

# The Complications of Otitis Media: Retrospective Assessment of 51 Cases

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## Otitis media komplikasyonları: 51 olgunun retrospektif değerlendirilmesi

**Amaç:** Otitis media komplikasyonlarının saptanması, tanı ve tedavilerinin değerlendirilmesi.

**Gereç ve Yöntem:** Kliniğimizde 1993-2002 tarihleri arasında otitis media tanısı alan ve tedavileri düzenlenen 22680 hastanın dosyaları yeniden gözden geçirildi. Otitis media komplikasyonu nedeni ile tedavi edilen, yaşları 5-56 arasında toplam 51 hastanın (22 kadın, 29 erkek) dosyaları değerlendirmeye alındı. Hastalar yaş, cinsiyet, başvuru semptomları, otoskopik bulgular, operasyon bulguları ve tedavileri açısından değerlendirildi. Saptanan komplikasyonlar intrakraniyal ve ekstrakraniyal olarak iki gruba ayrıldı.

**Bulgular:** Otitis media komplikasyonu tespit edilen 51 hastanın 37'sinde (%72.5) ekstrakraniyal komplikasyon, 13'ünde (%25.4) intrakraniyal komplikasyon, 1'inde ise (%1.9) hem intrakraniyal hem de ekstrakraniyal komplikasyon birlikte görüldü. Hastaların kliniğimize en sık başvuru nedeni kulak akıntısı (%80.3) iken en sık görülen otoskopik bulgular kolestatoma ve granülasyon dokusu/polip idi. Benzer şekilde operasyon sırasında orta kulak ve/veya mastoid kavitede görülen patolojiler arasında en sık kolestatoma ve granülasyon dokusu/polip saptanmıştı. Tüm hastalarımıza intravenöz antibiyotik tedavisi ve kronik otitis media sonucu gelişen komplikasyonlarda radikal mastoidektomi uygulandı.

**Sonuç:** Modern tanı ve tedavi yöntemlerine rağmen günümüzde otitis medialis hastaların dikkatli takibi önemini korumaktadır. Bu hastaların düzenli kontrolleri yapılmalı, hastalıkları hakkında yeterince bilgilendirilmeli ve hastalar oluşabilecek komplikasyonlar açısından uyarılmalıdır.

**Anahtar Sözcükler:** Otitis media, intrakraniyal komplikasyonlar, ekstrakraniyal komplikasyonlar.

## Abstract

**Objectives:** To determine the complications of otitis media, and to evaluate its diagnosis and treatments.

**Materials and Methods:** In our clinic, between 1993-2002, the charts of 22680 patients diagnosed and treated because of otitis media were reviewed retrospectively and the charts of 51 patients treated due to complications of otitis media were assessed. 22 of 51 patients were female and 29 patients were male whose ages ranged from 5 to 56 years. Data were collected on patient's age and gender, initial symptoms, otoscopic findings, operation findings and treatments. The complications were grouped as intracranial and extracranial.

**Results:** 37 patients (%72.5) of 51 patients with complications of otitis media had extracranial complications and 13 patients (%25.4) had intracranial complications and one (%1.9) patient had both intracranial and extracranial complications together. While the most common (%80.3) initial symptom was otorrhea, the most observed otoscopic findings were cholesteatoma and granulation tissue/polyp. Similarly, cholesteatoma and granulation tissue/polyp were the most observed in middle ear cavity and/or mastoid cavity during the operations. We performed radical mastoidectomy and intravenous antibiotic therapy as treatment for complications of otitis media in all patients.

**Conclusion:** Despite current methods of diagnosis and treatment, the careful follow up of patients with otitis media is still important. Their follow up should be done regularly, and they should be well informed about their disease and for probable complications.

**Key Words:** Otitis media, intracranial complications, extracranial complications.

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## Introduction

The complications of otitis media occur as a result of the inflammatory process exceed to exterior of middle ear mucosa and pneumatic cells of temporal bone. Exceeding of middle ear infections occur by two ways; preformal ways (the preformal anatomic spaces between middle ear, inner ear and intracranial cavity) and pathogen ways (the ways which are not preformally but inflammatory process creating transition ways in the middle ear mucosa).<sup>1</sup>

The complications of otitis media are grouped as extracranial complications (mastoiditis with bone destruction, petrositis, subperiosteal abscess, facial paralysis, labyrinthitis) and intracranial complications (meningitis, extradural abscess, subdural abscess, brain abscess, lateral sinus thrombophlebitis and otitic hydrocephalus).<sup>2</sup>

The goals in treatment of OM are to eradicate the infection, to clean the pathologic tissues that may cause to the complications and to prove ventilation and drainage of pneumatic cells of temporal bone by preventing recurrences.<sup>3,4</sup>

In recent years, especially intracranial complications of OM are observed more seldomly with widespread usage of antibiotics. But, it should not be forgotten that this affirmative situation could be insignificance about symptoms and findings, and delay the diagnosis and treatment.<sup>3</sup>

The purpose of this study is to examine the findings, diagnosis and treatment methods of complications of OM with its details and to discuss with information in the literature.

## Materials and Methods

This study is performed between 1993-2002, the charts of 22680 patients diagnosed and treated as otitis media were reviewed retrospectively in Department of E.N.T. of Firat Medicine Center at University of Firat and the charts of 51 patients treated due to complications of otitis media were assessed. 22 of 51 patients were female and 29 patients were male whose ages ranged from 5 to 56.

Age and gender of patients, application symptoms, otoscopic findings, operation findings and treatments were obtained from the data. The complications were grouped as intracranial and extracranial. Temporal CT scans were used to determine the ear pathology spreading in all patients and also patients with intracranial pathology were scanned by cranial CT. Patients with meningitis were diagnosed based on clinical findings and lombar puncture, and their managements were arranged by Department of Infectious Disease. The patients with brain abscess in temporal lobe were operated together with Department of Neurosurgery at the same section both otologically and neurosurgically. All patients received antibiotic therapy empirically and/or according to microbiologic culture results. The combination of cephtriaxone and chloramphenicole applied as empiric therapy, and steroid was added to standard treatment for patients with facial paralysis and brain abscess.

## Results

The complications of otitis media were occurred in 51 of 22680 patients (0.2%). 2884 patients were acute otitis media, 19796 were chronic otitis media. At three patients (0.01%), the complications were secondary to acute otitis media and at 48 patients (0.2%) complications were secondary to chronic otitis media. One of three patients had meningitis as a complication of otitis media was consulted with Department of Pediatric Disease, and other two patients had facial paralysis. 37 patients (72.5%) had extracranial complications, 13 patients (25.4%) had intracranial complications and one patient (1.9%) had both extracranial and intracranial complications together (sigmoid sinus thrombosis and labyrinthitis) among 51 patients with otitis media. The rate of extracranial complications was 0.1% and the rate of intracranial complications was 0.06%. All complications were on the same side with the diseased ear. The distributions of complications of otitis media in 51 patients are demonstrated at (Table 1).

In one patient of 37 patients with complication of chronic otitis media had subperiosteal abscess

**Table 1.** The distributiun of complications of otitis media.

The complications	n=51	%
<b>Extracranial</b>		
Peripheric facial paralysis	12	23.5
Labyrinthitis	10	19.6
Acute mastoiditis	7	13.7
Subperiosteal abcess	5	9.8
Petrositis	2	3.9
Mastoiditis with fistula	2	3.9
Zygomatic abcess	1	1.9
<b>Intracranial</b>		
Meningitis	4	7.8
Lateral sinus thrombophlebitis	3	5.8
Brain abcess in temporal lobe	3	5.8
Extradural abcess	2	3.9
Serebellary abcess	1	1.9
Subdural empyema/effusion	1	1.9
<b>Extracranial+intracranial</b>		
Labyrinthitis	1	1.9
Lateral sinus thrombophlebitis	1	1.9

and acute peripheric facial paralysis, and another one had acute mastoiditis, labyrinthitis and subperiosteal abcess together.

The most initial symptom was otorrhea (80%) (Table 2). The most observed otoscopic findings were cholesteatoma, granulation tissue/polyp and perforation of timpanic membrane. Cholesteatoma and granulation tissue/polyp mostly observed in middle ear cavity and/or mastoid cavity during the operations. The otoscopic findings and operation findings in our patients are demonstrated in (Table 3). All patients were scanned by temporal CT and the patients with intracranial complications were scanned by cranial CT additionally.

**Table 2.** The application symptoms of patients with complications of otitis.

Symptoms	Extracranial complications n (%)	Intracranial complications n (%)
Otorrhea	28/51 (54.9)	13/51 (25.4)
Hearing loss	26/51 (50.9)	12/51 (23.5)
Otalgia/Headache	15/51 (29.4)	14/51 (27.4)
Tinnitus	15/51 (29.4)	10/51 (19.6)
Nausea-Vomiting	12/51 (23.5)	12/51 (23.5)
Vertigo	11/51 (21.5)	10/51 (19.6)
Postauricular swelling	11/51 (21.5)	-
Fever	8/51 (15.6)	9/51 (17.6)

**Table 3.** The otoscopic and operation findings of patients with complications of otitis.

	Otosopic findings		Operation findings	
	n	(%)	n	(%)
Cholesteatoma	30/51	(58.8)	33/51	(64.7)
Granulation tissue/polyp	10/51	(19.6)	11/51	(21.5)
Perforation	48/51	(94.1)	48/51	(94.1)
Purulant drainage	41/51	(80.3)	41/51	(80.3)
Patency in Fallopian canal			6/51	(11.7)
Patency in posterior dural plate			9/51	(17.6)
Patency in sigmoid sinus dural plate			4/51	(7.8)
Patency in lateral semicircular canal			6/51	(11.7)

Radical mastoidectomy was performed in patients with complications of chronic otitis media. Paracentesis and if required ventilation tubes insertion were performed in patients with acute otitis media. All patients received antibiotic therapy empirically and/or according to microbiologic culture result.

### Discussion

If otalgia, fever, nausea-vomiting, vertigo and postauricular swelling develop in a patient with chronic otitis media, the physician should be aware that a complication may happen. Despite the complications related with otitis media dramatically decreased after antibiotic era, the importances of mortality and morbidity related with complication still continue.<sup>3</sup> Nissen and Bui reported that<sup>5</sup> the rate of intracranial complications decreased from 2% to 0.02% after widespread usage of antibiotics.<sup>5</sup> We determined the rate of intracranial complications as 0.06%.

The ratio of intracranial complications to extracranial complications was 0.1-1.7.<sup>6,7</sup> In this study, this rate was 0.35 (14/40) and correlated with data in the literature.

In previous studies, the most common extracranial complications were mastoditis, mastoid abcess, facial paralysis and labyrinthitis subsequently.<sup>8,10</sup> In this study, the most common extracranial complications were facial paralysis (30%) and labyrinthitis (27.5%). 4 patients with labyrinthitis had total hear-

ing loss and in six patients, lateral semisircular canal detected as patent during the operation. Peripheric facial paralysis is a complication due to congenital defect of facial canal during acute otitis media in children and the destruction of bone due to chronic otitis media in adults. In our study, two of patients with facial paralysis were children. In all other cases, intraoperative cholesteatoma was observed and the urgent mastoidectomy and facial nerve decompression were performed in these cases.

Previous studies showed that meningitis is the most common intracranial complication.<sup>3,8,11</sup> In this study, the most common intracranial complications were meningitis and lateral sinus thrombophlebitis. Otogen meningitis develops during the acute disease in children and generally as a result of chronic otitis media in adults. In this study, otogen meningitis was determined in 5-year-old patient during acute otitis media and in other patients as a result of chronic otitis media. It was reported that lateral sinus thrombophlebitis developed because of direct spreading of mastoid infection or thrombophlebitis of small veins in middle ear cavity, and its incidence was 17.4-19% and its mortality was 10%.<sup>11-13</sup> In this study, lateral sinus thrombophlebitis was detected in four patients and radical mastoidectomy was performed. In three of four patients, lateral sinus was open, and necrotic and infected thrombus were aspirated and obliterated with surgicell. Recently, anticoagulant treatment is advised, if the thrombus exist and to prevent the complications related to thrombus.<sup>14</sup> We removed granulation tissues around the lateral sinus and cleaned the extradural abcess also, anticoagulant treatment was applied postoperatively to mentioned patient. The patients with lateral sinus thrombophlebitis were scanned with temporal CT one month after medical and surgical therapy, to vsualise whether intracranial abcess formed. No problem exist in postoperative term.

Munz et al.<sup>15</sup> reported that the most common symptoms in patients with intracranial complications were headache, nausea-vomiting, personality changing and focal deficits. In our study the most

common was otorhea and then hearing loss, otalgia and headache.

Garap and Dubey,<sup>9</sup> reported that cholesteatoma and polypoidal mucosa with granulation tissue were the most common operation findings. We found most commonly chleasteatoma and granulation tissue/polyp. Yetişer et al.<sup>16</sup> operated 24 patients with facial paralysis and reported that fallopian canal was intact in four patients and they determined the bone destruction or dehissance in 20 patients. We operated 10 patients with facial paralysis and we determined that fallopian canal was open in 6 of 10.

Existance of both extracranial and intracranial complications in daily life is very unusal. Dankuc et al.<sup>17</sup> reported a case who was 56 years old had both peripheric facial paralysis and subdural cerebral abscess. We detected a case who was 10 years old had both labyrinthitis and lateral sinus thrombophlebitis.

Garap and Dubey<sup>9</sup> reported that the otoscopic findings in patients with complications otitis media were purulant drainage, choleateatoma, perforation of timpanic membrane and polyp sequentally, in our study the findings were purulant drainage, perforation of timpanic membrane, cholesteatoma and granulation tissue/polyp.

The most important factor which impact on the mortality an morbidity is to delay the diagnosis of complications of otitis media. Despite the advanced antibiotic treatment and surgical techniques, the mortality and morbidity related to complications of otitis media are still keeping on its actuality in the branch of Ear Nose Throat, especially in patients in poor socioeconomic and culturel layers. Osma et al.<sup>3</sup> reported that to perform the canal wall down techniques in patients with complications of otitis media would decrease the necessity of revision surgery and would be safety to prevent possible complications. Singh and Maharaj<sup>18</sup> emphasized that radical mastoidectomy should be a standard treatment in patient with intracranial complications. Garap and Dubey<sup>9</sup> suggested that the canal wall down technic together with meatoplasty should be performed to prove the long term control of chron-

ic otitis media with or without complication in single phase. We performed radical mastoidectomy in all cases, and we performed paracentesis and ventilation tubes insertion when required in patients with acute otitis media. Antibiotic treatment applied according to microbiologic culture results or empirically in all patients. In our society, the symptoms and findings of complications of otitis media are camouflaged due to inappropriate usage of antibiotics, therefore the early diagnosis and required surgical treatment of mentioned complications may be delayed. We think that the mortality and morbidity related to complications of otitis media would decrease, if especially general practitioners were informed about importance of this subject.

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