

UC Irvine

UC Irvine Previously Published Works

Title

Intratympanic Injection of Autologous Blood for Traumatic Perilymphatic Fistulas

Permalink

<https://escholarship.org/uc/item/9pr8k510>

Journal

Otolaryngology, 141(2)

ISSN

0194-5998

Authors

Garg, Rohit
Djalilian, Hamid Reza

Publication Date

2009-08-01

DOI

10.1016/j.otohns.2009.05.024

Peer reviewed

CLINICAL TECHNIQUES AND TECHNOLOGY

Intratympanic injection of autologous blood for traumatic perilymphatic fistulas

Rohit Garg, MD, MBA, and Hamid Reza Djalilian, MD, Irvine, CA

No sponsorships or competing interests have been disclosed for this article.

Aperilymphatic fistula (PLF) is any abnormal communication between the middle ear or mastoid and the inner ear. Trauma, prior stapes surgery, and barotrauma are accepted etiologies¹; however, controversy exists over the existence of spontaneous PLF. Typical symptoms include fluctuating sensorineural hearing loss, tinnitus, aural fullness, vertigo, and disequilibrium. PLF diagnosis is based on history, complete examination, and a positive fistula test. A positive fistula test is confirmed by the elicitation of nystagmus or a sense of motion.¹

Treatment options include conservative management or surgical treatment depending on the severity and duration of the symptoms. Medical management includes bed rest, head elevation, stool softeners, and avoidance of straining, coughing, or sneezing. Surgical management consists of exploratory tympanotomy and grafting of the oval and round windows. This paper retrospectively analyzes three cases of a novel approach to treatment of traumatic PLFs when medical management had failed.

MATERIALS AND METHODS

From 2006 to 2008, a retrospective review of cases was performed of a single neurotologist's practice at an academic tertiary center. Approval was obtained from the institutional review board. Three patients with clinical and diagnostic examinations consistent with traumatic PLFs were identified and then underwent intratympanic injection of autologous blood.

The first patient sustained injury to his left ear during a car accident with impaction of his Bluetooth apparatus into his ear 2 weeks prior to presenting to our institution. The patient had an intact tympanic membrane (TM), a strongly positive fistula test, and Tulio phenomenon. He had been on bed rest for 2 weeks prior to presentation without relief. After treatment with intratympanic autologous blood injection (blood patch), the patient's symptoms resolved the next day.

The second patient sustained injury to her left ear during a hard fall while surfing. She had a 6-month trial of bed rest

and presented to us 9 months after the injury. She had Tulio phenomenon and a positive Hennebert sign. Temporal bone CT was performed in this patient to rule out semicircular canal dehiscence; the canal was normal. Despite treatment with a blood patch and subsequent surgical fascial grafting of the round and oval windows, the patient's symptoms persisted. Intraoperatively, there was a bony prominence obscuring the majority of the round window membrane. Attempts at curetting the bony growth failed and drilling it was thought to endanger the round window membrane. A fascial graft was placed around the bony prominence in an attempt to cover the round window.

The last patient sustained injury from a cotton-tipped applicator, which became impacted in her left ear. She sustained a TM perforation in the posterior superior quadrant and had mixed hearing loss with a high frequency sensorineural component. She was suffering from severe vertigo. Because she was 20 weeks pregnant, the patient was given the option of a blood patch procedure in lieu of a procedure under local or general anesthesia. The patient's symptoms improved the next day after treatment with the blood patch procedure.

Procedure

After local anesthesia of the TM with phenol, a control hole was made in the anterosuperior quadrant of the affected ear. Afterwards, 0.5 mL of autologous blood was injected in a separate part of the anterosuperior quadrant with the use of a 25-gauge spinal needle. The patient was then placed in a semirecumbent position to position the blood into the round and oval windows for 20 minutes. In the last patient, the blood was injected through the TM perforation.

Follow-up was performed within 1 week, and at 6 weeks posttreatment of the fistula and audiogram were repeated.

RESULTS

The first and third patient demonstrated resolution of symptoms the next day and a negative fistula test on follow-up. The second patient showed improvement of symptoms but

Received February 27, 2009; revised May 8, 2009; accepted May 19, 2009.

Table 1
Patient description and outcomes

Patient	Age	Side	Sex	Etiology	Outcome
1	37	Left	Male	Bluetooth headset impaction trauma	Resolution of symptoms
2	36	Left	Female	Surfing accident	Improvement of symptoms, but no resolution
3	32	Left	Female	Cotton-tipped applicator trauma	Resolution of symptoms

not complete resolution. She consequently required exploratory tympanotomy with tissue grafting of the oval and round windows twice. Despite surgical management, the patient continued to exhibit Tulio phenomenon (Table 1).

DISCUSSION

The use of autologous blood as a patch or seal is not a new phenomenon. In his stapedectomy description, House² described using blood around the prosthesis to form a seal. Shinohara et al³ performed an experimental study on guinea pigs using autologous blood to repair artificially created ruptures of the round window with success in seven of 11 cases. The authors theorized that initially blood covers the round and oval windows and seals them mechanically. After a few days, blood creates an inflammatory reaction that may facilitate granulation tissue formation and adhesion of adjacent tissues.

Traditionally, the treatment of PLFs has been by surgical repair using fascia. Surgical repair can result in improvement of vestibular symptoms and hearing loss, and prevention of potential meningitis; however, there is significant cost and some risk involved. Intratympanic injection of autologous blood is a feasible and inexpensive intermediate option before surgical therapy. This treatment modality may theoretically be more efficacious in an acute rather than a chronic PLF as seen in our cases. This study shows improved outcomes in two of three cases (95% confidence interval, 13%-99%); however, the small study size and lack of a control group preclude generalizing these results. Additional research with a larger sample size and a control group is needed to substantiate the efficacy of the treatment option.

CONCLUSION

This retrospective case analysis demonstrates a novel treatment approach in patients presenting with PLFs who fail

conservative medical management. This method is easily performed, has a low cost, and is quick. Surgery was avoided in two of the three cases presented.

AUTHOR INFORMATION

From the Division of Otolaryngology, Neurotology and Skull Base Surgery, Department of Otolaryngology–Head and Neck Surgery, University of California, Irvine Medical Center, Orange, CA 92868.

Corresponding author: Hamid R. Djalilian, MD, Director, Division of Otolaryngology, Neurotology and Skull Base Surgery, Department of Otolaryngology–Head and Neck Surgery, University of California, Irvine Medical Center, 101 The City Drive South, Bldg 56, Ste 500, Orange, CA 92868.

E-mail address: hdjalili@uci.edu.

Presented at the Western Section Meeting of the American Laryngological, Rhinological and Otolaryngological Society, Las Vegas, Nevada, January 29-31, 2009.

AUTHOR CONTRIBUTIONS

Rohit Garg, development of database, data acquisition and analysis, drafting and revision of manuscript, approval of final manuscript; **Hamid Reza Djalilian**, study concept, data acquisition, revision of manuscript, approval of final manuscript.

DISCLOSURES

Competing interests: None.

Sponsorships: None.

REFERENCES

1. Bhansali SA. Perilymph fistula. *Ear Nose Throat J* 1989;68:11, 14–6, 21–8.
2. House JW. Stapedectomy technique. *Otolaryngol Clin N Am* 1993;26: 389–93.
3. Shinohara T, Gyo K, Murakami S, et al. Blood patch therapy of the perilymphatic fistulas: an experimental study. *Nippon Jibiinkoka Gakkai Kaiho* 1996;99:1104–9.