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Results of Using Cigarette Paper to Treat Perforation of the Tympanic Membrane

Timpanik Membranın Perforasyonunu Tedavi Etmek İçin Sigara Kağıdı Kullanma Sonuçları

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ABSTRACT

Objective: The aim of our study was to evaluate the results of cigar paper patch grafting in acute tympanic membrane (TM) perforation.

Materials and Methods: This wasa retrospective study of 23 (success group, 20 cases; failure group, 3 cases) patients who underwent paper patch myringoplasty in an outpatient setting. Data on sex, age, perforation time, hearing loss, andthe size of perforation were evaluated.

Results: The total success rate of paper patch vaccination was 87%, and the fail of success was 13%. This failure was caused by infection in two cases, whereas in one patient, the recurrence and perforation diameter was 3 mm.

Conclusion: This application method is concluded to be a safe, practical method because of its low morbidity, low cost, and easy feasibility. In small, dry acute TM perforations, prior to formal surgery myringoplasty, cigarette paper graft may also be considered.

Keywords: Cigarette paper, tympanic membrane perforation, myringoplasty

ÖZ

Amaç: Çalışmamızın amacı, akut timpanik membran perforasyonunda sigara kağıdı kulanım sonuçlarını değerlendirmektir.

Gereç ve Yöntem: Bu çalışma sigara kağıt yama myringoplasti yapılan 23 hastanın retrospektif bir çalışmasıdır. (başarı grubu, 20 vaka, başarısızlık grubu, 3 vaka). Hastalarımız; cinsiyet, yaş, perforasyon süresi, işitme kaybı ve perforasyon büyüklüğü değerlendirildi.

Bulgular: Sigara kağıt yama uygulamasında başarı oranı %87 iken başarısızlık oranı ise %13 idi. Başarsız vakalarımızın; iki olguda enfeksiyon neden olurken, hastalardan birinde nüks ve perforasyon çapı; 3 mm idi.

Sonuç: Bu uygulama yöntemi; Düşük morbiditesi, düşük maliyeti ve kolay uygulanabilirliği nedeniyle güvenli ve pratik bir yöntem olduğu sonucuna varılmıştır. Küçük, kuru Akut timpanik membran perforasyonlarında, formal cerrahi myringoplasti öncesinde sigara kağıt grefti de düşünülebilir. Anahtar Sözcükler: sigara kağıdı, timpanikmembranperforasyonu, myringoplasti.

Anahtar Kelimeler: Sigara kağıdı, timpanikmembranperforasyonu, myringoplasti

INTRODUCTION

Although perforation of the tympanic membrane (TM) is a frequently encountered clinical condition in humans, its true incidence remains unknown. While the estimated global incidence has been reported as <1%, this rate is likely an underestimate. Perforation is primarily due to an infection, but may also result from traumatic injury. The vast majority of cases of tympanic membrane perforation (TMP) occur through penetrating injury or blunt trauma, abrupt alterations in pressure (i.e., barotrauma), high acoustic energy insult, or through otitis media or several similar causes (1). In our study, only cases of acute traumatic TMP were evaluated. The causes of acute traumatic TMP may be categorized as impactin jury, pene-

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trating trauma, barotrauma, acoustic trauma, iatrogenic traumatic injury secondary to myringotomy, grommet insertion, clearance of wax from the ear canal, earlavage, and hyperbaric oxygen therapy (1).

The first successful surgical intervention involving the eardrum was in 1878, when Berthold performed a "myringoplasty" (as it was termed), using a full thickness skin grafting technique (2-4). Minor traumatic lesions that occur within the eardrum typically resolve spontaneously. Nonetheless, in certain situations, the perforation will remain unclosed or will only be covered over with a thinned section of membrane. In addition, several factors may delay or inhibit recovery and result in chronic perforation. Multiple methods to permit closure of the TMP have been attempted. Kartush (5) has developed a tympanic patch made of flexible silicone material resembling a closed myringotomy tube that can be used for closure of TMP.

The use of paper patches in an outpatient setting has been a widely used technique for many decades. Several studies have demonstrated that paper patches can be used to promote the healing of perforated TMs while avoiding a formal surgical procedure (6, 7). The size of TM perforation has been reported as the prognostic indicator for successful patch myringoplasty. Golz et al. (6) evaluated only chronic perforations >1 year regardless of the cause and followed up the cases until 18 weeks; they recommended paper patching as the first treatment option for TM perforations <5 mm. Lee et al. (8) evaluated only chronic otitis media and followed up the cases through five trials of paper patching; they reported that TM perforations <4 mm have significantly higher closure rates. However, these two studies did not include other clinical factors apart from the size of TM perforations as outcome predictors. Park et al. (9) reported that the outcome predictor of paper patch myringoplasty is perforation size; however, they evaluated only chronic perforations >3 months regardless of the cause and followed up the cases until 3 months.

The objective of the present study was to provide a practical method of treating patients with TMP secondary to acute traumatic injury in such a way as to allow recovery in a short period and without the need for a major surgical operation while also preventing patients losing working hours.

MATERIALS and METHODS

A total of 23 cases of individuals presenting to our clinic with acute perforation of the TM were evaluated retrospectively. A history of trauma was carefully established. All the patients underwent an examination of the head and neck regions, after which the TMP was evaluated by means of otoscopy and audiometric testing. When the perforation was <3 mm in extent, it was categorized as a small perforation. A perforation >3 mm was classified as a large perforation. All the cases in our sample had presented within 10 days of receiving the injury and had been operated on within that period. The operating microscope was used for surgical intervention. Local anesthesia was supplied. Following preparation of the edges of the perforated area, a paper patch myringoplasty can be performed (10). In a similar fashion, we trimmed a cigarette paper to fit over the perforation of the TM and placed a patch of suitable diameter in the affected area. Our study was prepared in accordance with the Declaration of Helsinki.

RESULTS

A total of 23 patients aged between 15 and 40 years participated in the trial. The average age of the patients was 28 years. Of the 23 patients, 13 (56.5%) were male and 10 (43.5%) female. Of the cases, 14 (61%) involved TMP of the left ear, and the remaining 9 (39%) were right-sided. Of the cases included in the trial, 20 (87%) were observed to have an anatomical or functional improvement following surgery. Three out of 23 cases did not result in success. In unsuccessful cases, two had an ear infection and one had a recurrence and a TMP >3 mm in diameter.

DISCUSSION

According to the literature, 88% of cases of TMP recover spontaneously. However, it has been reported that cases left to recover by the natural method have delayed recovery due to the risk of infection (11, 12). We obtained a success rate of 87% in acute TMP cases treated using cigarette paper.

In the study by Imamoğlu et al. (13), examining the rate of recovery in small perforations, 94.7% recovered when the fat plug method was employed, and 94.4% recovered when paper patching was selected. Similar rates were found for larger perforations. In their study, neither the paper patch nor the fat plug technique was found to be effective for larger gaps. In our trial, we found comparable success rates when cigarette paper was used and also a comparable failure rate in larger perforations.

In the study by Hanege et al. (14), despite the rate of perforation closure (95.2%) in patients with paper patch being higher than the rate of closure (81.6%) in untreated patients, the result was not statistically significant.

Lee et al. (15) performed a retrospective study on 114 cases undergoing paper patch myringoplasty and had a success rate of 72.8%. The success rate reported by Lee et al. (15) is lower than the one we found. Such a difference may be explained by the different average ages of the cases in the group examined by Lee et al. (15) and by the high rate of eardrum infections in that group.

In conclusion, the rate of success obtainable using cigarette paper is considerable, regardless of age and whether in children or adults, particularly in cases where the perforation is small and the ear is dry. We think that this treatment method has the advantages of being associated with low morbidity, reasonable cost, feasibility, and is a reliable and practicable method.

Ethics Committee Approval: Due to the retrospective design of the study, ethics committee approval was not obtained. Authors declared that the research was conducted according to the principles of the World Medical Association Declaration of Helsinki "Ethical Principles for Medical Research Involving Human Subjects", (amended in October 2013).

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