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ORIGINAL ARTICLE

Extracranial Complications of Chronic Otitis Media

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Objective; To discuss the incidence, clinical presentation, diagnosis and management of extracranial complications of chronic otitis media (COM).

Materials & Methods; In this retrospective study conducted between 1983 and 2007, 97 extracranial complications of COM were included. Intracranial complications of COM and complications of acute otitis media were not included in the study. The analyses included clinical and surgical findings and overall management strategy of the patients who had COM complication.

Results; Labyrinthitis was the most common of 97 extracranial complications, occurring in 43 (44.3%) patients. This was followed by facial palsy in 34 (35%), mastoid abscess in 11 (11.3%), postauricular fistula in 7 (7.3%), and Bezold's abscess in 2 (2.1%). Surgery in addition to antibiotic therapy was the basis of the treatment for these conditions.

Conclusion; Although the extracranial complications rarely cause mortality, early diagnosis and prompt surgical treatment are important in order to reduce the morbidity.

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Chronic otitis media (COM) is defined as persistent infection or inflammation of the middle ear and mastoid air cells [1]. The number of patients affected by complications of COM substantially decreased with the advent of antibiotics, but they are still encountered. Early recognition of the complications is critical for an effective treatment.

Complications of chronic suppurative otitis media (COM) are classified into intracranial and extracranial complications. Extracranial complications can be further divided into intratemporal and extratemporal complications. The aim of this study was to evaluate the incidence, clinical presentation, diagnosis and management of extracranial complications of COM.

Materials and Methods

Medical records of 5089 patients who had surgical treatment for COM between 1983 and 2007 were evaluated retrospectively, and 97 patients who had extracranial COM complication were found. Demographic, clinical and surgical data of the patients with extracranial COM complication were noted.

Results

Patients and Incidence: One hundred and three (2%) of 5089 patients who had surgical treatment for COM had a complication; 97 of them were extracranial (1.9%) and 6 were intracranial (0.1%).

Of 97 extracranial complication cases, 41 (42.3%) were female and 56 (57.7%) were male with ages ranging from 5 to 83 years (mean age, 43.9 years). Two (2.1%) patients were in the first decade, 9 (9.3%) in second, 16 (16.5%) in third, 22 (22.7%) in fourth, 8 (8.2%) in fifth, 17 (17.5%) in sixth, 13(13.4%) in seventh, 7 (7.2%) in eighth and 3 (3.1%) in ninth decade. Table 1 shows the distribution of ages of the patients with extracranial complications of COM.

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Clinical Findings: The clinical features consisted otorrhea in 43 (44.3%), headache in 20 (20.6%), vertigo in 43 (44.3%), facial palsy in 34 (35%), postauricular swelling in 10 (10.3%) and postauricular fistula in 7 (6.2%) patients. Duration of otorrhea was <5 years in 21.5 %, 5-10 years in 35.6%, and >10 years in %42.9 of the patients. Otoscopic findings were pars tensa perforation in 56 (57.7%), cholesteatoma in 36 (37.1%) and granulation and/or polyp in 5 (5.2%) patients (Table 2).

Complications: Labyrinthitis was the most common extracranial complication, and was encountered in 43 (44.3%) patients. This was followed by facial palsy in 34 (35%), mastoid abscess in 11 (11.3%), postauricular fistula in 7 (7.3%), and Bezold's abscess in 2 (2.1%) patients (Figure 1).

Surgical Procedures and Findings: Ninety-five of 97 patients underwent surgical treatment. Two patients

Table 1. Age distribution of the patients with extracranial complication of COM.

Patient age (decade)	No. Patients	Percentage
First	2	2.1%
Second	9	9.3%
Third	16	16.5%
Fourth	22	22.7%
Fifth	8	8.2%
Sixth	17	17.5%
Seventh	13	13.4%
Eighth	7	7.2%
Ninth	3	3.1%

Table 2. Demographic, clinical and surgical data of the patients.

Parameter	No. patients (%)
Age (in years); range (mean)	5-83 (43.9)
Sex (M/F)	41/56 (42.3%/57.7%)
Symptoms	
Otorrhea	43 (44.3%)
<5 years	21.5 %
5-10 years	35.6%
>10 years	42.9%
Headache	20 (20.6%)
Vertigo	43 (44.3%)
Facial palsy	34 (35%)
Postauricular swelling	11 (10.3%)
Postauricular fistula	7 (6.2%)
Otoscopic findings	
Pars tensa perforations	56 (57.7%)
Cholesteatoma	36 (37.1%)
Granulation and/or polyp	5 (5.2%)
Type of surgical procedures	
CWD	68 (71.6%)
CWU	27 (28.4%)
Surgical findings	
Cholesteatoma	40.6%
Granulation and/or polyp	22.8%

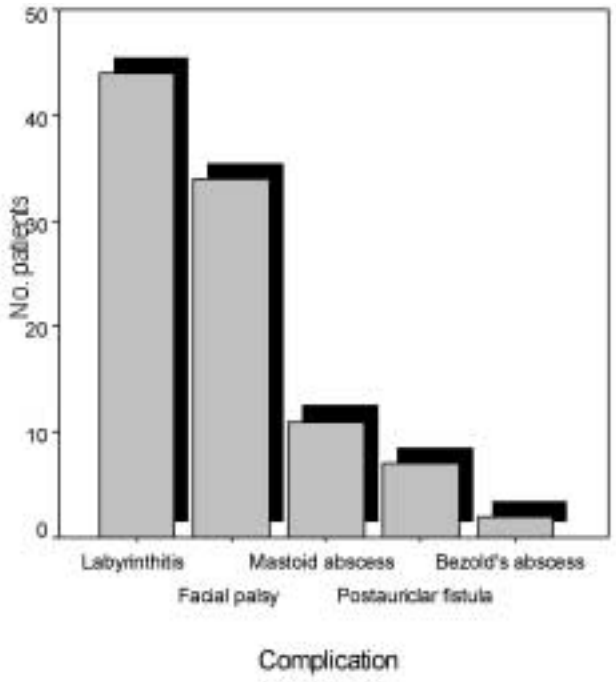

Figure 1. Extracranial complications of chronic otitis media.

with facial palsy could be treated medically rather than surgery because of serious systemic problems. Sixty-eight (71.6%) patients underwent CWD (canal wall down) mastoidectomy and 27 (28.4%) patients underwent CWU (canal wall up) mastoidectomy. There was cholestatoma in 40.6% of the cases. Granulation and/or polyp tissue was found in 22.8% of the cases.

Twenty-eight (87.5%) patients with facial palsy had destruction or dehiscence in the bone covering the facial nerve. Facial canal dehiscence was observed in the tympanic portion in 26 (92.8%), in the mastoid portion in 5 (17.8%), and in the geniculate ganglion in 1 (3.6%) of the cases. There was no dehiscence in the fallopian canal in the remaining four cases. Facial canal was dehiscent in 7 patients without preoperative facial palsy. In patients with labyrinthitis semicircular canals were intact in 36 (83.7%) while labyrinthine fistula was observed in the lateral semicircular canal in 7 (16.3%) patients.

Discussion

Different prevalence rates for extracranial complications of COM have been reported to date. Kangsanarak et al. [2] found extracranial complications in 0.45% of the COM cases. Osma et al. [3] reported that the prevalence of extracranial complications was 1.35%. In a recent study, which included 91 patients with complications of COM with cholesteatoma, 52 patients had extracranial complications. [4] In our study the prevalence of extracranial complications was 1.9%.

Cholesteatoma can cause labyrinthine fistula, and serous labyrinthitis is the most common complication [5]. Osma et al. [3] reported 5 cases of labyrinthitis among 39 extracranial complications. Dubey and Larawin [6] reported 2 (3%) serous labyrinthitis among 70 patients. In our study, serous labyrinthitis was the most common extracranial complication of COM (44.3%). In patients with labyrinthitis semisircular canals were intact in 36 (83.7%) patients while labyrinthine fistula was observed in the lateral semicircular canal in 7 (16.3%) patients. Patients suspicious for labyrinthitis should be hospitalized and parenteral antibiotics with good cerebrospinal fluid penetration should be initiated before surgical treatment.

Facial nerve palsy as a complication of COM is often associated with dehiscence in the bone covering the facial nerve. However, facial palsy may occur without dehiscence or destruction of the bony facial canal. Osteitis, direct inflammation of the nerve by bacteria or by neurotoxic substances, which may be secreted from the cholesteatoma matrix may also be the etiologic factors for the facial palsy secondary to COM [7, 8]. Kangsanarak et al. found facial palsy as the most common complication in 0.26% [2]. Savic and Djeric [9] and Altuntas et al.[9,10] reported facial palsy incidence as 5.1% and 1.7%, respectively. In a recently published study 14% of the patients among 70 COM complications had otitic facial palsy [6]. Facial palsy was the second most common extracranial complication in our series with a rate of 0.66% among 5089 cases of COM. Facial nerve palsy secondary to COM should be treated surgically. In this study, 30 patients underwent CWD mastoidectomy and two patients underwent CWU mastoidectomy for facial

palsy. Twenty-eight (%87.5) patients with facial palsy had bony destruction or dehiscence of the facial canal. The most common site for this destruction is tympanic portion of the fallopian canal [5,8,9]. Facial canal dehissence was observed in tympanic portion in 26 (%92.8), mastoid portion in 5 (%17.8), geniculate ganglion in 1 (%3.6) of the cases. No destruction or dehiscence of the fallopian canal has been found in four cases. In sixteen (%50) patients with facial palsy who underwent surgical treatment cholesteatoma were encountered during the surgery. Two patients could not be operated and treated with intravenous antibiotics due to serious systemic diseases which did not allow mastoidectomy under general anesthesia.

The blockage of the aditus by cholesteatoma in the mastoid antrum and the remainder mastoid air cells may lead to subperiosteal abscess. Development of subperiosteal abscess with or without fistula provides reduction in pus pressure within the mastoid air cells, which in turn reduces the chance of infection spreading intracranially [6]. In most of the studies mastoid abscess was found as the most common extracranial complication [3,6]. In Rupa and Raman's study [11] mastoid abscess were seen more than half of the patients with complications. Mastoid abscess with or without superiosteal abscess was observed in 11 (15.5%) patients in this study. Postauricular fistula was seen in 7 (7.2%) patients.

Initiation of parenteral antibiotics before any surgical intervention is important to control the infective process and improve the patient's general condition [12]. Cholesteatoma is major surgical finding in a complicative COM. [2,3]. Samuel et al. [13] reported that granulations played a bigger role in the intracranial spread of the disease than the cholestetoma. CWD mastoidectomy should be performed in cases which will be hard to follow up postoperatively, and also in the presence of suspected irreversible changes including extensive cholesteatoma and severe granulation with poor eustachian tube function [2]. In this study parenteral antibiotics were given to all patients regardless the type of the complication. Ninety-five patients underwent surgical treatment for extracranial complications of COM. Sixty-eight (71.6%) patients underwent CWD mastoidectomy and 27 (28.4%) patients underwent CWU mastoidectomy. Cholestatoma with or without granulations was found %40.6 of cases. Granulation and/or polypi were found %22.8 of cases.

Conclusion

Despite the decreased incidence as a result of increased health care services, COM can still cause complications. Prompt diagnosis and both medical and surgical treatments are necessary to decrease the morbidity. Labyrinthitis and facial palsy are the most common extracranial complications of COM.

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