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EDITORIAL

The role of different types of grafts in tympanoplasty[☆]



O papel dos diferentes tipos de enxertos nas timpanoplastias

In 1878, Emil Berthold was the first to describe the surgical procedure of myringoplasty, using a free skin graft from the forearm,¹ although Edward Ely argued in a later publication that he had been the pioneer in this procedure.² But it was only in the 1950s that tympanoplasty-related articles reappeared in the literature. The fundamental principles of the surgical procedure were described by Wullstein³ in 1952, using a free skin graft, and Zoellner⁴ in 1955, using a pedicle graft.

Since then, several types of materials have been used to reconstruct the tympanic membrane. Among the autologous grafts, the following can be mentioned: temporalis fascia, fascia lata, periosteum, perichondrium, cartilage with and without perichondrium, veins, fatty tissue, and skin.^{5,6} Several allografts are mentioned in the literature and include: dura mater, pericardium, temporalis fascia, amniotic membrane, skin, cornea, peritoneum, veins, and aortic valve.⁶ Recently, alloplastic grafts such as paper, absorbable gelatin sponge, and acellular dermal matrix have also been used.⁷

The trend toward increasingly less invasive medical procedures, with shorter hospitalization stay, has led to a demand for materials to replace autologous grafts. Theoretical advantages include the elimination of morbidity related to graft harvesting, faster healing, no visible scarring, less pain, and less risk of infection, in addition to a faster procedure and early discharge. These grafts, however, make the procedure more expensive and have shown no real advantages so far.⁷

The fascia temporalis is the most commonly used graft, with success rates between 93% and 97% in primary tympanoplasty, especially in well-aerated middle ears.^{5,8} In the last decade, however, there has been an increasing interest in using cartilage grafts as the primary alternative to its use. The stiffness and strength of cartilage confer greater stability to the graft and have a key role in the resistance against shrinkage. There is some concern, however, that

these same characteristics may have a negative effect on sound conduction.^{5,8}

Lee et al.,⁸ in a retrospective analysis of 40 patients with chronic otitis media and granulation tissue in the middle ear, compared the anatomical and audiological results of type I tympanoplasty using fascia temporalis, cartilage tissue, and cartilage palisade. No statistically significant differences were observed between the three groups regarding the closure of tympanic membrane perforations. Regarding auditory improvement, the cartilage palisade technique showed slightly poorer results than the others. As for the cartilage harvest site, Zahnert et al.,⁹ in an experimental study, concluded that both the conchal and the tragal cartilage had the same effects regarding the auditory properties and the thickness of 0.5 mm was considered sufficient to maintain shrinkage resistance characteristics and sound conduction comparable to a normal tympanic membrane.

In a systematic literature review (recommendation grade A), Mohamad et al.⁵ found that tympanoplasty using fascia temporalis and cartilage grafts showed similar and comparable functional outcomes (hearing improvement). However, there are evidence levels 1, 3, and 4 that show better morphological findings (intact tympanic membrane) with the use of cartilage grafts, with or without perichondrium. The use of cartilage grafts was shown to be a safe option for tympanic membrane reconstruction, both in adults and in children, according to the same study.

The possibility of infectious disease transmission and the cost of synthetic materials maintain autologous grafts as the preferred type by most otologists when performing a tympanoplasty. The cost factor becomes even more important when taking into account the higher prevalence of chronic suppurative otitis in populations of lower socioeconomic level, who are assisted by the public health system. Finally, another key factor is the surgeon's experience. Good results cannot be expected when the physician is not familiar with the surgical technique to be employed.

Conflicts of interest

The authors declare no conflicts of interest.

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