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Peripheral Facial Paralysis Following Acute Otitis Media: A 7-Year Experience in a Tertiary Hospital

Akut Otitis Media Sonrası Gelişen Periferik Fasiyal Paralizi: 3. Basamak Hastane, 7 Yıllık Deneyim

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ABSTRACT Objective: This study was performed to evaluate the clinical characteristics, treatment approaches, and outcomes of pediatric and adult patients followed at a tertiary hospital for the treatment of peripheral facial paralysis (PFP) developing after acute otitis media (AOM). **Material and Methods:** Twelve patients who were hospitalized with PFP following AOM at Kayseri City Hospital between July 2018-May 2025 were retrospectively analyzed. The patients were evaluated in terms of age, sex, PFP grade (according to the House-Brackmann scale), treatment method, and recovery status (partial or complete). The pediatric and adult groups were analyzed separately. **Results:** Six patients were in the pediatric group (mean age, 6.67 years) and 6 in the adult group (mean age, 53.5 years). All patients received antibiotic therapy (ceftriaxone) and systemic corticosteroids. Surgically, ventilation tubes were placed in 11 patients; only one pediatric patient underwent cortical mastoidectomy. Complete recovery of PFP was observed in 80% of patients in both groups. One patient in each group showed partial improvement. No bacterial growth was detected in the middle ear cultures. **Conclusion:** PFP following AOM is a rare but clinically significant complication. Conservative treatment should be the first-line approach. In appropriate cases, myringotomy or ventilation tube insertion should be the preferred initial surgical intervention. Mastoidectomy should be reserved for selected cases only.

Keywords: Facial paralysis; mastoidectomy; otitis media; steroids; tertiary hospital

ÖZET Amaç: Bu çalışmanın amacı, akut otitis media (AOM) sonrası gelişen periferik fasiyal paralizi (PFP) nedeniyle 3. basamak bir hastanede takip edilen pediatrik ve erişkin hastaların klinik özelliklerini, uygulanan tedavi yaklaşımlarını ve sonuçlarını değerlendirmektir. **Gereç ve Yöntemler:** Temmuz 2018-Mayıs 2025 tarihleri arasında Kayseri Şehir Hastanesinde AOM sonrası gelişen PFP nedeniyle hospitalize edilen 12 hasta retrospektif olarak incelendi. Hastalar yaş, cinsiyet, PFP derecesi (House-Brackmann skoru), uygulanan tedavi yöntemi ve iyileşme düzeyi (parsiyel/komplet) açısından değerlendirildi. Pediatrik ve erişkin gruplar ayrı ayrı analiz edildi. **Bulgular:** Hastaların 6'sı pediatrik, 6'sı erişkin yaş grubundaydı. Pediatrik grupta ortalama yaş 6,67 yıl, erişkinlerde ise 53,5 yıldır. Her iki gruptaki hastaların tamamına antibiyotik (seftriakson) ve sistemik kortikosteroid tedavisi uygulandı. Cerrahi olarak 11 hastaya ventilasyon tüpü takıldı; yalnızca 1 pediatrik hastaya kortikal mastoidectomi yapıldı. Her iki grupta da hastaların %80'inde PFP tamamen iyileşti. Birer hastada ise parsiyel iyileşme gözlemlendi. Orta kulaktan alınan kültürlerde üreme saptanmadı. **Sonuç:** AOM sonrası gelişen PFP nadir ancak klinik olarak önemli bir komplikasyondur. Tedavide öncelik konservatif yaklaşımlar olmalı, uygun olgularda cerrahi tedavi olarak seçilmesi gereken ilk yöntem miringotomi veya ventilasyon tüp tatbiki olmalıdır. Mastoidectomi yalnızca seçilmiş olgularda tercih edilmelidir.

Anahtar Kelimeler: Fasiyal paralizi; mastoidectomi; otitis media; steroidler; 3. basamak hastane

Acute otitis media (AOM) is one of the most common infectious diseases in childhood.^{1,2} Typically presenting with ear pain, fever, and hearing loss, this condition nowadays usually resolves without complications thanks to the widespread use of antibiotics.

However, AOM may rarely lead to serious intratemporal complications. One such complication, peripheral facial paralysis (PFP), has shown a significant decrease in incidence following the widespread use of antibiotics, with reported rates ranging between

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0.004% and 0.005%.^{3,4} Although PFP is quite rare in both children and adults, it remains clinically significant because of its functional and psychosocial impacts. Although the pathophysiology of PFP has not been fully elucidated, the most widely accepted hypotheses include inflammatory edema causing vascular compression and subsequent nerve ischemia within the fallopian canal, as well as the passage of toxic products through congenital dehiscences leading to direct nerve injury.⁴ The clinical course may vary depending on whether the paralysis is complete or partial. In patients with incomplete paralysis, full recovery is typically achieved through conservative treatment (antibiotics and corticosteroids) and myringotomy, whereas in cases of complete paralysis, the recovery process is longer and surgical intervention may be required in certain situations.⁵ This study was performed to evaluate the clinical characteristics, treatment approaches, and outcomes of pediatric and adult patients followed in our clinic for PFP secondary to AOM. Considering the limited number of case series in the literature, this study is intended to contribute to diagnostic, therapeutic, and follow-up strategies.

MATERIAL AND METHODS

Patients who were hospitalized for treatment of PFP following AOM between July 2018-May 2025 at Kayseri City Hospital were included in the study. AOM was diagnosed on the basis of medical history, physical examination, and clinical findings. Patient data were retrieved from the hospital information management system. Cases of PFP associated with complicated chronic otitis media, Bell's palsy, trauma, or otological surgery were excluded from the study. Patients were evaluated in 2 separate groups: pediatric and adult. Age, sex, PFP grade (according to the House-Brackmann grading system), treatment modalities, and the degree of PFP recovery (partial or complete) were assessed.⁶ Descriptive statistics were used to summarize the data. Continuous variables were presented as mean values with ranges (minimum-maximum), while categorical variables were expressed as frequencies and percentages. The study was conducted in accordance with the principles outlined in the Declaration of Helsinki. Ethical

approval was obtained from the Kayseri City Hospital Non-Interventional Clinical Research Ethics Committee (date: April 29, 2025; no: 420).

RESULTS

Twelve patients who met the inclusion criteria were enrolled in the study. Six (50%) were pediatric and 6 were adult. None of the adult or pediatric patients had any accompanying systemic disease. Among the pediatric patients, 2 were female and 4 were male, with an age range of 2 to 15 years (mean age: 6.67 years) and a mean PFP grade of 3 [House-Brackmann grading system].⁶ All pediatric patients received medical treatment consisting of intravenous antibiotics (ceftriaxone (Desefin, Deva, Türkiye) at 75 mg/kg/day, 10 days) and intravenous corticosteroids (methylprednisolone (Precort-Liyo, Koçak Farma, Türkiye) initiated at 1 mg/kg/day and gradually tapered over 10 days). High-resolution temporal bone computed tomography (CT) was performed on 3 pediatric and 5 adult patients. In the pediatric patient who underwent mastoidectomy as a surgical treatment, coalescent changes were observed in the mastoid air cells. In the other scans, the mastoid air cells were well pneumatized, and no dehiscence was detected in the fallopian canal. Apart from opacification in the mastoid cavity and middle ear due to acute otitis media, no additional pathology was identified. Ventilation tube insertion was performed in 5 patients on the first day of hospitalization, while one underwent cortical mastoidectomy. Complete recovery of PFP was observed in 80% of the patients. In the patient who underwent cortical mastoidectomy, the PFP regressed from grade 4 to grade 2, indicating partial recovery (Table 1). Middle ear fluid samples obtained during surgery were sent for culture in all cases, and no microbial growth was detected. Among the adult patients, 2 were female and 4 were male, with an age range of 22 to 73 years (mean age: 53.5 years) and a mean PFP grade of 3.17. All adult patients received medical treatment consisting of intravenous antibiotics (ceftriaxone at 75 mg/kg/day, 10 days) and intravenous corticosteroids (methylprednisolone initiated at 1 mg/kg/day and gradually tapered over 10 days), and all underwent ventilation tube insertion as surgical treatment on the first day of hospitaliza-

TABLE 1: Demographic data, facial paralysis grade, treatment and recovery outcomes of pediatric patients

Patient	Age	Sex (female-male)	PFP Grade (according to House-Brackmann)	Treatment	Recovery
Patient 1	6	Male	Grade 2	Antibiotic+corticosteroid+ventilation tube	Complete
Patient 2	3	Male	Grade 5	Antibiotic+corticosteroid+mastoidectomy	Partial
Patient 3	15	Female	Grade 3	Antibiotic+corticosteroid+ventilation tube	Complete
Patient 4	2	Male	Grade 2	Antibiotic+corticosteroid+ventilation tube	Complete
Patient 5	7	Male	Grade 4	Antibiotic+corticosteroid+ventilation tube	Complete
Patient 6	7	Female	Grade 2	Antibiotic+corticosteroid+ventilation tube	Complete

PFP: peripheral facial paralysis

TABLE 2: Demographic data, facial paralysis grade, treatment, and recovery outcomes of adult patients

Patient	Age	Sex (female-male)	PFP grade (according to House-Brackmann)	Treatment	Recovery
Patient 1	63	Male	Grade 3	Antibiotic+corticosteroid+ventilation tube	Complete
Patient 2	73	Female	Grade 2	Antibiotic+corticosteroid+ventilation tube	Complete
Patient 3	54	Male	Grade 3	Antibiotic+corticosteroid+ventilation tube	Complete
Patient 4	22	Female	Grade 3	Antibiotic+corticosteroid+ventilation tube	Complete
Patient 5	51	Male	Grade 4	Antibiotic+corticosteroid+ventilation tube	Complete
Patient 6	58	Male	Grade 4	Antibiotic+corticosteroid+ventilation tube	Partial

PFP: peripheral facial paralysis

tion, as in the pediatric patients. Complete recovery was observed in 80% of the adult patients, with 1 patient showing partial recovery (regression from grade 4 to grade 2) (Table 2). As with the pediatric group, the middle ear fluid samples obtained during surgery in adult patients showed no microbial growth.

DISCUSSION

AOM is a common infection in both pediatric and adult populations, typically developing after an upper respiratory tract infection.⁷ Although usually confined to the middle ear and mastoid bone, the infection may occasionally extend from the middle ear cavity to involve adjacent structures.⁸ If the facial nerve running within a bony canal in the middle ear cavity is affected, PFP may develop.

One or more of the pathophysiological mechanisms mentioned in the introduction may have contributed to the development of PFP. However, because the patients presented with PFP and the clinical diagnosis was based on observation, it was practically difficult to determine the exact underlying pathophysiology. PFP following AOM typically be-

gins in the days after the onset of classic AOM symptoms. These patients usually present to a physician during the AOM phase because of severe pain and, in some cases, otorrhea, before the onset of PFP. Tympanic membrane perforation is observed in fewer than 15% of cases.⁹ PFP following AOM typically progresses rapidly to its maximum severity, and the recovery process is generally unpredictable. However, in cases with higher-grade paralysis, the recovery period tends to be longer and the likelihood of residual deficits is greater. Indeed, in our pediatric age group, patient 2 had a PFP grade of 5 and experienced only partial recovery; notably, this patient was also the only one who underwent cortical mastoidectomy as a surgical intervention (Table 1).

Diagnostic methods related to AOM provide limited benefit; temporal bone CT is generally used to rule out intracranial complications.⁴ Some authors advocate that CT imaging should be performed as soon as possible in all patients who develop PFP following AOM.¹⁰ Conversely, others suggest that CT should be reserved only for patients who do not show clinical improvement within 7 days after the initiation of conservative treatment.³ In our case series, imaging

was utilized in 3 pediatric patients and 5 adult patients. Upon evaluation of the images, no dehiscence was detected in the fallopian canal in any of the patients. Among the pediatric patients, cortical mastoidectomy was performed in patient 2, and no abnormalities related to the tympanic or mastoid segments of the fallopian canal were observed intraoperatively during the procedure (Table 1).

PFP developing after AOM is generally considered a clinical complication of bacterial origin. Because of its likely bacterial etiology, antibiotics are recommended as the first-line treatment in PFP following AOM.⁵ When the causative microorganism can be isolated, it is usually one of the pathogens commonly implicated in the etiology of AOM, such as *Streptococcus pneumoniae*, *Haemophilus influenzae*, or *Moraxella catarrhalis*. However, in rare cases where resistant and treatment-refractory strains such as *Staphylococcus aureus*, *Pseudomonas aeruginosa*, or anaerobes are involved, bacterial culture is recommended to guide the selection of appropriate antibiotics or to assess their efficacy.¹¹ In our patients, none of the collected cultures showed bacterial growth. Ceftriaxone, a 3rd-generation cephalosporin with good cerebrospinal fluid penetration, was preferred for treating AOM. The absence of culture growth may be attributed to the patients' early presentation to a physician due to severe pain following AOM and the initiation of antibiotic therapy before the onset of PFP.

The use of corticosteroids, particularly in pediatric patients, remains a topic of debate. According to the updated Acute Otitis Media Management Guidelines by the Italian Society of Pediatrics, the use of systemic corticosteroids is not recommended as a first-line treatment for AOM.¹² Some authors suggest that the use of steroids in combination with antibiotics accelerates the resolution of middle ear effusions compared with antibiotics alone.¹³ In addition, many authors support the use of corticosteroids in PFP, suggesting that particularly when initiated in the early stages of the disease, steroids may shorten the recovery period.¹⁴ However, some argue that steroids should not be used for treating facial paralysis, emphasizing the potential for serious complications such as adrenal suppression, peptic ulcers, and increased susceptibility to infections.¹⁰ In our clin-

ical practice, we use corticosteroids in both adult and pediatric patients presenting with complicated AOM and PFP, provided there are no contraindications.

Myringotomy allows aspiration of fluid from the middle ear through the tympanic membrane, thereby reducing the effect of pressure and infection on the facial nerve, as described in the pathophysiology section. Performing this procedure with a ventilation tube ensures continuous drainage and enables the direct administration of topical treatment to the middle ear. In addition, in the majority of patients with PFP secondary to AOM, this approach appears to be effective.^{4,15,16} In our study, ventilation tube insertion was performed as a surgical treatment in 11 of the 12 included patients, with the tube used both to maintain continuous drainage and to allow topical treatment. In the literature, mastoidectomy-or mastoidectomy combined with facial nerve decompression-has been performed in a limited number of pediatric patients (15 patients; 12.5%).⁵ Mastoidectomy, in particular, has been applied in cases where acute mastoiditis developed or where diffuse opacification of the middle ear and mastoid cavities was observed.^{3,15,17,18} In our study, cortical mastoidectomy was performed as a surgical treatment in one pediatric patient (Table 1; patient 2). This patient had advanced-grade PFP (House-Brackmann grade 5) along with acute mastoiditis, diffuse opacification on CT imaging, and the presence of coalescent changes. In the literature, the addition of facial nerve decompression to mastoidectomy remains controversial; some authors argue that mastoidectomy alone is sufficient.¹⁹ In most cases of AOM with PFP, conservative treatment and myringotomy as first-line approaches are generally adequate.⁵

This study has several limitations. First, the small number of cases limits the generalisability of the findings. Because PFP developing after AOM is a rare complication, multicenter studies involving larger patient populations are needed. In patients who develop PFP, the diagnostic imaging methods used are not based on a standardized algorithm and may vary depending on the physician's preference. This variability may hinder the ability to correlate imaging findings with clinical outcomes.

CONCLUSION

Conservative management should generally be the first-line treatment, with antibiotics as the preferred option. Although the use of corticosteroids-particularly in pediatric patients-remains controversial, we recommend their use in the absence of contraindications because of their anti-inflammatory effects. As a surgical treatment, myringotomy may be performed, and if possible, ventilation tubes can be used to ensure continued drainage and allow for topical therapy. Although mastoidectomy remains controversial, it may be considered in selected cases, particularly in the presence of worsening AOM symptoms, advanced-grade PFP, and radiological signs of complications on CT. The addition of facial nerve decompression to mastoidectomy is still debated, and larger case series are needed to clarify its role.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: Nuri Ünsal; **Design:** Nuri Ünsal; **Control/Supervision:** İbrahim Özcan; **Data Collection and/or Processing:** Nuri Ünsal; **Analysis and/or Interpretation:** Nuri Ünsal; **Literature Review:** Nuri Ünsal; **Writing the Article:** Nuri Ünsal, İbrahim Özcan; **Critical Review:** İbrahim Özcan; **References and Fundings:** Nuri Ünsal.

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