HOW DO I MANAGE

Intraoperative Marking of Overlay Graft: A Simple Technique to Pass a Malleus through a Hole

Dong-Hee Lee, Heung-Youp Lee, Jae-Hyun Seo, Hyeog-Gi Choi

Department of Otolaryngology-Head and Neck Surgery, College of Medicine, The Catholic University of Korea, Seoul, Korea

Correspondent Author:
Dr. Dong-Hee, Lee,
Department of Otolaryngology-Head and Neck Surgery,
Uijeongbu St. Mary's Hospital, The Catholic University of Korea,
#65-1 Geumo-Dong, Uijeongbu City, Gyeonggi-Do, 480-717, Korea.

Tel : 82-31-820-3564
Fax : 82-31-847-0038
E-mail : leedh0814@catholic.ac.kr

Submitted: June 3, 2008
Revised: July 24, 2008
Accepted: September 14, 2008

Mediterr J Otol 2008; 217-220

OBJECTIVES: To prevent lateralization of the graft, one of the most serious complications of myringoplasty or tympanoplasty, it is very important to place a graft medial to the malleal handle or to exteriorize a part or total handle of the malleus. In the grafting technique for which a part of the malleal handle is exteriorized by making it pass through a hole created in the fascia graft, it is the key point to clearly identify the hole made on the temporalis fascia and to quickly pass the malleal handle through a hole. Now we present here a simple surgical tip to identify the hole easily and facilitate passing the malleal handle through it.

SETTING: Retrospective review; university-based hospital.

SUBJECTS: Sixty-seven cases of overlay myringoplasty or tympanoplasty.

RESULTS: Because our technique can allow the surgeon to better see the hole and to better handle the graft, it is useful regardless of the experience of the surgeon. In addition, any adverse effect of gentian violet has not reported in our cases.

CONCLUSION: Our technique allows the clear identification of a hole on the temporalis fascia and helps the malleal handle pass much easier through a hole. Such improved identification of a hole can be very helpful for trainee residents or less-experienced surgeons.

The two classic methods for graft placement are the underlay (medial) and overlay (onlay or lateral) techniques. Because the graft is placed laterally to the annulus in the overlay technique, it is very important to prevent lateralization of a graft.

Lateralization of the TM is one of the most serious complications of myringoplasty or tympanoplasty. This is a condition in which the TM does not contact with the conducting mechanism of the middle ear, which may result in a considerable loss of hearing. Many grafting techniques have been used to avoid lateralization of the graft.[1-3] One of the grafting techniques used in myringoplasty or Wullstein's type I tympanoplasty is to place a graft medial to the malleal handle or to exteriorize a part or total handle of the malleus.

Since three years ago, we have used a grafting technique for which a tip of the malleal handle is anchored to a fascia graft to avoid lateralization of the neodrum in cases of the overlay myringoplasty or tympanoplasty. One of the key points in this grafting technique is to identify the hole on the temporalis fascia and to pass the malleal handle through a hole. The need to clearly identify the hole on the temporalis fascia is technically challenging for residents or less-experienced surgeons. We present here a simple grafting technique to easily identify the hole on the temporalis fascia and facilitate passing the malleal handle through a hole. Such improved identification of a hole can reduce the time of a graft placement and it can substantially decrease the failure rate of the grafting.

TECHNIQUE

This technique is for the cases of the overlay grafting that the graft is placed laterally to the annulus.

Transcanal or postauricular approaches are used, depending on the clinical situation. The graft material is obtained at the beginning of the procedure; the superficial or deep temporalis fascia is harvested, spread on the cutting block, pressed by the slide glasses, and air dried under the surgical light.

All procedures of the tympanomastoidectomy are finished, and the middle ear cavity is packed with gelfoam soaked in nonototoxic fluoroquinolone antibiotic otic drops before the grafting procedure. Unlike in the underlay grafting technique, the middle ear packing does not have to be tight.

The dried temporalis fascia is trimmed to be proper size, and a 2 mm-sized hole is made in it by a #11 knife smeared with gentian violet (Figure 1). Thereafter, the temporalis fascia is grafted laterally over the annulus. To avoid lateralization of the graft, the tip of the malleal handle is put through a hole on the fascia graft (Figure 2). After the elevated canal skin is replaced, gelfoam packings are placed into the ear canal.

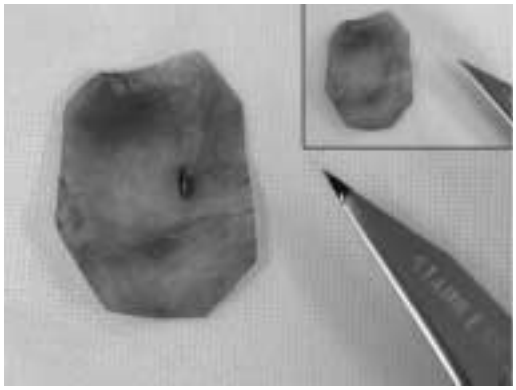

Figure-1: A 2 mm-sized hole is made by a #11 knife that's smeared with gentian violet. Only a tiny amount of gentian violet that's smeared on the tip of a #11 knife is enough for the color contrast to make a hole easier to identify. It presents the remarkable contrast to the same hole that is made only by #11 knife (right upper inset).

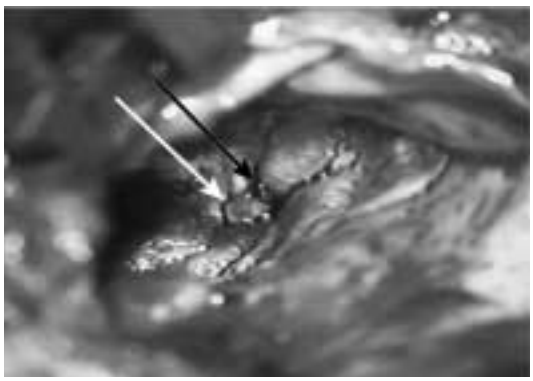

Figure-2: When the temporalis fascia is grafted in the overlay manner, a fascia graft is anchored to a tip of the malleal handle (white arrow) by making it pass through a hole created in the fascia graft. Gentian violet presents the color contrast a stained hole (black arrow) with other portion of a fascia.

DISCUSSION

Since three years ago, we have used this technique in all the overlay graft tympanomastoidectomies, except for underlay graft ones and canal wall down ones. To evaluate any adverse effects of our technique, medical records of 67 patients who underwent this technique were reviewed retrospectively. But no inner ear dysfunction or allergic reaction that could be attributed to gentian violet was documented. If the ear canal packing is removed within 1-2 weeks postoperatively, then the gentian violet is visible. However, in most cases for which the ear canal packing melted away 4 weeks postoperatively, gentian violet was not seen. There was no case for which gentian violet discoloration persisted for a long time.

The advantages of the overlay technique include wide exposure and the ability to use it for all size of perforation. Its main disadvantage is a more technically demanding and difficult-to-master procedure for the occasional ear surgeon.[4-9]

Some authors reported that the prognostic factors influencing the success rate of myringoplasty are technical, including the surgical approach, the operative field and the skills of the surgeons; for example, the worse results obtained after the transmeatal approach are consequent to the more difficult positioning of the graft through this narrower operative field. Therefore, it is very important to position the graft in the proper position by allowing the surgeon to better see the operative field and more easily inspect the hole, and for better handling the graft.[10]

We present here a simple technique for surgeons to easily identify the hole on the temporalis fascia, and a stained graft makes it much easier to pass the malleal handle through a hole in the overlay myringoplasty or tympanoplasty. The initial motivation for developing this technique was for helping a less-experienced author (Lee DH) to better see the hole and to reduce the time of graft placement. However, it became clear that this technique is easy and useful regardless of the experience of the surgeon.

Gentian violet (hexamethyl pararosaniline chloride) is an antifungal agent that has been used to treat otomycosis for more than 60 years, as well as it is the primary agent used for the Gram stain test. In addition, it is the main component of many surgical marking pens. Tom warned that gentian violet was toxic at high concentrations in an animal study, yet no in vivo ototoxicity has been reported.[11] Although there is no direct evidence of its safety with respect to the middle or inner ear in our cases, we have experienced no adverse effects from our technique. Nevertheless we recommend using a minimum amount of gentian violet. Judging from our experiences, a tiny amount of gentian violet that's smeared on a tip of a #11 knife is enough for the color contrast to make a hole easier to identify. Of course, this can reduce the possible ototoxicity of gentian violet against a middle or inner ear.

REFERENCES

1. El-Kashlan HK, Harker LA. Tympanoplasty and ossiculoplasty. In: Cummings CW, Haughey BH, Thomas JR, Harker LA, Flint PW, eds. Cummings Otolaryngology: Head and Neck Surgery. 4th ed. Philadelphia: Elsevier Mosby; 2005. p. 3065-3068.
2. Sanna M, Sunose H, Mancini F, Russo A. Middle Ear and Mastoid Microsurgery. Stuttgart_New York: Georg Thieme Verlag; 2003. p. 114-115.
3. Sheehy JL. Surgery of chronic otitis media. In: English GM, ed. Otolaryngology. Philadelphia: Lippincott; 1991. p. 22-24.
4. Rizer FM. Overlay versus underlay tympanoplasty. Part I: historical review of the literature. Laryngoscope 1997; 107(12 Pt 2): 1-25.
5. Rizer FM. Overlay versus underlay tympanoplasty. Part II: the study. Laryngoscope 1997; 107(12 Pt 2): 26-36.

6. Wehrs RE. Grafting techniques. Otolaryngol Clin North Am 1999; 32: 443-455.
7. Kartush JM, Michaelides EM, Becvarovski Z, LaRouere MJ. Over-under tympanoplasty. Laryngoscope 2002; 112: 802-807.
8. Schraff S, Dash N, Strasnick B. "Window shade" tympanoplasty for anterior marginal perforations. Laryngoscope 2005; 115: 1655-1659.
9. Jung TT, Park SK. Mediolateral graft tympanoplasty for anterior or subtotal tympanic membrane perforation. Otolaryngol Head Neck Surg 2005; 132: 532-536.
10. Albera R, Ferrero V, Lacilla M, Canale A. Tympanic reperforation in myringoplasty: evaluation of prognostic factors. Ann Otol Rhinol Laryngol 2006; 115: 875-879.
11. Tom LW. Ototoxicity of common topical antimycotic preparations. Laryngoscope 2000; 110: 509-516.