

# Mastoiditis in Kelantan

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## Summary

Chronic mastoiditis and subperiosteal abscess are rarely seen nowadays in most countries. Thirty-four cases of mastoiditis were reviewed to find out the prevalence of chronic mastoiditis in the east coast of Malaysia. Twenty (58.82%) of these cases were a sequelae of chronic suppurative otitis media with cholesteatoma. All the patients with chronic mastoiditis were more than six years old. Forty-five per cent of cases with chronic mastoiditis had a well pneumatized mastoid air cell on the unaffected side. The occurrence of chronic mastoiditis or cholesteatoma in a well pneumatized mastoid is not really as rare as was thought to be. X-ray of the mastoids is very useful in diagnosing patients with chronic mastoiditis and cholesteatoma. Mastoiditis is uncommon in adults and whenever a case is seen, an underlying pathology like cholesteatoma should be suspected.

**Key Words:** Acute mastoiditis, Chronic mastoiditis, Cholesteatoma

## Introduction

Mawson<sup>1</sup> described "acute mastoiditis as coalescence of air cells which occurs in cellular mastoids and is derived by extension from an acute otitis media". He further stated that "chronic mastoiditis is invasion of bone by granulation tissue arising in the first instance from chronic otitis media. It nearly always occurs in mastoids in which pneumatization is absent or faulty".

The incidence of mastoiditis and mastoid abscesses has become increasingly rare in developed countries since the advent of antibiotics. Most of the reports in the literature are of acute mastoiditis except for "a few articles which discusses about chronic mastoiditis"<sup>2-4</sup>. The incidence of chronic mastoiditis is much lower than that of in most countries. On the contrary we seen more cases of chronic mastoiditis as compared to acute mastoiditis. The objective of this retrospective study was to find out the prevalence of acute and chronic mastoiditis in the east coast of Peninsular Malaysia.

## Patients and Methods

The clinical records of the patients with mastoiditis admitted to the University Hospital, Kubang Kerian, Kelantan, between November 1985 and October 1992 were studied.

The diagnosis of mastoiditis was based on the following criteria.

1. Otitis media (acute or chronic) with postauricular swelling, erythema, protrusion of the auricle with mastoid tenderness.
2. Abnormality of the mastoid area in the X-ray (coalescence or cavity).

Whenever there was fluctuation in the post auricular region, the diagnosis of subperiosteal abscess was made.

Laboratory results of these patients were also reviewed. Pus from the mastoid area were sent for culture in these patients. X-rays of the mastoid in these patients were studied in detail by the first author.

## Results

There were 34 cases of mastoiditis admitted to the hospital during the seven years period. The age of the patients varied from 2 months to 49 years, with a mean age of 17.15 years. There were 6 patients under the age of 1 year. The majority (57.1%) of the acute mastoiditis patients in this group were less than 2 years. The age of patients with chronic mastoiditis varied from 6 years to 38 years. There were 20 males (58.8%) and 14 females (41.2%). The duration of the ear discharge varied from a few days to more than 20 years with a mean of 63.19 months.

Thirty-two of these cases had presented with subperiosteal mastoid abscess and two with acute mastoiditis. Those two patients were 2 months and 4 months old respectively and responded well to antibiotic therapy. Fourteen cases (41.2%) had resulted as a complication of acute otitis media (acute mastoiditis) and 20 cases as a complication of chronic suppurative otitis media (chronic mastoiditis).

Intracranial complications were present in 2 patients, one had lateral sinus thrombosis and the other meningitis. Four patients had facial nerve palsy at the

time of admission. One of the patients a 8-year-old boy had presented with bilateral mastoiditis which was later diagnosed to be of tuberculous origin. He also had a tuberculoma of the brain.

X-rays of the mastoid on the affected side showed coalescence in 14 cases (41.2%), sclerosis in 3 patients (8.8%) and presence of a cavity in 17 patients (48.5%).

Modified radical mastoidectomy was done in 20 cases (58.8%), cortical mastoidectomy in 12 cases and conservative treatment in two infants.

Pus had been aspirated in 32 patients and sent for culture. Specimens were not obtained from two patients because they only had mastoiditis. In four patients two organisms were grown in culture. *Proteus mirabilis* had been the most common organism isolated (Table I).

## Discussion

Chronic mastoiditis is receiving less attention in the world literature now because it is rarely seen in developed countries. In Kelantan, chronic mastoiditis (58.8%) seems to occur more commonly than acute mastoiditis (41.2%).

Males predominate in this study group as in other studies<sup>3,5</sup>. All the patients in this study with chronic mastoiditis were more than 6 years old.

Mastoiditis is uncommon in adults. Whenever it occurs, some underlying cause such as cholesteatoma should be suspected. Most of the subperiosteal mastoid abscesses we see follow secondary cholesteatoma. This finding supports Portmann's theory of migration of epidermal cells from the meatal wall into the antrum with subsequent formation of cholesteatoma<sup>6</sup>.

X-rays of the mastoid are not of much use in the diagnosis of acute mastoiditis. It is also said that mastoid radiographs do not play any role in making the decision to operate<sup>7,8</sup>. In cases of subperiosteal abscesses occurring in the presence of chronic suppurative otitis media with cholesteatoma, X-ray of the mastoid is very useful. In this series in 17 out of 20 cases of chronic mastoiditis, a cavity was seen in

**Table I**  
Bacterial flora cultured from pus obtained from the mastoid abscess in 34 cases of Mastoiditis

Organism	Chronic Mastoiditis	Acute Mastoiditis
Beta hemolytic streptococcus	1	3
<i>Staph aureus</i>	3	1
<i>Staph epidermidis</i>	1	-
<i>Enterococcus</i>	1	-
<i>Proteus mirabilis</i>	11	-
<i>Pseudomonas aeruginosa</i>	3	1
<i>Klebsiella pneumonia</i>	1	-
<i>Mycobacterium tuberculosis</i>	1	-
No growth	3	6
Not done	-	2

the preoperative X-ray suggesting cholesteatoma and this was confirmed during the operation.

The pathogenesis of a subperiosteal abscess in an ear with cholesteatoma could be due to blockage of the aditus by cholesteatoma in the antrum and the rest of the mastoid air cells. This prevents free flow of pus into the middle ear and the external auditory meatus, thus trapping the pus in the mastoid lateral to the cholesteatoma. The pus under tension extends through the periosteum, resulting in a subperiosteal abscess<sup>2</sup>.

The classical teaching in otolaryngology<sup>1,9</sup> is that chronic mastoiditis infrequently develops in pneumatized temporal bone and cholesteatomas are rare. Long standing disease in a pneumatized mastoid, however, may produce sclerosis to the point of obliteration of the pneumatic spaces.

When we looked at the mastoid air cells on the unaffected side of the twenty chronic mastoiditis cases, nine cases (45%) had well pneumatized mastoids. In these cases either cholesteatoma has occurred directly in a pneumatized mastoid; or following chronic disease, mastoid air cells must have become sclerosed and later cholesteatoma could have formed. Either way occurrence of cholesteatoma or chronic mastoiditis in a pneumatized mastoid is not really rare as was thought before. The presence of extensive air cell system does not rule out the presence of cholesteatoma.

Otologists encountering mastoiditis with subperiosteal abscess must be prepared technically to perform extensive procedures like radical mastoidectomy as indicated by the extent of the pathologic findings.

The organisms cultured from the abscess in this study, were predominantly gram positive in patients with acute mastoiditis and gram negative in patients with chronic mastoiditis. The finding is quite understandable since chronic mastoiditis is a sequelae of chronic otitis media. In most of the other studies, gram positive organisms like *Streptococcus pyogenes*, pneumococcus, and *Staphylococcus aureus* were commonly found<sup>4,10-12</sup>. *Proteus mirabilis* was the most common organism isolated in chronic mastoiditis in

this series, like that reported from South Africa<sup>13</sup>. A high incidence of anaerobic organisms in mastoiditis has also been reported<sup>14</sup>. In our cases cultures for anaerobic organisms were not done routinely.

Acute mastoiditis responds well to medical treatment<sup>15</sup>. In this series only two cases presented with acute mastoiditis and both responded to medical treatment. The incidence of complications from mastoiditis has diminished markedly since the advent of antibiotics<sup>16</sup>. The complications of acute mastoiditis has been noted to occur less commonly in well pneumatized mastoids<sup>17</sup>. In this study group one case of acute mastoiditis with subperiosteal abscess had meningitis and responded well to treatment. All other cases (five) with complications were following chronic mastoiditis.

Though tuberculous mastoiditis is rare these days, one has to consider the possibility in cases where there are two or more of the following symptoms and signs; profuse discharge not responding to medication, pain of moderate to severe in intensity, marked hearing loss, pale granulations, facial paralysis, vertigo, history of active or past tuberculosis<sup>18</sup>. In our case the patient had most of these features. In this patient antituberculous therapy has been given and a modified radical mastoidectomy had been performed.

Many of our patients do not seek treatment early when they have ear discharge and come to the hospital only when the abscess had formed. This could be attributed to a few factors like low educational level of the patients (or parents), distance of the hospital from the households etc. We noticed a downward trend in the incidence of mastoiditis in the recent years. As the health care system in the country improves over the years, we expect a marked reduction in the incidence of mastoiditis in the near future.

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