



Per-Endoscopic Trans-Tympanic Traction Treatment of an Aural Inflammatory Polyp in a Cat

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Abstract A 5-year-old castrated male Maine Coon cat presented with chronic otitis on the right ear. The clinical signs, scratching and head shaking, were recurrent despite symptomatic treatment, including antibiotics and antifungal agents. Video otoscopic examination and computed tomography (CT) examination revealed a polyp in the right ear canal. The polyp was removed via per-endoscopic trans-tympanic traction (PTT) with a grasping forceps. After treatment, Horner's syndrome occurred in the right eye but spontaneously resolved a week later. The mass was diagnosed as inflammatory polyp with a fibrovascular stroma containing plasma cells, lymphocytes, and neutrophils. All clinical signs were improved, and no recurrence was observed after 3 weeks of follow-up. This case report demonstrates that CT scan is effective in identifying the margin of polyp and PTT technique is non-invasive method for treating inflammatory polyp in cats without severe complications.

Key words cat, inflammatory polyp, per-endoscopic trans-tympanic traction, endoscope, otitis externa.

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Introduction

Feline inflammatory polyp is a non-neoplastic mass that is relatively common in cats previously described (11). And feline inflammatory polyp occurs in the epithelium of the tympanic bulla, auditory tube, and grows through the tympanic membrane to the external acoustic meatus or through the auditory tube to the nasopharynx (8). It has been known that the cause of feline inflammatory polyp is not yet known (5). However, it is assumed that the auditory tube is blocked by accumulated inflammatory substances in tympanic bulla, or that there may be congenital or hereditary effects (4,10). According to a previous report (9), it is suspected that innate and adaptive immunity are involved in polyp development. But calici and herpes viruses, which can cause inflammation, are less associated with inflammatory polyps (13). Although it does not show any special clinical signs in many cats at the onset of disease, as inflammatory polyp grows, it can expand into nasopharynx, external acoustic meatus, inner ear, resulting in different clinical signs (8). Based on the previous reports, the upper respiratory signs, which grows to nasopharynx, may show symptoms of stertorous respiration, dyspnea due to physical occlusion, and nasal discharge, sneezing due to irritation (1). If inflammatory polyp affects not only middle ear but also inner ear, different neurological signs such as Horner's syndrome, head tilt, head shaking, facial nerve paralysis, nystagmus, and ataxia can occur (6).

The diagnosis of feline inflammatory polyp can be supported by direct observation of smooth pale pink-colored and roundish, sometimes multilobulated polyp protruding with ear canal or nasopharynx with otoscopy (5,6). CT and MRI, advanced diagnostic imaging, can be also used to determine how much volume polyp occupies in the ear (7,8). Definite diagnosis was made based on histopathology.

Feline inflammatory polyp, which blocks ear canal, is surgically removed to treat. There are several methods for polyp elimination. Traction avulsions is the simplest minimally invasive technique that have lower complications than

other methods of elimination. However, this technique has relatively high recurrence rate (up to 50%) (8). Ventral bulla osteotomy has a low recurrence rate (0-10%) but is highly invasive surgery (2,12). After treatment, many complications can occur, such as Horner's syndrome (11/19), otitis interna (2/19), facial nerve paralysis (5/19) which previously described (5). Per-endoscopic trans-tympanic traction (PTT) technique has recently been introduced. This method is minimally invasive technique and has the advantage of having lower complication (8%) compared to traction avulsion (43%) and ventral bulla osteotomy (57-95%). Also, recurrence rate is low (13.5%) (6). In cats treated with ventral bulla osteotomy, the Horner's syndrome can remain permanently, whereas in PTT technique, it can be treated spontaneously by a temporary phenomenon, even if complication appears (5,8).

This case report is to describe that PTT technique is not invasive treatment in a cat with inflammatory polyp.

Case Report

A 5-year-old castrated male Maine Coon cat was referred for mass in the right ear canal. The cat had history of chronic otitis externa on right ear with scratching and head shaking. The clinical signs did not completely improve despite antibiotics treatment. Otitis media and mass in the right ear canal has been found by computed tomography (CT) examination (Fig. 1). The mass was observed across the horizontal ear canal and tympanic bulla. Video otoscopy (Veterinary otoscope, 67260OSA, Karl Storz, Tuttlingen, Germany) revealed purulent exudates and a polyp in right ear canal (Fig. 2A). For minimal invasive treatment, PTT of mass was selected.

The cat was premedicated 30 minutes before the start of the treatment with butorphanol (0.2 mg/kg, intramuscular injection, Myungmoon Pharm. Co., Seoul, South Korea). Anesthesia was induced in a cat with propofol (6 mg/kg, intravenous injection, Myungmoon Pharm. Co., Seoul, South Korea) and maintained with isoflurane (Hana Pharm Co., Seoul, South Korea). After general anesthesia, the cat was placed

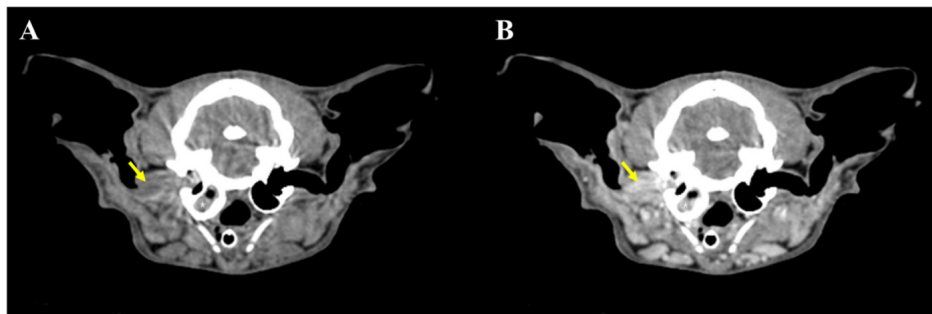


Fig. 1. CT findings of an aural polyp on right ear. (A) Before contrast-enhanced, (B) after contrast-enhanced CT scan. Unilateral tympanic bulla discharges (asterisk), and a polyp (yellow arrow) that penetrates the tympanic membrane are visible on right ear.

in left lateral recumbency. Video otoscopy was performed using 5 mm otoscope with a 5 French working channel (Veterinary otoscope, 67260OSA, Karl Storz). Bacterial and fungal culture, and cytology were performed with purulent exudate. Bacterial and malassezia infections have been identified. The ear canal was flushed with 0.9% saline for removal of purulent exudate and visualization (Fig. 2B). After flushing, a polyp formed in a cylindrical shape with a diameter of 4 mm was found along the ear canal (Fig. 3C). The mass was removed via PTT using 1.9 mm rigid endoscope (HOPKINS Straight Forward Telescope, 64301 AA, Karl Storz) and a rigid grasping forceps (Grasping forceps, 69133, Karl Storz), which passing parallel to the scope (Fig. 3A). Ruptured tympanic membrane and remnant of the polyp inside middle ear were found (Fig. 3B). Using 5 mm otoscope with 5 French working channel and a grasping forceps (Flexible grasping forceps, 67161T, Karl Storz), the remnant of the mass was removed carefully via PTT. Mild bleeding was observed in the middle ear following flushing (Fig. 4). Video otoscopic treatment was ended by aural flushing with a warm sterile isotonic (0.9%) saline. After recovery from anesthesia, Horner's syndrome was temporary observed in the right eye (Fig. 5). Horner's syndrome spontaneously recovered after a week post-PTT. Because the culture for bacteria and fungus was positive, anti-fungal agent, and prednisolone (1 mg/kg, q 12h, Yuhan

Co., Seoul, South Korea) were orally administrated to the cat for 3 weeks. Antibiotics were used for prophylactic purposes. The polyp submitted to the Antech Diagnostics (Antech Inc. Fountain Valley, CA, USA). Histologically, the polyp was diagnosed as inflammatory polyp with a fibrovascular stroma containing locally intense inflammation (Fig. 6). Plasma cells, lymphocytes and neutrophils are present as well as small lymphatic hyperplastic nodules. The surface of the polyp is lined by pseudostratified ciliated columnar cells and there are glands within the stroma, which are also lined by ciliated epithelium and multifocally have luminal neutrophils. The polyp is lined by ciliated epithelium, indicating that it likely originates in the middle ear. No microorganisms or viral inclusions were identified.

The cat was followed up 2 times with a video otoscopy at 1-week intervals. The cat did not have any clinical symptoms, and there were no remarkable findings other than the perforated tympanic membrane.

Discussion

This case report shows non-invasive removal of aural inflammatory polyp by performing PTT in a cat. And CT scan is effective to identify the polyps that need to be removed. There are various techniques removing feline aural inflammatory polyp, but endoscopic technique has the advantage of being non-invasive than the surgical method (5,8). Compared to traction alone, PTT technique has lower recurrence rate, which is similar with that of ventral bulla osteotomy (6). In this case, long-term evaluation could not be confirmed, but since PTT was performed, a low recurrence rate could be expected.

Complications which can occur after removal of the polyp include Horner's syndrome, otitis interna, vestibular syndrome, and facial nerve paralysis regardless of the removal technique (8). However, non-invasive removal methods tend to cause less complications than surgical removal (5). In this case, the cat presented with Horner's syndrome after removal of aural polyp which spontaneously resolved after a week

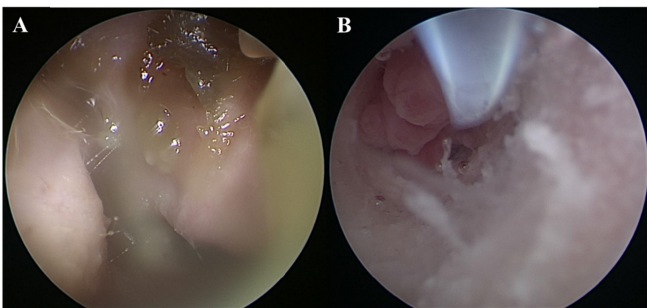


Fig. 2. Purulent exudates and polyps were identified in the right ear via video otoscopic examination. (A) Before flushing, a polyp is not visible due to purulent exudates. (B) After flushing, a polyp is visible that fills the ear canal.



Fig. 3. In the right ear canal, the polyp was found through video otoscopy. (A) A polyp in the horizontal ear canal. (B) Ruptured tympanic membrane and a remnant of polyp inside the tympanic bulla, after removal of a polyp in horizontal ear canal. (C) A polypoid mass (approximately 2 cm long), horizontal ear canal (white arrow) and polyp in the middle ear (black arrow).

post-PTT with prednisolone treatment. Horner's syndrome followed by removing aural polyp is known to be more likely to occur as a complication in ventral bulla osteotomy than in traction-avulsion (11). One study found that Horner's syndrome occurred after PTT treatment at a rate of 8% (3/37) in cats, which was significantly lower compared to other conventional methods (6). Horner's syndrome is also one of the most complications which can occur after removal of aural polyp, but it is usually self-limited within few months (3,11). Therefore, the possibility of Horner's syndrome should be notified to owners in advance, and even if this symptom occurs, it will be more appropriate to monitor carefully rather than to initiate aggressive treatment.

When polyps are visually identified in the ear canal, there is a high possibility of having otitis media which could be temporary or permanent (4-6). In this case, the presence of polyps in the ear canal passage was visually observed and both otitis externa and media secondary to the inflammatory polyp was confirmed. Three weeks after polyp removal with antibiotics therapy, cytology of ear discharge showed *Malassezia* spp. and neutrophils and bacteria were not identified, which were previously observed in cytology. Moreover, the amount of ear discharge significantly decreased. Although the cat of this case belongs to the poor stage in the progno-

sis evaluation according to symptoms (6), clinical manifestation showed improvement during 6-week follow-up period after polyp removal.

Feline otitis is usually multifactorial and otitis media is frequently related to an inflammatory polyp (3,5). Thus, it is important to diagnose the primary cause and treat appropriately according to the cause in cats with ear discharge.

In conclusion, this case report describes the endoscopic diagnosis and clinical management of aural inflammatory polyp concurrent with otitis media in a cat. In addition, CT scan is effective in identifying the margin of polyps and the presence of polyp remnant. Moreover, PTT technique might be effective and non-invasive technique for treating inflammatory polyp compared to surgical and other endoscopic techniques.

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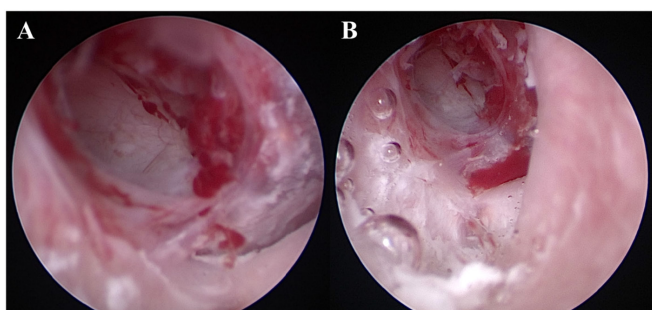


Fig. 4. Video otoscopic examination after per-endoscopic trans-tympanic traction of the polyp. (A) Mild bleeding inside middle ear. (B) Tympanic membrane with tear in the pars tensa.

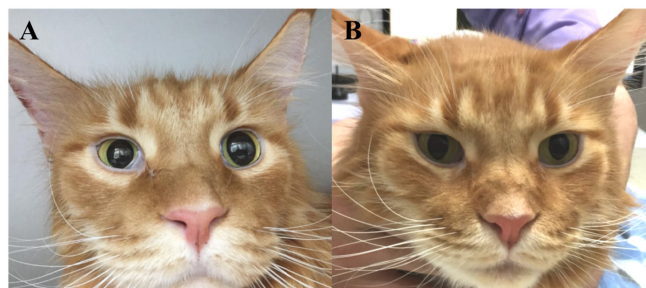


Fig. 5. (A) Horner's syndrome was observed in the right eye, after removal of the polyp. (B) Horner's syndrome in the right eye spontaneously recovered after a week.

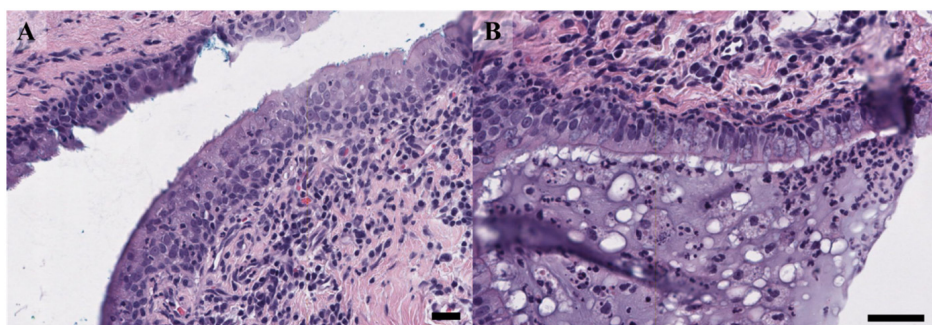


Fig. 6. Histologically, polyp diagnosed as inflammatory polyp with a fibrovascular stroma. (A) Plasma cells, lymphocytes and neutrophils are present, and no microorganisms or viral inclusions are identified. H & E stain; Bar = 20 μ m. (B) The surface of the polyp is lined by pseudostratified ciliated columnar cells. There are glands within the stroma, which multifocally have luminal neutrophils. H & E stain; Bar = 25 μ m.

Conflicts of Interest

The authors have no conflicting interests.

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