RESEARCH ARTICLE

Ten years incidence of intracranial complications of chronic suppurative otitis media

Khaled M. Mokbel, MD

1Professor of ENT, Department of ENT, Mansoura University Main Hospital and Emergency Hospital, Faculty of Medicine

Abstract

Background: complications of chronic Suppurative Otitis Media have mortality and morbidity risks which are caused by Reluctance in its management with late presentation. The aim of this study was to investigate, the frequency, mortality and morbidity of intracranial complications of chronic suppurative otitis media admitted at our tertiary University Hospital in ten years from 2006 -2016. Result: The total number of patients reported with intracranial complication due to chronic suppurative otitis media was 64 patients. Brain abscess and Meningitis were present in 24 (37.5%) and 22 cases (34.4%). In 14 cases (21.8%) extradural abscess was found while 4 (6.3%) had lateral sinus thrombosis. Conclusion: Brain abscess is the most common and dangerous complication in chronic suppurative otitis media in our region.

Keywords: Suppurative Otitis Media, Intracranial complications, Brain abscess, Meningitis

1 | INTRODUCTION

Complications of suppurative otitis media are still seen by Otolaryngologists and not yet eliminated even after the innovation of modern antibiotics. Poor hygiene, ignorance and lack of education in poor socioeconomic countries play a universal role in risk of otitis media (1). Complications has reduced significantly with spread and availability of antibiotics but still continue to occur and can be lethal if not diagnosed early and promptly managed (2),(3) Complications of otitis media still occur with high mortality. Medical polices in several countries still need to collect epidemiological data to stand on the incidence of complications of otitis media with the priorities for prevention and treatment.

This study was carried out to assess frequency and presentation of intracranial complications of chronic suppurative otitis media in our tertiary university emergency Hospital within 10 years.

Supplementary information The online version of this article (https://doi.org/10.15520/jmrhs.v3i6.211) contains supplementary material, which is available to authorized users.

Corresponding Author: Khaled M. Mokbel, MD
Khaled M. Mokbel, MD
Email: ootoloy@yahoo.com
2 | MATERIALS AND METHODS

The study was started after taking the approval of our institutional research ethical committee. Cases with chronic suppurative otitis media with intracranial complications admitted at our tertiary university Hospital were reviewed in the period from 2006 to 2016. Patients presenting to ENT department and diagnosed as having intracranial complications due to Suppurative Otitis Media were included in the study. History, clinical examination and investigation were reviewed. CT scan and MRI were recorded in all patients with suspected intracranial complications. All patients were put on antibiotics that cross blood brain barrier and guided by culture. Dehydrating measures mannitol iv with or without, steroids to reduce oedema and intracranial tension. Neurosurgical and ophthalmic consultations were done. Brain abscess in most cases was first treated by neuro-surgical departments and later on mastoid exploration was done in ENT department. According to recommendations given by some neurosurgeons, mastoid exploration was done immediately after drainage of brain abscess without delay in 6 cases. In meningitis patients were treated conservatively first with antibiotics and lumbar puncture then mastoid exploration was carried out after stability of patient conditions. In extradural abscess mastoid surgery was achieved concomitantly. In lateral sinus thrombosis mastoid exploration with removal of infected thrombus was done with internal jugular ligation in all cases.

3 | RESULTS

In 64 patients with intra cranial complications males were 36 (56.3%), females were 28 (43.7%) (Table 1). Most of the patients with intra cranial complications were between the age of 15-35 years (45 patients, 70.3%) and 19 (29.7%) were between 35-60 years (table 1).

All patients with intra cranial complications were having foul smell discharge (Otorrhea), headache 100%; fever 79.37% and decreased hearing were present in 100% of patients. Otalgia in 84.13% and vertigo was present 22.22 % of the patient. Vomiting in 55.55%. Culture from ear swaps were taken from all patients and sensitivity tests were done for appropriate antibiotic (table-3).

Staphylococcus aureus and Pseudomonas aeruginosa were the most common isolates in brain abscess, extradural abscess and lateral sinus thrombosis. Streptococcal pneumonia and Haemophilus influenza were the most common in meningitis. The common intra cranial complications were brain abscess in 37.5% (24 cases), meningitis in 34.4% (22 cases), extradural abscess 21.8% (14 cases), lateral sinus thrombosis 6.25% (4 cases). Extradural abscess were discovered during surgical exploration of other intracranial complications, in 7 cases so total extradural abscesses was 21 cases (32.8%).

In our study cure rate without morbidity was achieved in 48 cases (75%). Mortality was in three cases with brain abscess and one case with meningitis. Morbidity was reported in 12 cases (18.75%) in the form of different degrees of neurological disturbances as ataxia, amnesia and persistent headache. There was 2 cases of ataxia, 2 cases of amnesia and 8 cases with persistent headache. Overall mortality rate

| Gender | No. | %   | 15-35 years | >35-60 |
|--------|-----|-----|-------------|--------|
| Male   | 36  | 56.3% | 27          | 9      |
| Female | 28  | 43.7% | 18          | 10     |

| Complications       | No. patients | Mortality | Morbidity |
|---------------------|--------------|-----------|-----------|
| Brain Abscess       | 24           | 37.50%    | 3         |
|                     |              |           | Ataxia    |
|                     |              |           | Amnesia   |
|                     |              |           | Headache  |
| Meningitis          | 22           | 34.38%    | 1         |
|                     |              |           | Headache  |
| Extradural abscess  | 14           | 21.87%    | 0         |
| (alone)             |              |           |           |
| Concomitant abscess | 7            | 32.8%     |           |
|                     |              |           |           |
| Lat. Sinus thrombosis | 4     | 6.25%    | 0         |
|                     |              |           | Headache  |
was 6.25% (4 cases); 3 cases due to brain abscess, one from meningitis. The type of suppurative otitis media was attic-antral in 75% of cases and tympanic 5% and 20% mixed type.

4 | DISCUSSION

Early diagnosis, modern imaging and new antibiotics without doughty has improved the outcome of intracranial complications of otitis media (4). The incidence of intracranial complications was improved from 2.3% to 0.15% with recent surgical techniques (5),(6). In our study 70.3% (45 cases) were between ages of 15-35 years so this was comparable with the study of (7). Wanna et al (2) report the most common intracranial complications include meningitis, followed by brain abscess. In our study brain abscess was the commonest and most serious intracranial complications, it was 37.5% (24 cases) and most of mortalities occurred with it. This was matched with the study of (8),(9). In some studies it was reported to be more than 40% and most common in children and young adults (10),(11). Many neurosurgeons and Otolaryngologists pre-fer to do mastoidectomy later after brain abscess drainage; on the other hand some neurosurgeons recommend mastoid surgery to be done immediately after drainage without delay for rapid eradication of the offending focus of infection to prevent recollection and help rapid healing (12). For that reason 6 cases in our study were undergone abscess drainage with immediate mastoidectomy. In those six cases brain abscesses were drained once with no recollection. In our study staphylococcal aureus was cultured in most brain abscesses, this agreed with the study of Lakshmi (13). Kuczowski and Mikaszewski, (14) re-port that meningitis was the most common intra cranial complication, but in our study it was the sec-ond common with incidence of 34.4%. Patient with meningitis usually presents with fever, headache, vomiting, and neck stiffness. The diagnosis can be made by CSF examination and culture sensitivity. Streptococcal pneumonia was found in most cases of meningitis because it occurs in acute exacerbation of chronic otitis media as in the study of Perry and Patel (15),(16). CT scan is done to exclude multiple complications like brain abscess. Mortality rate of meningitis is being reduced to 8–36% (5). In our study the mortality rate from meningitis was 12.50%. The formation of Lateral Sinus Thrombosis may be pre-ceded by posterior extradural abscess which causes endophlebitis and mural thrombus which propagates proximal and distal (14). There may be high fever with rigors. CT scan shows delta sign (17). MR venography is now the investigation of first choice in the investigation of LST. Magnetic resonance imaging (MRI) may show increase in intensity in the presence of the thrombus (18). The incidence of lateral sinus thrombosis reported in the study of Manolidis and Kutz (19) to be 6% and its mortality in preantibiotic era had been reported to be 100% but been dropped to 0-25% after advent of anti-biotics (20). Lateral sinus thrombosis in our study was detected in 4 patients (6.3%) and the organism isolated was staph aureus in three cases. Ligation of internal jugular vein is still controversial and reserved by some surgeons to cases with septicemia with disseminated embolization (21), but in our cases the internal jugular vein was ligated to prevent disseminated infarctions. The incidence of extradural abscess in patients with intra cranial complications has been reported to be 16-22%.
It is usually present with headache and pulsating discharge and its diagnosis was made by clinical examination and CT scan. Extradural abscess in this study was found alone in 14 cases (21.8%) and 7 in concomitant with other complications with total incidence of 32.8% so still the third complication. Kuczkowski and Mikaszewski,(14) reported that extradural collection was the most common complication discovered during surgical exploration. Rate of mortality of intracranial complication in the study of (22),(5) was 14-32.6%, whereas in our study mortality rate was 6.25% (4 cases) which occurred mostly due to brain abscess similar mortality rate reported in Penido et al (9). The morbidity rate is reported to be between 11.6 and 27.9% (5),(23). In our study morbidity was 18.8% with headache was the most common.

5 | CONCLUSION

The otogenic complications are decreasing, however the morbidity and mortality is still high even with the advent of antibiotics and surgical treatment. The most important in our opinion is that the Otolaryngologist must keep in mined the early symptoms and signs of impending intracranial complication. Early eradication of middle ear disease is a very important factor and unique in prevention of intracranial complications. The most serious complication is the brain abscess that must be excluded in suspected cases. Some neurosurgeons gives recommendation for immediate mastoidectomy in the same sitting of brain abscess drainage.

No conflict of interest

REFERENCES

1. Guys N, Ramsey T, Kandinov A, Svider PF, Jyung RW, Hong R, et al. Interplay Between Socioeconomic Status and Otitis Media Disease Burden in Resource-rich and Resource-poor Nations. Otolaryngology & Neurotology. 2018;39(9):e817–e824. Available from: https://dx.doi.org/10.1097/mao.0000000000001943. doi:10.1097/mao.0000000000001943.

2. Wanna GB, Dharamsi LM, Moss JR, Bennett ML, Thompson RC, Haynes DS. Contemporary Management of Intracranial Complications of Otitis Media. Otolaryngology & Neurotology. 2010;31(1):111–117. Available from: https://dx.doi.org/10.1097/mao.0b013e3181c2a0a8. doi:10.1097/mao.0b013e3181c2a0a8.

3. Smith JA, Danner CJ. The incidence of complications of chronic otitis media and cholesteatoma. Otolaryngol Clin North Am. 2006;39(6):1237–55.

4. Yates PD. Otitis Media in Current Diagnosis and treatment in Otolaryngology- Head & Neck Surgery. 2004; Vol. 2: 695-706.

5. Kangsanarak J, Foonant SNN, Ruckphaopunt K. Intracranial complications of suppurrative Otitis media 13 years experience. Am J Otol. 1995;16(1):104–113.

6. Palva T, Virtanen H, Mäkinen J. Acute and latent mastoiditis in children. The Journal of Laryngology & Otology. 1985;99(2):127–136. Available from: https://dx.doi.org/10.1017/s0022215100096407. doi:10.1017/s0022215100096407.

7. Osma U, Cureoglu S, Hosoglu S. The complications of chronic otitis media: report of 93 cases. The Journal of Laryngology & Otology. 2000;114(2):97–100. Available from: https://dx.doi.org/10.1258/0022215001905012. doi:10.1258/0022215001905012.

8. Complications of temporal bone infection. In: CW C, LA FJH, DE KCS, editors. Otolaryngology Head and Neck Surgery. Mosby Year Book; 1993. p. 2840–64.

9. Penido NDO, Borin A, Iha LCN, Suguri VM, Onishi E, Fukuda Y, et al.. Intracranial complications of otitis media: 15 years of experience in 33 patients. SAGE Publications; 2005. Available from: https://dx.doi.org/10.1016/j.otohns.2004.08.007. doi:10.1016/j.otohns.2004.08.007.

10. Murthy PSN, Sukumar R, Hazarika P, Rao AD, Mukulchand, Raja A. Otogenic brain abscess in childhood. International Journal of Pediatric Otorhinolaryngology. 1991;22(1):9–17. Available from: https://dx.doi.org/10.1016/
TEN YEARS INCIDENCE OF INTRACRANIAL COMPLICATIONS OF CHRONIC SUPPURATIVE OTITIS MEDIA

0165-5876(91)90092-p. doi:10.1016/0165-5876(91)90092-p.

11. Rupa V, Raman R. Chronic Suppurative Otitis Media: Complicated versus Uncomplicated Disease. Acta Oto-Laryngologica. 1991;111(3):530–535. Available from: https://dx.doi.org/10.3109/00016489109138379. doi:10.3109/00016489109138379.

12. Kurien M, Anand J, Mathew J, Mathew C. Otogenic intracranial abscess. Concurrent cranietomy and mastoidectomy- changing trends in a developing country. Arch Otolaryngol Head Neck surg. 1998;124:1353–1356.

13. Lakshmi V. Microbiological Spectrum of Brain Abscess at a Tertiary Care Hospital in South India: 24-Year Data and. Review Patholog Res Int. 2011;.

14. Kuczkowski J, Mikaszewski B. Intracranial complications of acute and chronic mastoiditis: report of two cases in children. International Journal of Pediatric Otorhinolaryngology. 2001;60(3):227–237. Available from: https://dx.doi.org/10.1016/s0165-5876(01)00524-9. doi:10.1016/s0165-5876(01)00524-9.

15. Perry BP, Rubinstein JT. Meningitis Due to Acute Otitis Media and Arachnoid Granulations. Annals of Otology, Rhinology & Laryngology. 2000;109(9):877–879. Available from: https://dx.doi.org/10.1177/000348940010900917. doi:10.1177/000348940010900917.

16. Patel K, Clifford DB. Bacterial Brain Abscess. The Neurohospitalist. 2014;4(4):196–204. Available from: https://dx.doi.org/10.1177/1941874414540684. doi:10.1177/1941874414540684.

17. Neto JL, Saffer M, Rotta FT, Arrarte JLF, Brinckmann CA, Ferreira P. Lateral sinus thrombosis and cervical abscess complicating cholesteatoma in children: case report and review. International Journal of Pediatric Otorhinolaryngology. 1998;42(3):263–269. Available from: https://dx.doi.org/10.1016/s0165-5876(97)00139-0. doi:10.1016/s0165-5876(97)00139-0.

18. Fink JN, McAuley DL. Mastoid Air Sinus Abnormalities Associated With Lateral Venous Sinus Thrombosis. Stroke. 2002;33(1):290–292. Available from: https://dx.doi.org/10.1161/hs0102.101016. doi:10.1161/hs0102.101016.

19. Manolidis S, Kutz JW. Diagnosis and Management of Lateral Sinus Thrombosis. Otology & Neurotology. 2005;26(5):1045–1051. Available from: https://dx.doi.org/10.1097/MAO.0000170536.49646.cc. doi:10.1097/MAO.0000170536.49646.cc.

20. Seven H, Ozbal AE. Turgut S Management of otogenic lateral sinus thrombosis. Am J Otolaryngol. 2004;25(5):329–362.

21. Dew LA, Shelton C, Cummings CW, Harker LA, Krause CJ. Complications of temporal bone infection. In: Otolaryngology and Head and neck surgery. IV. Mobsy Year-Book, Inc; 1998. p.3047–3075.

22. Samuel J, Fernandes C. Steinberg JLIntracranial otogenic complications: a persisting problem. Laryngoscope. 1986;96:272–280.

23. Navacharoen W, Soprasuchart A. Intracranial complications of Otitis media; a five-year study. J Infect Dis Antimicrob Agents (Thai). 1984;1:52–59.

How to cite this article: Mokbel, K.M., MD Ten years incidence of intracranial complications of chronic suppurative otitis media. Journ-al of Medical Research and Health Sciences. 2020;996 –1001. https://doi.org/10.15520/jm-rhs.v3i6.211