performed on days 1, 12 and 21.

In the present case, the otitis was not cured with conventional treatment, and tumors were discovered in the ear canal. In such cases, total ear canal ablation would generally be indicated. However, there are many problems with total ear canal ablation, such as disfigurement of the ear and the risk of complications, which include facial nerve injury and secondary complications. But, no alternative methods have been reported. Therefore, a method of treating otitis media using a video otoscope and diode laser was selected instead of total ear canal ablation in the present case.

ACKNOWLEDGMENT. The authors would like to thank Prof. Shuichi Tsuchida of the Nippon Veterinary and Life Science University for valuable advice.

REFERENCES