Original Article* / *Çalışma - Araştırma

Ear protrusion after tympanoplasty and the use of mastoid dressing

Timpanoplasti sonrası kulağın protüzyonu ve mastoid sargı kullanımı

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Objectives: This study aims to assess possible wound complications of tympanoplasty and tympanomastoidectomy with or without postoperative mastoid dressing.

Patients and Methods: A total of 37 patients (22 females, 15 males; mean age: 23.88 years; range 9 to 64 years) who underwent middle ear or mastoid operations via postauricular incision were included in this prospective, randomized, controlled study. The patients were divided into two groups as having mastoid dressing (n=17) and nonmastoid dressing (n=20). Through a close follow-up, postoperative complications were noted and distance from mastoid scalp and auricular rim was measured.

Results: The mean mastoid-helix distance of non-mastoid dressing group was found 17.2 mm in operated and 16.9 mm in non-operated ears. The mean mastoid-helix distance of mastoid dressing group was 15.53 mm in operated ears and 16.47 mm in non-operated ears. Skin erythema was seen in a patient. There was no statistically significant increase in mastoid-helix distance ($p>0.05$).

Conclusion: Tympanoplasty with or without mastoidectomy does not cause postoperative complication or protrusion of the ear, even if no mastoid dressing is used. Our study results suggest no benefit of mastoid dressing after tympanoplasty with or without mastoidectomy.

Key Words: Bandage; complication; ear deformity; mastoid; tympanoplasty.

Amaç: Bu çalışmada ameliyat sonrası mastoid sargılı ve sargısız timpanoplasti ve timpanomastoidektominin olası yara yeri komplikasyonları değerlendirildi.

Hastalar ve Yöntemler: Bu prospektif, randomize kontrollü çalışmaya postauriküler insizyon ile orta kulak veya mastoid cerrahisi yapılan toplam 37 hasta (22 kadın, 15 erkek; ort. yaş: 23.88 yıl; dağılım 9-64 yıl) alındı. Hastalar mastoid sargılı (n=17) ve mastoid sargısız (n=20) olmak üzere iki gruba ayrıldı. Yakın takip ile ameliyat sonrası komplikasyonlar kaydedildi ve mastoid kafa derisi ile auriküler rim arasındaki mesafe ölçüldü.

Bulgular: Mastoid sargısız grubun ortalama mastoid heliks mesafesi ameliyat edilen kulaklarda 17.2 mm, ameliyat edilmeyen kulaklarda 16.9 mm olarak bulundu. Mastoid sargılı grubun ortalama mastoid heliks mesafesi ameliyat edilen kulaklarda 15.53 mm ve ameliyat edilmeyen kulaklarda 16.47 mm idi. Yalnızca bir hastada ciltte eritem görüldü. Mastoid-heliks arası mesafede istatistiksel olarak anlamlı bir artış bulunmadı ($p>0.05$).

Sonuç: Mastoidektomili veya mastoidektomisiz timpanoplasti mastoid sargı kullanılmasa da, ameliyat sonrası komplikasyona veya kulağın protrüzyonuna yol açmamaktadır. Çalışma bulgularımız mastoid sargının mastoidektomili veya mastoidektomisiz timpanoplasti sonrası herhangi bir yararı olmadığını göstermektedir.

Anahtar Sözcükler: Sargı; komplikasyon; kulak deformitesi; mastoid; timpanoplasti.

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Mastoid dressing is a compressive bandage that is used for auricle, middle ear and mastoid surgeries. Mastoid dressing is assumed to prevent the potential dead space that may cause hematoma or seroma formation. However, studies showed no difference in the incidence of hematoma formation in patients with and without pressure dressing after middle ear surgery or otoplasty, but more wound complications in those with pressure dressings.[1,2] Mastoid bandage is used as traditional postoperative dressing technique and many surgeons were afraid of protrusion of auricle and hematoma formation if they do not use this compressive bandage. But it is a disputable issue that should be investigated. The aim of this study was to assess the need of pressure dressings after ear surgery.

PATIENTS AND METHODS

Sixty-four patients who had middle ear or mastoid operations via postauricular incision were included in the study. Patients were allocated to the mastoid dressing group and no-mastoid dressing group. The patients who had abnormal blood tests, bleeding disorders or former otologic surgery were excluded from the study. Evaluations and measurements could be completed in 37 patients (22 females and 15 males). Of the 37 patients, 17 (10 females and 7 males; mean age 23.88 years; range 9 to 64 years) were in the mastoid dressing group and 20 (12 females and 8 males; mean age 31.2 years; range 12 to 66 years) were in the no-mastoid dressing group. All surgeries were performed by senior surgeons using a postauricular approach. Subcutaneous absorbable sutures (polyglactin 910) and cutaneous non-absorbable sutures (polypropylene) were used for closure of incisions.

A circumferential head bandage with large gauze swabs over the auricle that applied pressure on the surgical area was used as mastoid dressing. The patients who did not have a mastoid dressing were simply dressed with gauze swabs kept in place with adhesive tapes, without compression. All patients had postoperative oral antibiotic treatment (1 gr amoxicillin clavulanic acid daily) for two weeks. The dressings were renewed after two or three days and removed after one week, together with the postauricular sutures. Major and minor complications were recorded in the follow-up period.

The mastoid-helix measurement was done three months after the surgery. The distance from the mastoid scalp to the helix rim at the most posterior level of the upper auricular rim was measured using a plastic caliper compass on both the operated and non-operated ears (Figure 1). The position of the patient's head was parallel to the ground while the measurements were done.

Statistical analysis was performed using the SPSS version 9.05 for Windows software program (SPSS Inc., Chicago, IL, USA). The normal distribution of the groups were detected by Kolmogorov-Simirnov test; the equality of variances in compared groups were analyzed by Levene test. Differences between ears were evaluated using the Student's t-test (paired samples t-test for paired data and independent t-test for unpaired data). Significance level was set at $p<0.05$.

RESULTS

There was no statistically significant difference between ages of two groups ($p>0.05$). Eight of seventeen patients in the mastoid dressing group underwent tympanoplasty with mastoidectomy, eight underwent tympanoplasty without mastoidectomy and one patient underwent mastoidectomy without tympanoplasty. Seven of twenty patients in the no-mastoid dressing group underwent tympanoplasty with mastoidectomy, twelve underwent tympanoplasty without mastoidectomy and one patient underwent mastoidectomy without tympanoplasty.

Figure 1. *Measurement method of distance from mastoid scalp to helix with caliper compass.*

Figure 2. *Skin erythema that was caused by tight mastoid dressing.*

Tragal cartilage was used in six mastoid dressing patients and temporal fascia was used in 11 patients. In the no-mastoid dressing group tragal cartilage was used in 18 patients and temporal fascia was used in one patient.

In the mastoid dressing group, one patient had a minor skin lesion (Figure 2). None of the patients in the no-mastoid dressing group had any minor or major complication.

There was no statistically significant difference between the mastoid dressing group and no-mastoid dressing group in mastoid to helix distance of the operated ears of the patients (Table 1). We did not find any significant difference for the measured distance between operated and non-operated ears of mastoid and no-mastoid dressing groups (Table 2). Presence or absence of mastoidectomy did not change the results (Table 3).

Table 1. Comparison of mastoid-helix distances of mastoid dressing and no-mastoid dressing groups

Mastoid dressing group (n=17)	No-mastoid dressing group (n=20)	*p*
Mean±SD (mm)	Mean±SD (mm)	
15.53±4.3	17.20±2.9	>0.05

SD: Standard deviation.

DISCUSSION

In this study it was shown with an objective parameter that mastoid dressing is not necessary for tympanoplasty operations. Few past studies focused on possible complications of tympanoplasty such as infection, hematoma, seroma or inappropriate wound healing lesions. They compared complication rates of mastoid dressing and no mastoid dressing groups statistically and made a conclusion depending on complication rates. But no objective measurement parameter was used in these studies. Rowe-Jones et al.[1] compared the complication rates and found no difference in the incidence of hematoma formation in patients with and without pressure dressing after middle ear surgery, but more wound complications in those with pressure dressings.[1] Castelli et al.[3] found statistically significant bruising and erythema incidence in mastoid dressing group and concluded to abandon mastoid pressure dressing in non-complicated ear surgeries. There was no major complication in both mastoid and no-mastoid dressing groups, however there was only one minor complication in the mastoid dressing group in the current study.

The main reason for treating a patient with postoperative pressure dressing is often to avoid hematoma and seroma formation.[3] Formation of hematoma or seroma may cause inappropriate wound healing that may result in protrusion of the ear. It might be a dogma but many surgeons are anxious about protrusion of the ear if they do not use mastoid dressing. An objective way to evaluate the protrusion of the ear was to measure the height from helix to mastoid.[4] In our study the distances were measured with a standard method and no statistically significant change was found between two groups. The patients' operated ears were also compared with their non-operated ears and no significant difference was found.

More complications rates but fewer advantages were reported for head dressing and bandages in the literature. Bandages were blamed for causing collection of blood or mucus, and these changes the environment under a head dressing that may promote bacterial proliferation.[5] No such infection was encountered in our study. Luo et al.[6] found it unnecessary to use mastoid dressing

Table 2. Comparison of operated and non-operated ears

	n	Operated ear	Non-operated ear	
		Mean±SD (mm)	Mean±SD (mm)	*p*
Mastoid dressing (+)	17	15.53±4.3	16.47±3.9	>0.05
Mastoid dressing (-)	20	17.20±2.9	16.90±3.6	>0.05

SD: Standard deviation.

Table 3. Influence of mastoidectomy on results

	n	Operated ear	Non-operated ear	
		Mean±SD (mm)	Mean±SD (mm)	*p*
Mastoid dressing (+), mastoidectomy (+)	9	14.90±4.4	15.70±3.4	>0.05
Mastoid dressing (+), mastoidectomy (-)	8	16.43±4.3	17.57±4.5	>0.05
Mastoid dressing (-), mastoidectomy (+)	8	17.25±3.7	17.25±4.0	>0.05
Mastoid dressing (-), mastoidectomy (-)	12	17.17±2.3	16.67±3.4	>0.05

SD: Standard deviation.

after cochlear implantation operation even if there is an increased risk of wound breakdown and exposure of the implanted device.

Because mastoid dressing provides a wide area of compression over the head, it is usually associated with forehead skin ischemia from restricted venous and lymphatic drainage.[7] In our study only one minor skin lesion was seen as a complication that was encountered in the mastoid dressing group. This kind of lesion may be related with the tightness of the dressing. A too-tight mastoid dressing may even cause unexpected complications such as scalp necrosis and alopecia.[8]

In conclusion the tympanoplasty or tympanoplasty with mastoidectomy does not cause protrusion of the ear. Additionally mastoid dressing was not found necessary for preventing postoperative complications and avoidance from protrusion.

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