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Current Treatment Option of Osteoma in the Mastoid of the Temporal Bone

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Abstract

Osteomas are osteoblastic mesenchymal tumour composed of well-differentiated mature osseous tissue with a laminar structure. Osteoma is a benign slow growing bone tumour with predominance in long bones, and is rare in the skull. They are a very rare present in the mastoid temporal bone, being usually asymptomatic for long time and treated mainly for cosmetic reasons. This is a retrospective study of the clinical presentation, management and complications of temporal bone osteoma done from April 2015 to may 2019. The study population is twelve patients, all who has been radiologically and histopathologically proven to be entire case of osteoma. Out of the 12 patients, 7 were females and the rest 5 were males. All cases had swelling behind the ear, impairment of hearing in 1 case and 6 cases had pain over swelling. The duration of symptoms ranged from 8 months to 6 years. Out of total 12 patients 1 case had mastoid region involvement along with extension to external auditory canal. The surgical excisions depend on the symptoms, size of tumor, and its complication All Patient underwent complete excision of the tumour and then the bone at margin and base was drilled with a diamond burr to remove the mass completely without any significant complication. The entire specimen was sent for histopathological examination and diagnosis of osteoma was confirmed. The clinical presentation and radiological features of osteoma are characteristic but differential diagnosis should include eosinophilic granuloma, giant cell tumour, monostotic fibrous dysplasia, solitary variant of multiple osteoma, and osteoblastic metastasis. Osteomas present on the mastoid or squamous portion of the temporal bone need to be dealt for cosmetic purposes or if they are causing symptoms, while surgery should include careful removal of periosteal cover and safe margin of the mastoid cortex around it.

Keywords: Mastoid temporal bone; Postaural swelling Temporal bone tumours; Osteoma.

Introduction

Osteomas are osteoblastic mesenchymal tumour composed of well-differentiated mature osseous tissue with a laminar structure. Osteoma of the temporal bone is a very rare entity with occurrence of 0.1% to 1% of all benign tumors of the head. They have been reported in all portions of the temporal bone, including mastoid, squama, middle ear, internal and external auditory meatus, Eustachian tube, petrous apex, styloid process and glenoid cavity. Computer tomography is the gold standard for diagnosis. Surgical excision is the treatment of choice depending on its extension in the temporal bone and related structures.

Materials and Methods

This is a retrospective study was conducted from April 2015 to May 2019 after informed consent was obtained from all 12 patients in tertiary rural referral center between the age from 14 years to 46 years. The complete Clinical examination, Otoscopic, tuning forks test, and radiological evaluation were done in all patients. Hearing assessments were done by manual pure tone audiometry for all patients. After the complete evaluation, all the patients underwent complete surgical excision without complications. All patients were regularly followed up from 4 months to 05 years and no recurrences were observed. Natures of diseases pathology were explained to all patients.

Observation and Results

Out of the 12 patients, 7 were females and the rest 5 were males. 07 patients were involved on right side post auricular swelling and 05 patients were involved left side. All cases had swelling behind the ear, impairment of hearing in 1 case and 6 cases had pain over swelling. The duration of symptoms ranged from 08 months to 6 years. All patients had mastoid region involvement but one had extension to external auditory canal which is developed mild conductive type hearing loss (Table 1).

Table 1:

Sl. No.	Age in years	Sex	Swelling behind Ear	Pain over Swelling	Hearing of Impairement	Duration of Symptoms	Site of Lesions
1.	15	M	Yes	No	No	08 months	Left
2.	20	F	Yes	Yes	No	02 years	Right
3.	14	F	Yes	No	No	11 months	Right
4.	21	F	Yes	No	No	03 years	Right
5.	32	F	Yes	Yes	No	02 years and 6 months	Left
6.	22	M	Yes	Yes	No	03 years	Right
7.	34	M	Yes	No	No	04 years and 08 months	Left
8.	46	M	Yes	Yes	Yes	06 years	Right
9.	21	F	Yes	No	No	01 years	Right
10.	28	F	Yes	Yes	No	04 years	Right
11.	37	M	Yes	No	No	05 years and 04 months	Left
12.	16	F	Yes	Yes	No	01 years and 06 Months	Left

All the post auricular Swelling was gradually increasing in size and shape. There was no history of trauma, headache, dizziness, ear discharge and facial nerve palsy. Clinical examination of all the patient revealed a solitary immobile spherical to oval shape swelling, which was non tender, smooth surfaced, with well-defined margins. Swelling was bony hard in consistency; skin over swelling was normal and no sign of inflammation. One patient has developed external auditory canal obstruction and mild conductive type hearing loss, rest of the otologic examination, audiometric evaluation and routine laboratory investigations were normal. Some picture show in pre operative, interaoperative and post operative of osteoma of temporal bone (Figs. 1-4).

Fig. 1: Preoperative Pictures Picture 1 Picture 2

Fig. 2: Interaoperative Pictures Picture 1 Picture 2

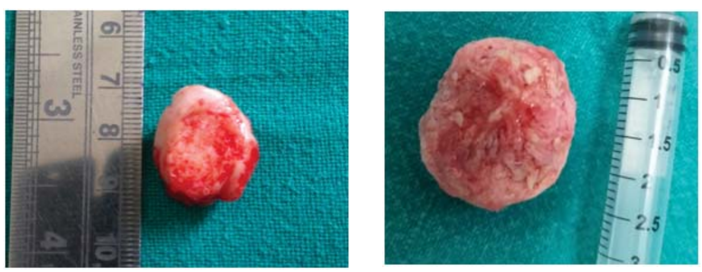

Fig. 3: Postoperative specimens Specimen 1 Specimen 2

Fig. 4: Postoperative Picture

All high resolution computed tomography (HRCT) temporal bone show a well demarcated sclerotic mass in mastoid part of temporal bone which were originating from outer table of the skull with no evidence of destruction of the inner table or intracranial extension. The surgical excisions depend on the symptoms, size of tumor, and its complication. All Patient underwent complete excision of the tumours and then the bone margin and base was drilled with a diamond burr to remove the mass completely without any significant complication. There was no recurrence on regular follow up from 04 months to 04 years. All the patients had been proven by radio logically and histopathologically and confirmed as osteoma. (Fig. 5).

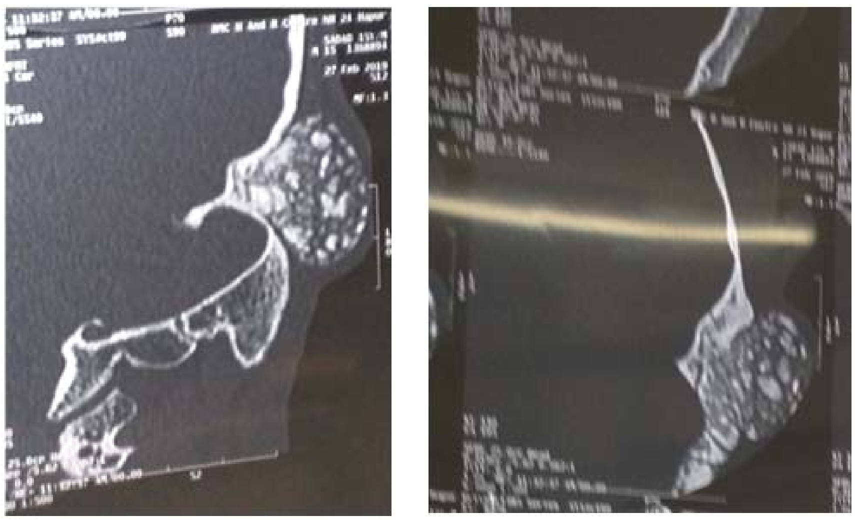

Fig. 5: High Resolution Computed Tomography (HRCT) Temporal Bone

Discussion

Osteoid osteoma being a primary bone tumor accounting for 10% of all primary bone tumors mostly occurs in long bones. Osteomas are essentially benign osteoblastic tumours of mesenchymal origin. Osteomas of the skull base are commonly found in the frontal and ethmoidal sinuses. Other occurrences include the sphenoid and maxillary sinuses, area of the mandible and rarely the temporal bone. Temporal bone osteomas are very rare that only 137 cases have been reported in the literature.[12] Within the temporal bone, osteomas are most commonly reported in the mastoid bone, external auditory meatus, middle ear, along the auditory canal, styloid process, temporomandibular joint, apex of the petrous temporal bone, internal auditory canal and rarely in the mastoid.[11,12,18,20,22] Mastoid osteoma as discussed in this literature has the incidence of 0.1–1% of all head and neck benign tumours.[8] As in our research study of the 12 patients, mastoid osteoma of temporal bone has a higher incidence in females between the ages 20 to 30 years old.

The exact origin of osteoid osteoma has not been identified as yet. According to Haymann, osteomas were a result of alteration in the growth of the cranial bones. Freidberg postulated, it occurred as a result of trauma which induced periostitis.[25] Its occurrence may be divided into syndromic and nonsyndromic. Gardener's syndrome for example comprises of multiple intestinal polyps, mesentery and skin fibromas, epidermoid inclusion cysts and osteomas with a predilection for membranous bones such as maxilla and mandible.[8] Osteomas which are of nonsyndromic origin have several possible contributing factors to its pathogenesis which include trauma, inflammation, metaplasia, surgery, irradiation, chronic infection, pituitary dysfunction and genetics.[5]

Histologically three types of mastoid osteomas have been described, based on structural characteristics.[16,21]

Compact: The most common type. It consists of dense, compact and lamellar bone, with few vessels and Haversian canal systems within. Those with dense sclerotic bone are called ivory osteoma.

Compact osteomas are slow growing with a wide base as opposed to cancellous osteomas which grow rapidly in peduncles.[5]

***Cartilaginous**:* Comprising bony and cartilaginous elements

Spongy:

Rare type. Comprised of spongy bone and fibrous cell tissue, with tendency to expand to the diploe and involving the internal and external lamina of the affected bone. These have bone marrow and are also known as cancellous osteomas. They are more likely to be pedunculated and grow relatively faster.

Mixed: Mixture of spongy and compact types.[21]

Osteomas are chiefly mature bone. Macroscopically, it can be seen as a zone of distinct homogenous hyperostosis with features of dense lamellar bone growing centrifugally without any mass effect. Microscopically, a sclerotic, dense lamellar bone with organized Harvesian canals can be seen.[19] Osteoblasts, fibroblasts and giant cells with no hematopoietic cells make up the intratrabecular stroma.

Mastoid osteomas are usually asymptomatic and stable over many years.[13] Their size when diagnosed is usually less than 3 cm. Generally, their growth progresses extra cranially which can be seen as a smooth swelling, bony hard in consistency. Large swellings are unsightly and may sometimes irregular in shape. skin over swelling are mostly appears to be normal and no sign of inflammation. Rarely osteoma may cause pain or inflammation.[14] Pain occurs when the osteoma breaches the inner table of the temporal bone and maybe confined to the ear, tympanic membrane or neck. Pain may be due to irritation of great auricular or small occipital nerves in the neck region. Conducting type of hearing loss develops due to the obstruction of external ear canal wall by the osteoma. Occlusions of the external ear canal may cause the hearing loss.[7,10] In our study, one patient show mild conductive hearing loss other has normal hearing. All The types are difficult to distinguish on clinical grounds due to parallel symptoms and objective signs

These tumours are usually asymptomatic and are unsuspected X-ray findings, except for cortical lesions that are seen initially as cosmetic deformities.[9] The main presenting complaint is headache, and is usually out of proportion to the size of the tumor. Pain is the other main presenting symptom of osteoid osteoma, which increases in the night and is relieved by salicylates and other NSAID. The lack of pain in osteoid osteoma has been reported in only 1.6% in a large review and was attributed to the lack of a hard shell or nerve endings around the lesion

Non contrast computer tomography is superior to magnetic resonance imaging and is considered as the modality of choice. On the computed tomography, osteoid osteoma typically demonstrates fusiform sclerotic cortical thickening in the mastoid temporal bone.[4] A characteristic radiolucent area measuring <1 cm in diameter and representing the lesion itself is usually within the centre of the area of sclerosis and harbors central calcification in approximately 50% cases.[17]

Osteoma can be seen as a rounded to oval shape bone lesion on the mastoid outer cortex, distinctive margins with sessile or pedunculated base. Mastoid air cells remain aerated in superficial lesions. Rarely, osteomas may extend into the petrous part of the temporal bone adjacent to the horizontal semicircular canal, ossicles and facial nerve.[4,11] In such cases, imaging is indispensable to define relations to these structures prior to resection.

Differential diagnosis of mastoid osteoma includes ossifying fibroma, osteoid osteoma, osteoblastic metastasis, osteosarcoma, isolated eosinophilic granuloma, Paget's disease, giant cell tumour, calcified meningioma, hemangioma, and monostotic fibrous dysplasia.[5] These lesions however are less demarcated in comparison to mastoid osteoma and usually distinguished by radiological and anatomical pathology study. Heterogeneous, poorly delineated lesions with rapid growth suggest malignancy.

Asymptomatic patients can be regular followed up with observation and monitored with regular imaging. When symptoms such as conductive hearing loss, recurrent ear infection due to auditory canal occlusion or intolerable disfigurement are present, surgical resection is the treatment of choice.[15,24] According to Guerin and colleagues, the early surgical intervention has been indicated to prevent voluminous growth and possible risk of complications in the surgical procedure.[19] Mastoid and squamous superficial lesions are excised and drilled until normal underlying bone is exposed. During this excision, periosteal covering and safe margin of the mastoid cortex are removed. If it is close to important structures such as the facial nerve canal or bony labyrinth, a subtotal excision is adopted to preserve function. Complete excision of mass and diamond drilled of surrounding mastoids results in excellent outcome and rare recurrence.[1,2] Malignant transformation is not yet to be reported in literature.[23]

Surgical complications of osteoma are very rare. However patients with extensive tumour or one with middle ear extensions may develop sensorineural hearing loss due to the drilling of the temporal bone. Patient is also at risk of ophthalmologic complications such as reduced vision and papilloedema due to sigmoid sinus damage when removing a tumour which has extended towards the posterior cranial fossa. In such cases, aggressive postoperative medical therapy including steroids and intravenous antibiotics can achieve good recovery. In our study, the surgery was uneventful, devoid of postoperative complications and the patient achieved good cosmetic outcome.

Conclusion

Mastoid osteoma is a rare slow growing benign tumour of the head and neck. Usually asymptomatic with unsightly disfigurement, it may also present with symptoms of ear occlusion. Computer tomography is the investigation of choice of osteoma. Surgical excision of the tumours and the bone margin and base was drilled with a diamond burr to remove the mass completely without any significant complication. Overall, in our study show complete resection, no recurrence after regular follow up and patient achieves good cosmetic results.

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References

1. Jeong J, Choi YJ, Hong CE, *et al*. Giant Osteoma in the Mastoid of the Temporal bone. Otology & Neurology. 2018:39:894-96.
2. Gowri Sanker M, Somath BM, Gadag RP, *et al*. Osteoma of the mastoid Temporal bone Int. J. Otorhinolaryngology Head Neck Surgery. 2018–4:1097–1100.
3. RK Singh, A Goyal, A Kumar, *et al*. Mastoid Osteoma of Temporal Bone: A Rare Case report. J Clin Diagn Res. 2017 Jun;11(6):MD01–MD02.
4. Parashari UC, Khanduri S, Singh N, *et al*. Mastoid osteoma. Indian J Otol. 2014;20132–13.
5. Parelkar K, Thorawade V, Jagade M, *et al*. Osteoma of temporal bone—a rare case report. Int. J Otolaryngol Head Neck Surg. 2014;3:252–58.
6. Ahmadi MS, Ahmadi M, *et al*. Osteoid osteoma presenting as a painful solitary skull lesion: a case report. Egyptian Society of Ear, Nose, Throat Iran J. Otorhinolaryngology. 2014 Apr;26(75):115–18.
7. Cheng J, Garcia R, Smouha E. Mastoid osteoma: a case report and review of the literature. Ear Nose Throat J. 2013 March;92(3):E7.
8. Smud D, Augustin G, Kekez T, *et al*. Gardner's Syndrome: Genetic Testing and Colonoscopy Are Indicated in Adolescents and Young Adults with Cranial Osteomas: A Case Report. World Journal of Gastroenterology. 2007;13:3900–3903.
9. Park SJ, Kim YH. A case of giant osteoma developed from the mastoid cortical bone. Korean J Audiol. 2012;16:95–98.
10. Mustafa A. Osteoma of mastoid process obstructing external auditory canal: a case report. Health. 2012;4:222–24.
11. Fakiri MEl, Bakkouri WEl, Halimi C, *et al*. Mastoid osteoma: report of two cases. Eur. Ann Otorhinolaryngology Head Neck Dis. 2011;128 2011:266–68.
12. Domínguez Pérez AD, Rodríguez Romero R, Domínguez Durán E, *et al*. The mastoid osteoma, an incidental feature? Acta Otorrinolaringol Esp. 2011;62:140–143.
13. Pereira CU, Feitosa de Carvalho RW, Gomes de Almeid AMa, *et al*. Mastoid osteoma. Consideration on two cases and literature review. Int. Arch Otorhinolaryngology São Paul. 2009;13(3):350–53.
14. Gulia J, Yadav S. Mastoid osteoma:a case report. Internet J HeadNeck Surg. 2008;3(1):453-457.
15. Patrícia M.S. Takenaka, Filomena R.P. Perez, Sandra J. Patrocínio, *et al.* Mastoid osteoma: report of a case and literature review. Bras J Otolaryngol. 2004 Nov-Dec;70(6).
16. Varshney S. Osteoma of temporal bone. Indian J Otol. 2001;7:91
17. Singh I, Agarwal AK, Agarwal S, *et al*. Giant osteoma of the mastoid bone. Indian J Otol. 1999;5:97–8.
18. D'Ottvai LR, Piccirillo E, De Sanctis S, *et al*. Mastoid osteomas: review of the literature and presentation of two clinical cases. Acta Otorrinolaringol Ital. 1997;17:136–9.
19. Guérin N, Chauveau E, Julien M, *et al*. Osteoma of the mastoid bone: report of two cases. Laryngol Otol Rhinol. 1996;117:127–32.
20. Burton DM, Gonzalez C. Mastoid osteomas. Ear Nose Throat J. 1991;70:161–2.
21. Probost LE, Shanken L, Fox R. Osteoma of the mastoid bone. J Otolaryngol. 1991;20:228–30.

22. Gil Tutor E. Osteoma of the mastoid. Case report. An Otorrinolaringol Ibero Am. 1991;18:325–30.
23. Van Dellen JR. A mastoid osteoma is causing intracranial complications: a case report. S Afr Med J. 1977;51:597–8.
24. Gupta OC, Somnath IC. Osteoma of the mastoid Bon. Laryngoscope 1972; 82:172–6.
25. Friedberg SA. Osteoma of Mastoid Process. Arch Otolaryngology Head Neck Surg. 1938;28:20–6.

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Review Article

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Mobile Phone and Auditory Effects? Time to Think

Saurabh Varshney[1], Prateek Varshney[2]

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Abstract

Today this is difficult to think a life without a mobile. Mobile phone use has increased dramatically since its introduction in the early-to-mid 1980's. In the last 20 years, worldwide mobile phone subscriptions have increased from 12.4 million to over 5.6 billion, involving about 70% of the global population. India holds second position with about 885 million users, that is, 74% of Indian population. Mobile phone emits electromagnetic radiation in the microwave range around 2.5 GHz range and health concerns have been raised. On May 31, 2011 the WHO International Agency for Research on Cancer (IARC) categorized the radiation fields from mobile phones, and from other devices that emit similar non-ionizing electromagnetic fields (EMFs), as a Group 2B i.e., a 'possible' human carcinogen. When the mobile is in use, all the components of the auditory system including the skin, external and middle ear, the inner ear, cochlear nerve and the temporal lobe surface absorb the radiofrequency energy. The widespread use of mobile phones in recent years has given rise to concerns about the potential influences of its electromagnetic fields (EMFs) on human ear. Little attention has been paid to the effects of electromagnetic field (EMF) of mobile phones on hearing.

Keywords: Electromagnetic fields (EMFs); Mobile, Auditory Effect, Hearing.

Introduction

Mobile phone use has increased dramatically since its introduction in the early-to-mid 1980's. Mobile phone usage is over 5.6 billion worldwide. In the last 20 years, worldwide mobile phone subscriptions have increased from 12.4 million to over 5.6 billion, involving about 70% of the global population.[1] India holds second position with about 885 million users, that is, 74% of Indian population (November 2011).

Mobile telephones are now an integral part of modern telecommunications. Mobile phone radiation and health concerns have been raised, especially following the enormous increase in the use of wireless mobile telephony throughout the world. This is because cell phones use Electromagnetic radiation in the microwave range around 2.5 GHz range. These concerns have induced a large body of research in animals and in humans. In the late 1990s, several expert groups critically reviewed the evidence on health effects of low-level exposure to radiofrequency (RF) electromagnetic fields, and recommended research into the possible adverse health effects of mobile telephone use. On May 31, 2011 the WHO International Agency for Research on Cancer (IARC) categorized the radiation fields from mobile phones, and from other devices that emit similar non-ionizing electromagnetic fields (EMFs), as a Group 2B i.e., a 'possible' human carcinogen. The widespread use of mobile phones in recent years has given rise to concerns about the potential influences of its electromagnetic fields (EMFs) on human ear. Little attention has beepaid to the effects of electromagnetic field (EMF) of mobile phones on hearing. A review of literature failed to prove conclusively the prolonged mobile phone use effect on auditory function. Various studies conducted had contradictory results.

Mobile phones have become indispensable as communication tools; however, to date there is only a limited knowledge about interaction between electromagnetic fields (EMF) emitted by mobile phones and auditory function.[2] A review of literature failed to prove conclusively the prolonged mobile phone use effect on auditory function. Various studies conducted had contradictory results. The reported effects associated with exposure to mobile phones on the auditory system did not show a consistent pattern. With the recent popularity of mobile phone use among the young people and children, and therefore potentially longer lifetime exposure, further studies are required to fill the gaps in the knowledge regarding harmful effects of EMFs from mobile phones on ear.

Mobile phones are two way radios that transmit and receive information via radio waves also known as radiofrequency (RF) energy. Global system for mobile (GSM) communications is the world's most popular standard for mobile telephony systems. GSM networks operate in a number of different carrier frequency, with most 2G GSM networks operating in the 900 MHz or 1800 MHz bands and most 3G networks operate in 2100 MHz. CDMA 2000 (Code Division Multiple Access) is the other popular technology standard which uses CDMA channel access, CDMA uses frequencies from 824 MHz to 894 MHz. These frequencies fall in the microwave range of the electromagnetic spectrum. In India mobile phones operate in the frequency range of:[3]

- 869–890 MHz (CDMA)
- 935–960 MHz (GSM900)
- 1805–1880 MHz (GSM1800)
- 2110–2170 MHz (3G).

In contrast to ionizing radiation, electromagnetic fields emitted from cellular telephones do not have enough energy to break chemical bonds or damage DNA. Electromagnetic radiation from a cell phone can penetrate the skull and deposit energy 4–6 cm into the brain. This can potentially result in a heating of the tissue of up to 0.1° C.[4] Therefore, it has been debated whether these fields could damage the tissue or not. The radio waves emitted by a GSM handset can have a peak power of 2 W, and a US analogue phone had a maximum transmit power of 3.6 W. Other digital mobile technologies, such as CDMA2000 use lower output power, typically below 1 W.

The use of mobile telephones transmit and receive microwave radiation at frequencies of about 900 Megahertz (MHz) and 1800 MHz and these frequencies excite the rotations of the water and some organic molecules and have been attributed to thermal and non-thermal effects. The widespread use of mobile telephones has given rise to the question of whether the EMFs created by mobile telephones is detrimental to the hearing of their users. Mobile telephone use necessitates to hold in close proximity with the ear, and so far it has not been reported as a cause of hearing loss in the literature.[2]

While using cell phone for talking or being connected to someone the user gets exposed to harmful electro magnetic radiations. The exposure rate to these radiations vary from handset to handset. When cell phones are used in close proximity to human body, the radiations emitted from cell phones penetrate deep inside the human skin. Penetrated radiations produce induced electric field inside the body, resulting in absorption of power, which can be analyzed using a parameter called specific absorption rate (SAR). But still one question arises in mind that are people really aware of Safety standard especially SAR value. What does SAR value mean? It's the specific absorption ratio measure of amount of radio frequency intensity or energy absorbed by body while connected on cellular network. It is defined as the power absorbed per mass of tissue and has units of watts per kilogram (W/kg) and in a way defines safety range of mobile handset. SAR provides little information about the biological consequences unless the amount of energy absorbed is known. SAR is usually averaged either over the whole body, or over a small sample volume (typically 1 g or 10 g of tissue). The value cited is then the maximum level measured in the body part studied over the stated volume or mass. The maximum power output from a mobile phone is regulated by the mobile phone standard and by the regulatory agencies in each country.[5]

International Commission on Non-Ionising Radiation Protection (ICNIRP) is a body of independent scientific experts established with an aim to provide information and insight into the potential health hazards of exposure to non-ionising radiation. According to ICNIRP guidelines for limiting exposure to time varying electric, magnetic and electromagnetic fields, the maximum SAR value for mobile phones has been set at 2 W/kg localized for the head and the trunk (of a human) in the frequency range of 10 MHz to 10 GHz. It means in countries such as India where these guidelines are adopted, the specific absorption rate (SAR) of every mobile phone sold in the country should be less than 2 W/kg. In India, the SAR limit prescribed for cell phones is 1.6 W/Kg averaged over one gram of human tissue.[3]

There are two direct ways by which exposure to radio frequency radiations can affect health. These are thermal effects caused by holding mobile phones close to the body and possible non-thermal effects.[6] Electromagnetic radiation from a cell phone can penetrate the skull and deposit energy 4-6 cm into the brain. This can potentially result in a heating of the tissue of up to 0.1° C.[4] The non-thermal effects include electrical force induction and possibly an increase in heat shock protein synthesis in cells. Continuous heat shock protein synthesis may be involved in oncogenesis, by inhibiting cell apoptosis. Low-energy EMFs seem to cause structural and functional changes in the cell membrane of different cell types, leading to abnormal cell response. Various studies suggest that EMR directly affects neurons by reducing the neuronal reactivity, increasing the neural membrane conductivity and prolonging their refractory period. Thus, the auditory system, the cochlea and the auditory (VIII) nerve which directly receive EMF during mobile phone use are particularly at risk and therefore should be studied for any changes resulting from the thermal and non-thermal effects of EMF.[3] Electromagnetic field (EMF) radiations may cause adverse health problems such as headache, sleep disorders, impairment of memory, lack of concentration, dizziness, increased frequency of seizures in epileptic children, brain tumours and high blood pressure.[6] Sensations of burning or warmth around the ear, head ache, disturbance of sleep, alteration of cognitive functions and neural activity as well as alteration of blood brain barrier and relative decrease in cerebral blood flow have been reported as effects of mobile phone use.[3]

Many scientific studies have investigated possible health effects of mobile phone radiations. Exposure to electromagnetic fields has been linked to different forms of cancer[7–11] (e.g., lymphoma, brain tumors, leukemia), various neurological disease (Alzheimer›s disease), sleep disturbances,[12,13] and genotoxic effects.[13] Telecommunications systems emit radiofrequency, which is an invisible electromagnetic radiation. Mobile phones operate with microwaves very close to the users ear. The skin, inner ear, cochlear nerve and the temporal lobe surface absorb the radiofrequency energy.[14] The electromagnetic fields emitted from mobile can penetrate skull and deposit energy 4–6 cm into the brain resulting in heating of the tissue. There is general concern regarding the possible hazardous health effects of exposure to radiofrequency electromagnetic radiation emitted from mobile phones. Handsets are held against the head while a call is made. Typically, the distance from the antenna to the head is only about 2 cm or less. The skin, inner ear, VIII nerve and the temporal lobe surface absorb the radiofrequency energy.When the mobile is in use, all the components of the auditory system including the skin, external and middle ear, the inner ear, cochlear nerve and the temporal lobe surface absorb the radiofrequency energy. Also the outer hair cells in the cochlea are known to be highly sensitive to a great variety of exogenous and endogenous agents including externally applied electrical and magnetic fields.[3] The mobile phone is used by bringing it close to the ear which increases the specific absorption rate (SAR) of EMFs by the brain which may affect the auditory system. The absorption of mobile phone's radiofrequency (RF) output power energy in the users head may be as high as 40–55%.[15]

Most of the studies on auditory effects of mobile phones have investigated only the short term effect of mobile phone handset EMF radiation on the auditory system and the result obtained did not reveal any information regarding the potential effects of longer exposure or chronic cumulative exposure. A review of recent studies on the possible effects of mobile phone signals on the auditory system found that mobile phone use can affect the hearing function of users according to the duration of use. Short-term exposure at the maximum output of consumer mobile phones does not cause measurable immediate effects on the human auditory system, whereas longterm (more than 1 year) and intensive mobile phone use may cause inner-ear damage and can lead to high-frequency hearing loss.[16–20] Almost all studies recommend further studies in larger population over a longer time. However, the limited data can result in the misinterpretation of results or in the inappropriate extrapolation of scientific findings.[3]

Considering that the use of cell phones by children and adolescents, has been increasing in recent years and also with the onset of use starting very early in life, children will have a longer lifetime exposure than adults. However, only a few relevant epidemiological or laboratory studies have addressed the possible effects of cell phone exposure on children.[21]

Little attention has been paid to the effects of electromagnetic field (EMF) of mobile phones on hearing and there are contradictory reports regarding it in literature. Mobile phone usage is widespread and concerns have been raised on the safety of its long-term usage. Since ear is the closest organ to mobile phones receiving higher energy deposition than other organs, the effects of mobile phone radiation on hearing has been debated.[14,22] The widespread use of mobile phone has given rise to genuine concern regarding the potential influences of electromagnetic fields (EMFs) on human health.[23]

Conclusion

As uncertainty prevails concerning theauditory effects of cell phones, precautionary measures are best adopted by all concerned parties, namely governments, mobile companies, and the public and further research is required in the field.

References

1. World Health Organization. Electromagnetic fields and public health: mobile phones. 2011; Fact sheet No.193.
2. Ozturan O1, Erdem T, Miman MC, *et al*. Effects of the electromagnetic field of mobile telephones on hearing. ActaOtolaryngol. 2002 Apr;122(3):289–93.
3. Dabholkar YG, Pusalkar AG, Velankar HK. Effects of cell phone EMF radiations on the auditory system- a review. Int J Health Sci Res. 2016;6(1):506–15.
4. Sahoo GC, Sebastian H. Prevalence of sensorineural deafness in habitual mobile phone users. Indian J Otol. 2011;17:97–100.
5. Varshney S, Malhotra M, Sharma S, *et al*. Specific Absorption Rate (SAR) value of mobile phones: An awareness study among mobile users. Indian J Community Health. 2018 June 30;30(2):156–12. Available from: https://www.iapsmupuk.org/journal/index.php/IJCH/article/view/826
6. Michael M, Colin B, Mika K. The health hazards of mobile phones. Br Med J. 2000;320:1288–89.
7. Myung SK, Ju W, McDonnell DD, *et al*. Mobile phone use and risk of tumours: A meta analysis. J ClinOncol. 2009;27:5565-72.
8. Hardell L, Carlberg M, Hansson Mild K. Use of cellular phones and brain tumours, risk of urban and rural areas. Occup Med. 2005;62:390–94.
9. Schoemaker MJ, Swerdlow AJ, Ahlbom A, *et al*. Mobile phone use and risk of acoustic neuroma; results of the interphone case control study in five North European countries. Br J Cancer. 2005;93:842–8.
10. Hardell L, Carlberg M, Mild KH. Case control study of the association between the use of cellular and cordless telephones and malignant brain tumours diagnosed during 2000–2003. Environ Res. 2006;100:232–41.
11. Kundi M. The controversy about a possible relationship between mobile phone use and cancer. Environ Health Prospect. 2009;117:316–24.
12. Thomée S, Härenstam A, Hagberg M. Mobile phone use and stress, sleep disturbances, and symptoms of depression among young adults-a prospective cohort study. BMC Public Health. 2011;11:66
13. Babyrani Devi S, Kamble RK. Cellphone radiofrequency radiation- A potential health hazard. Carmelight. 2010;7:97–108.
14. Balbani AP, Montovani JC. Mobilephones: Influence on auditory and vestibular systems. Braz J Otorhinolaryngol. 2008;74:125–31
15. Gandhi OP. Electromagnetic fields: human safety issues. Annu Rev Biomed Eng. 2002;4:211–34.
16. Stefanics G, Kellenyi L, Molnar F, *et al*. Short

GSM mobile phone exposure does not alter human auditory brainstem response. BMC Public Health. 2007;7:325

17. Mora R, Crippa B, Mora F, *et al*. A study of the effects of cellular telephone microwave radiation on the auditory system in healthy men. Ear Nose Throat J. 2006;85:160,162–3.
18. Kwon MS, Jääskeläinen SK, Toivo T, *et al*. No effects of mobile phone electromagnetic field on auditory brainstem response. Bioelectromagnetics. 2010;31:48–55
19. Panda NK, Jain R, Bakshi J, *et al*. Audiologic disturbances in long-term mobile phone users. J Otolaryngol Head Neck Surg/ 2010;39(1):5–11.
20. Bhagat S, Varshney S, Bist SS, *et al*. Effects of chronic exposure of electromagnetic fields from mobile phones on auditory function. Ear Nose Throat J. 2016 Aug;95(8):E18–22.
21. Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR). Possible effects of electromagnetic fields (EMF) on human health. Brussels, Belgium: European Commission; 2007
22. Hardell L, Mild KH, Carlberg M. Further aspects on cellular and cordless telephones and brain tumours. Int J Oncol. 2003;22:399–407
23. Bhagat S, Varshney S, Bist S, *et al*: Effects Of Chronic Exposure To Mobile Phones Electromagnetic Fields On Inner Ear. The Internet Journal of Otorhinolaryngology. 2012; 14(2):1-6.

Case Report

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Unusual Anteriorly Placed Sigmoid Sinus: A Rare Case Report from Uttarakhand (India)

Shubhankur Gupta[1], Manu Malhotra[2], Madhupriya[3], Abhishek Bharadwaj[4], Saurabh Varshney[5], Amit Tyagi[6], Amit Kumar[7]

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Abstract

The location of the sigmoid sinus within the mastoid cavity can be variable. An anteriorly displaced vertical segment of the sigmoid sinus constitutes an uncommon but potentially dangerous anatomical variation that surgeons can encounter during surgery. In this, the sigmoid sinus lays underneath a very thin bony flap, which can be easily damaged. Thus, an abrupt bleeding might occur. We present a case where the vertical segment of the left sigmoid sinus was encountered just underneath the posterior wall of the external auditory canal during evaluation of a case of COM. Anatomical variations of the sigmoid sinus are not uncommon, and the otolaryngologist should be aware of such variations to prevent intra- operative surprises.

Keywords: Sigmoid sinus; Abnormally displaced; Anterior course; Anatomical variation.

Introduction

The sigmoid sinus is a venous space between the endosteum of the occipital bone and the dura. It possesses an endothelium lining without valves or muscle in its walls.[1] The sigmoid sinus originates at the junction of the transverse and the superior petrosal sinuses at the superior border of the petrous bone. From this point it changes direction in the vertical plane toward the medial portion of the mastoid cavity carving a deep canal in an S form and terminates anteriorly at the jugular bulb. The sino-dural angle is formed at the junction of the sigmoid sinus and superior petrosal sinus. The sigmoid sinus forms the posterior limit of Trautmann's triangle.

The location of the sigmoid sinus within the mastoid cavity is quite variable, and thus impacts surgical planning and execution profoundly. An anterior location of the sinus will limit access to the internal auditory canal via a translabyrinthine approach.[2] Also, an anterior or a medial location of the sigmoid sinus limits access to the endolymphatic sac near the posterior semicircular canal.[3] Thus, an anteriorly-displaced vertical segment of the sigmoid sinus is an important anatomical variation that triggered a debate about its causality.[4] Some studies showed that the distance between the sigmoid sinus and the posterior wall of the external auditory canal is significantly smaller in patients with sclerotic mastoids due to chronic otitis media (COM) in childhood, or genetic factors that provoke mastoid hypopneumatization,[5] while other studies refuted this claim, and hypothesized that volume reduction may result from the sclerotic change in the air cell system, rather than from shrinkage of the mastoid bone, and even suggested that the sinus location is responsible for decreasing the mastoid pneumatization.[6]

This variation has been scarcely reported during surgery nevertheless, it might easily provoke a massive bleeding if the surgeon didn't take caution to the abnormal sinus that lies underneath a thin bony flap. The anteriorly-displaced sinus is a well-defined anomaly in high resolution computed tomography imaging (HRCT). We report a case where the sigmoid sinus was seen in HRCT just underneath the posterior wall of EAC, which led to a change in our surgical approach.

Case Report

A 31 year-old female patient presented to our OPD clinic with bilateral ear discharge and decreased hearing since childhood. On otoscopy, a posterosuperior retraction pocket with a central perforation was seen in left ear, the fundus of retraction pocket was not visible (Grade–IV). In right ear, a central perforation was seen. 35 dB air-bone gap was seen in both ears. A high-resolution CT scan of temporal bone was planned, which suggested a soft tissue density in the left mastoid air cells, aditus, middle ear cavity and antrum. However on observing the scan on console, surprisingly, the vertical segment of the left sigmoid sinus was abnormally anteriorly displaced, almost dehiscent to the posterior wall of EAC, which was actually mimicking as soft tissue density in antrum on CT films provided to us (Fig. 1). A change in surgical approach was planned and an inside out approach was taken due to the anteriorly placed sigmoid sinus. During surgery, retraction pocket was removed, malleus and incus were eroded and autologous umbrella PORP and ossicular reconstruction (using cortical bone) was undertaken with Type III b tympanoplasty.

Fig 1: HRCT Temporal bone showing anteriorly placed sigmoid sinus on left side

Discussion

High-resolution temporal bone CT imaging has become a key investigation in the management of ear disorders. Although the primary responsibility of reporting on CT images lies with a head and neck radiologist, it is nevertheless important for the practising otologist to be aware of common anatomical variants and their clinical relevance. An anterior course of the sigmoid sinus is a rare anatomical variation that has been reported in the medical literature. Gangopadhyay *et al*.[7] reported a similar case to ours, as they came upon the sigmoid sinus underneath the skin of the posterior wall of the external auditory canal during an attempted myringoplasty, while Ulug and colleagues[8] confronted massive bleeding from an anteriorly-displaced sigmoid sinus during stapedectomy. Moreover, Puraviappan and colleagues[9] discovered the abnormal anterior course of a ruptured sigmoid sinus in a referral case of middle ear and mastoid exploration via post-auricular approach.

An antero-medially displaced sinus has been described in patients with Meniere's disease, the researchers justified this finding as a result of tightened Trautmann's triangle in these patients. Nevertheless, it's not infrequent to catch this same variation in disease- free temporal bone as stated by Sarmiento and colleagues,[4] Ulug and colleagues.[8]

An anteriorly located sigmoid sinus limits the amount of space for a postaural approach to the mastoid antrum. In a series by V. Vishwanathan and MSC Morrissey,[10] 10 patients out of 186 demonstrated no anterosuperior space between most anterior aspect of sigmoid sinus wall and posterior aspect of EAC wall, as in our case. Prior to undertaking mastoidectomy, its important to study the location of sigmoid sinusin order to avoid unnecessary injury. We had to take the inside out approach to reach the aditus and antrum, as no space was left due to anteriorly placed sigmoid sinus.

A study compared the intraoperative data and computed tomography measures of 30 patients and concluded that the tomographic distance between the sigmoid sinus and the external ear canal measuring less than 9 mm complicated the procedure, their lowest distance was 4.7 mm.[11] In our case the distance was almost 6 mm, which could potentially expose the sinus to haemorrhage jeopardy. By using seven reference points, surgical classifications of the location of sigmoid sinus were proposed. Based on the 96 temporal bone dissection performed, they were grouped into 3 types. In Type 1, the location of the sigmoid sinus was posterior, enlarging the Trautmann's triangle. In Type 2 (the most common), the sigmoid sinus was located anteriorly diminishing the size of Trautmann's triangle.[4] In the Type 3, the sigmoid sinus was medially displaced which also reduced the area of Trautmann's triangle. In our case, the sigmoid sinus most probably was the Type 2 in anteroposterior axis but very superficial (lateral) in term of depth.

Conclusion

Anatomical variations related to sigmoid sinus in temporal bone are not uncommon. It is vital for the investigating otologist to be aware of such variations when considering differential diagnoses of temporal bone disorders and also prior to undertaking surgery to prevent unpleasant intraoperative surprises. Furthermore, it is crucial that the investigating radiologist is aware of such variations and flags them as necessary to aid effective patient care.

References

1. Fawcett DW, Jensh RP, Bloom W. Bloom and Fawcett's of histology, 11th ed. Spain: Interamericana McGraw-Hill; 1988. p. 969–93.
2. Lee HK, Lee EH, Lee WS, *et al*. Microsurgical anatomy of the perigeniculate ganglion area as seen from a translabyrinthine approach. Ann Otol Rhinol Laryngol. 2000;109:255-61.
3. Friberg U, Jansson B, Rask-Andersen H, *et al*. Variations insurgical anatomy of the endolymphatic sac. Arch Otolaryngol Head Neck Surg. 1988;114:389–94.
4. Sarmiento PB, Eslait FG. Surgical classification of variations in the anatomyof the sigmoid sinus. Otolaryngol Head Neck Surg. 2004;131(3):192–9.
5. Shatz A, Sade J. Correlation between mastoid pneumatization and position of the lateral sinus. Ann Otol Rhinol laryngol. 1990;99:142–5.
6. Lee D-H, Jung M-K, Yoo Y-H, *et al*. Analysis of unilateral sclerotic temporal bone: how does the sclerosis change the mastoid pneumatization morphologically in the temporal bone? Surg Radiol Anat. 2008;30(3):221–7.
7. Gangopadhyay K, McArthur P, Larsson S. Unusual anterior course of thesigmoid sinus: report of a case and review of the literature. J Laryngol Otol. 1996;110(10):984–6.
8. Ulug T, Basaran B, Minareci O, *et al*. An unusual complication of stapessurgery: profuse bleeding from the anteriorly located sigmoid sinus. EurArch Otorhinol aryngol. 2004;261(7):397–9.
9. Puraviappan P, Prepageran N, Ong CA, *et al*. Anabnormal sigmoid sinus with a dire clinical implication. Ear Nose Throat J. 2014;93(6):E55.
10. Visvanathan V. Anatomical variations of the temporal bone on high resolution computed tomography imaging: how common are they? JLaryngol Otol. 2015;129(07):634–7.
11. Pereira AR, Pinheiro SD, de Castro JDV, *et al*. anatomical parameters x surgical difficulty. Arquivos Internacionais de Otorrinolaringologia. 2012;16(01):057–61.

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Standard journal article

[1] Flink H, Tegelberg Å, Thörn M, Lagerlöf F. Effect of oral iron supplementation on unstimulated salivary flow rate: A randomized, double-blind, placebo-controlled trial. J Oral Pathol Med 2006; 35: 540-7.

[2] Twetman S, Axelsson S, Dahlgren H, Holm AK, Källestål C, Lagerlöf F, *et al*. Caries-preventive effect of fluoride toothpaste: A systematic review. Acta Odontol Scand 2003; 61: 347-55.

Article in supplement or special issue

[3] Fleischer W, Reimer K. Povidone iodine antisepsis. State of the art. Dermatology 1997; 195 Suppl 2: 3-9.

Corporate (collective) author

[4] American Academy of Periodontology. Sonic and ultrasonic scalers in periodontics. J Periodontol 2000; 71: 1792-801.

Unpublished article

[5] Garoushi S, Lassila LV, Tezvergil A, Vallittu PK. Static and fatigue compression test for particulate filler composite resin with fiber-reinforced composite substructure. Dent Mater 2006.

Personal author(s)

[6] Hosmer D, Lemeshow S. Applied logistic regression, 2nd edn. New York: Wiley-Interscience; 2000.

Chapter in book

[7] Nauntofte B, Tenovuo J, Lagerlöf F. Secretion and composition of saliva. In: Fejerskov O,

Kidd EAM, editors. Dental caries: The disease and its clinical management. Oxford: Blackwell Munksgaard; 2003. p. 7-27.

No author given

[8] World Health Organization. Oral health surveys - basic methods, 4th edn. Geneva: World Health Organization; 1997.

Reference from electronic media

[9] National Statistics Online—Trends in suicide by method in England and Wales, 1979-2001. www.statistics.gov.uk/downloads/theme_health/HSQ 20.pdf (accessed Jan 24, 2005): 7-18. Only verified references against the original documents should be cited. Authors are responsible for the accuracy and completeness of their references and for correct text citation. The number of reference should be kept limited to 20 in case of major communications and 10 for short communications.

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