

SURGICAL APPROACH TO TOTAL EAR CANAL ABLATION IN A CANINE PATIENT: A CASE REPORT

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Abstract

Chronic, refractory otitis externa in dogs may progress to irreversible changes in the ear canal, rendering clinical treatment insufficient and indicating total ear canal ablation with bulla osteotomy (TECA-BO). This study aimed to report a case of TECA-BO in a dog with recurrent chronic otitis, describing the clinical and diagnostic findings, surgical approach, and postoperative course. An 11-year-old neutered male German Spitz was evaluated with a history of recurrent otitis of approximately 14 months' duration and no satisfactory response to various clinical treatments. Physical examination revealed swelling and discharge in the ear canal, associated with marked discomfort in the head region. Computed tomography showed irregular thickening and mineralization of the walls of the vertical and horizontal canals, as well as intraluminal material and changes in the tympanic bulla, consistent with advanced chronic otitis externa. Given the extent and irreversibility of the lesions, TECA-BO was performed. The patient underwent general anesthesia, with acepromazine and methadone as preanesthetic medication, induction with propofol, maintenance with sevoflurane, and an auriculotemporal nerve block with lidocaine. During the procedure, the entire ear canal was removed and osteotomy of the tympanic bulla was performed, followed by curettage and lavage with warmed saline solution. The postoperative period proceeded without clinically relevant complications, with adequate pain control and maintenance of vital parameters.

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After 14 days, complete healing of the surgical wound and no discomfort upon manipulation were observed. Histopathological examination revealed moderate, diffuse, hyperplastic, polypoid nodular otitis. Despite unilateral hearing loss, the patient showed clinical improvement and an improved quality of life. It is concluded that TECA-BO is an effective surgical alternative in cases of advanced chronic otitis refractory to clinical treatment, particularly when there is extensive involvement of the ear canal and tympanic bulla. Appropriate diagnosis, surgical planning, anesthetic support, and postoperative management are essential for satisfactory outcomes.

Keywords: Chronic otitis externa, Chronic pain, Recurrent otitis, Surgical procedure.

INTRODUCTION

Total ear canal ablation combined with tympanic bulla osteotomy (TECA-BO) is a surgical procedure indicated primarily for the treatment of chronic and irreversible disorders of the external and middle ear, particularly when both the vertical and horizontal portions of the ear canal are affected and the tympanic bulla is involved. Although chronic, refractory otitis externa is an important indication for investigation and surgical treatment, not all cases require TECA-BO. Disorders confined to the vertical canal, such as congenital or inflammatory stenosis and certain polyps, may be adequately treated using more conservative techniques, such as partial or lateral ear canal ablation, also known as the Zepp procedure. Thus, the indication for TECA-BO should take into account the extent and irreversibility of the changes, particularly the presence of thickening, mineralization, and persistent infection involving the horizontal canal and deeper structures, which preclude clinical treatment or less invasive procedures (Cole et al., 2019).

According to Fossum (2019), the primary objectives of TECA are to remove the affected tissues and gain access to the tympanic bulla so that the epithelium and infected material can be eliminated, thereby controlling infection, relieving pain, and improving quality of life. However, the success of the

procedure is directly related to surgical planning, precise knowledge of the regional anatomy, and careful execution of the technique, in addition to appropriate infection control and postoperative management.

Despite its high success rate, TECA-BO may be associated with postoperative complications. Lee et al. (2021) reported facial nerve paralysis as one of the most frequent complications. It may occur transiently in up to 35% of cases, with most patients recovering within two to eight weeks. Other complications include hemorrhage, formation of aural fistulas, and persistent infection of the tympanic bulla, the occurrence of which may be related both to the surgical technique and to the severity and extent of otitis media (Marcellin-Little et al., 2020).

TECA is considered a definitive approach for severe, refractory cases of chronic otitis and has a high success rate when the surgical indication is appropriate and perioperative management is conducted carefully (Bellenger; Boston, 2017). In this context, the use of antibiotics based on bacterial culture and antimicrobial susceptibility testing plays an important role in controlling persistent infections, particularly in cases involving organisms such as *Pseudomonas aeruginosa* and *Staphylococcus pseudintermedius* (Nuttall, 2016).

In addition to clinical and otologic assessment, computed tomography (CT) makes an important contribution to surgical planning by allowing detailed characterization of the ear canal, tympanic bulla, and adjacent structures. The use of this imaging modality can help determine the extent of the lesions and guide the selection of the surgical approach, contributing to more precise planning and potentially reducing complications (Martins; Costa; Oliveira, 2022).

Overall, TECA-BO remains an important therapeutic option for dogs with advanced chronic otitis refractory to clinical treatment, particularly in cases involving the ear canal and tympanic bulla. Although it is a more complex procedure and is associated with a risk of complications, proper execution can provide long-term disease control, pain reduction, and significant improvement in patients' quality of life (Fossum, 2019; Lee et al., 2021).

Accordingly, this report describes a case of TECA-BO in a dog with a prolonged history of recurrent chronic otitis refractory to clinical treatment, detailing the clinical and imaging findings, planning and execution of the surgical technique, anesthetic and postoperative management, and the patient's clinical course. It also seeks to contribute to the veterinary literature by demonstrating the applicability of this surgical approach in cases in which the ear canal changes are extensive and irreversible, affect structures beyond the vertical portion, and render both clinical treatment and more conservative techniques insufficient.

CASE REPORT

An 11-year-old neutered male German Spitz was referred for TECA surgery. The patient had previously undergone clinical evaluation and had a history of recurrent otitis refractory to several prior clinical treatments for more than one year. On physical examination, the dog showed marked discomfort in the head region, and the ear canal exhibited swelling and discharge in the vertical canal. In addition, the patient had a heart rate of 128 bpm, respiratory rate of 24 breaths/min, rectal temperature of 38.2°C, and systolic arterial pressure of 180 mmHg. The mucous membranes were normally colored, and the patient was adequately hydrated.

The complete blood count revealed mild leukocytosis, with a total leukocyte count of 19,000/ μ L, compared with a reference value of up to 17,000/ μ L for the species. Serum biochemical parameters, including ALT, ALP, albumin, creatinine, urea, phosphorus, total calcium, glucose, sodium, and potassium, remained within the reference ranges for the species. Echocardiography revealed age-compatible degeneration of the mitral and tricuspid valves, with no hemodynamic repercussions or need for pharmacological clinical treatment.

Computed tomography with nonionic iodinated contrast revealed contrast-enhancing walls in both the vertical and horizontal portions of the right ear canal, with marked, irregular thickening, foci of mineralization, and dense intraluminal material obstructing airflow (Figure 1).

Figure 1

Computed tomography of the canine skull with nonionic iodinated contrast. Pathological changes are visible in the right ear canal, characterized by contrast-enhancing walls in both the vertical and horizontal portions; marked, irregular thickening of the canal walls; foci of mineralization; and dense intraluminal material causing complete obstruction of airflow. Findings consistent with chronic otitis externa.



Source: Imaginar Diagnóstico Veterinário. Report issued by Maria L. Eichenberg, DVM, MSc, 2025.

Given the history of recurrent chronic otitis, treatment failure, and the changes observed on clinical and imaging examinations, surgical treatment by TECA was selected.

Following preanesthetic assessment, the animal was classified as ASA III according to the American Society of Anesthesiologists. Preanesthetic medication consisted of a combination of acepromazine (0.02 mg/kg) and methadone (0.3 mg/kg), administered intramuscularly (IM). Venous access was subsequently established, and anesthesia was induced with intravenous (IV) propofol. The patient was intubated, and anesthesia was maintained with sevoflurane using a calibrated anesthesia machine. For analgesia, an auriculotemporal nerve block was also performed with 2% lidocaine.

Before the surgical procedure, the right side of the face and the pinna were clipped. With the patient positioned in left lateral recumbency and the head elevated (Figure 2), antisepsis was performed using alcohol and 2% chlorhexidine.

Figure 2

Dog positioned in left lateral recumbency after clipping and antiseptic preparation for surgery.



Source: Personal archive, 2025.

With the animal at stage III, plane 2–3 anesthesia, an appropriate surgical depth, a T-shaped incision was made (Figure 3), with a horizontal incision parallel and ventral to the upper margin of the tragus. From the midpoint of the horizontal incision, a vertical incision was made extending beyond the level of the horizontal ear canal, allowing adequate exposure of the internal structures. Using a scalpel blade, the horizontal incision was continued around the opening of the vertical ear canal, and Mayo scissors were used to dissect the underlying tissues around the proximal and medial portions of the vertical canal. The horizontal canal was dissected to the level of the bony external acoustic meatus, resulting in complete removal of the ear canal and providing access to the tympanic bulla. The bulla was curetted to remove cellular debris, bone spicules, and pathological material. After osteotomy, the bulla was lavaged with warmed saline solution.

Figure 3

T-shaped incision, with a parallel horizontal incision ventral to the upper margin of the tragus.



Source: Personal archive, 2025.

After ablation and bulla osteotomy, closure of the deeper layers was initiated, satisfactorily reducing the dead space, followed by skin closure. During the procedure, 4-0 monofilament absorbable poliglecaprone suture was used to ligate blood vessels and close the subcutaneous tissue. For skin closure, 4-0 monofilament nonabsorbable nylon suture was used.

Conchectomy was not performed during TECA, thereby preserving the integrity of the patient's pinna (Figure 4). Despite right-sided hearing loss, the patient experienced an improved quality of life.

Figure 4

Appearance of the canine patient's ear during the immediate postoperative period.



Source: Personal archive, 2025.

During the first 72 hours after the procedure, the patient showed a favorable clinical course, with controlled pain and vital parameters remaining within the normal ranges for the species, and was discharged from the hospital. During hospitalization, the patient received methadone QID by the subcutaneous route (0.15 mg/kg), clindamycin SID intravenously (10 mg/kg), ondansetron TID intravenously (0.5 mg/kg), maropitant citrate SID intravenously (0.1 mg/kg), dexamethasone SID intravenously (0.25 mg/kg), and lubricating eye drops in the right eye only every two hours.

No complications, such as fistulas or abscesses, were observed in the weeks following the intervention, and no neurological deficits were identified. The surgical specimen was submitted for histopathological analysis, which yielded a diagnosis of moderate, diffuse, hyperplastic, polypoid nodular otitis (Figure 5).

Figure 5

Ear canal specimen containing an obstructive polyp removed during TECA in the canine patient.



Source: Personal archive, 2025.

After 14 days, the patient returned for evaluation of the surgical wound and suture removal. The wound was completely healed, and the patient exhibited no discomfort upon manipulation.

DISCUSSION

Chronic and recurrent otitis externa is a common disorder in small-animal practice and may follow a progressive course, particularly in patients predisposed to ear canal stenosis and with an unsatisfactory response to clinical treatment (Bentley et al., 2020). Small-breed dogs may be more predisposed to the development of chronic stenosis because of the smaller diameter of the ear canal, a condition that promotes cerumen accumulation, persistent inflammation, and progression of structural changes (Kotzias et al., 2020). In the present case, the patient had a history of recurrent otitis for approximately 14 months, associated with a lack of satisfactory response to various clinical treatments.

The progression of chronic inflammation may result in thickening and mineralization of the ear canal walls, as well as proliferative changes and luminal obstruction, hindering the penetration of topical medications and reducing the response to clinical treatment (Harvey, 2016; Diverio et al., 2019). These changes were demonstrated in the present case by computed tomography, which revealed marked,

irregular thickening of the canal walls, foci of mineralization, and intraluminal material causing complete obstruction of the passage. The prolonged clinical course and refractoriness observed are also consistent with studies showing that a substantial proportion of dogs undergoing TECA have a history of chronic disease and prior treatment failure (Kowaleski et al., 2018).

Clinical assessment combined with diagnostic imaging is essential for surgical planning, particularly in advanced cases. Computed tomography enables more precise characterization of the extent of changes in the ear canal and tympanic bulla and allows assessment of adjacent structures, thereby contributing to the determination of the surgical approach (Kim et al., 2018). In the present case, the tomographic findings were decisive in indicating surgical treatment because of the extent of the changes and the involvement of deeper structures.

The decision to combine total ear canal ablation with tympanic bulla osteotomy should take into account the presence or absence of changes in the bulla. Although TECA alone may be indicated in patients without clinical, radiographic, or intraoperative evidence of otitis media and without significant changes in the tympanic bulla, the presence of pathological material and structural changes in this region constitutes an indication for concomitant osteotomy (Watt et al., 2020; Moquet et al., 2021). In the present case, imaging revealed the presence of material and debris in the tympanic bulla, justifying the combined approach.

Removal of the affected tissue and appropriate treatment of the bulla are important for reducing the possibility of persistent secretory tissue and, consequently, postoperative complications. The retention of altered or infected epithelium within the bulla may be associated with the development of draining fistulas and secondary abscesses (Suppa et al., 2017; Fossum et al., 2019). In the patient described in this report, no fistulas or abscesses were observed during follow-up, and the postoperative course was satisfactory. This outcome is favorable, considering that some bulla-related complications may occur during the first weeks after the procedure (Elliott et al., 2021).

TECA is considered a definitive approach for advanced cases of chronic otitis, particularly when clinical treatment does not produce satisfactory results. In addition to controlling the disease, the procedure is associated with reduced pain and improved quality of life (Wong et al., 2022). Although complications such as fistulas and facial nerve neuropathy may occur, studies have reported success rates exceeding 80%, underscoring the importance of proper execution of the technique and postoperative follow-up (Coates et al., 2016). In the present case, no neurological complications or surgical wound-related complications were identified during the follow-up period.

Pain management is another fundamental aspect in these patients, as long-standing chronic otitis may be associated with persistent pain and sensitization of nervous structures, negatively affecting quality of life. The use of a multimodal analgesic approach, as recommended by Grimm et al. (2020), contributes to appropriate pain control during the perioperative period. In the present case, postoperative methadone administration, combined with an intraoperative auriculotemporal locoregional block using lidocaine, contributed to pain control and a favorable clinical course. The improvement observed after the intervention is also consistent with reports of a significant reduction in discomfort and improved quality of life following TECA (Harvey, 2016; Watt et al., 2020).

Histopathological examination revealed moderate, diffuse, hyperplastic, polypoid nodular otitis, a finding consistent with the chronic inflammatory and proliferative process observed clinically and on diagnostic imaging. Proliferative changes of this nature may be associated with the prolonged progression of inflammation and irreversible stenosis of the ear canal (Chung et al., 2020).

Although the intervention resulted in unilateral hearing loss, preservation of the pinna and resolution of the inflammatory process helped improve the patient's comfort and quality of life. Studies indicate that reduced pain and discomfort following ablation may result in significant improvements in the interaction and behavior of animals undergoing the procedure (Smith et al., 2021). Thus, the present case reinforces the importance of an appropriate diagnosis and surgical indication in patients with refractory chronic otitis, particularly before the changes progress to more advanced stages.

CONCLUSION

In the present case, the approach adopted by the surgeon produced an effective and satisfactory outcome through total ear canal ablation, considering the patient's long-standing recurrent chronic otitis refractory to conventional treatments. The surgical decision was supported by the clinical, laboratory, and tomographic findings, including marked thickening of the ear canal walls, mineralization, and complete obstruction of the acoustic meatus.

Although total ear canal ablation results in unilateral hearing loss, the procedure provided a marked improvement in the patient's quality of life by reducing pain, inflammation, and persistent discomfort. This case highlights the importance of early assessment, an appropriate surgical indication, and multidisciplinary management in advanced cases of chronic otitis, offering a favorable prognosis when the procedure is performed with adequate planning, appropriate anesthetic support, and careful postoperative follow-up.

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