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NEO OSTEOGENESIS IN MASTOID IN PATIENTS OF CHRONIC SUPPURATIVE OTITIS MEDIA: OUR EXPERIENCE

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ABSTRACT

Chronic suppurative otitis media is a pathologically condition characterized by chronic inflammation of middle ear cleft. Neo osteogenesis is a pathological process which in common lingo means formation of new bone. This new bone formation is a rare clinical entity which can often be attributed to inflammatory changes in the bone and surrounding areas. In present study we deal with cases of attico antral type of csom which had neoosteogenesis in the masoid cavity. This study is basically done to document this rare entity, the associated factors for its occurrence and the intra-operative technique, difficulties encountered due to its presence.

KEYWORDS

INTRODUCTION:

Chronic suppurative otitis media is a pathologically condition characterized by chronic inflammation of middle ear cleft. This causes post inflammatory changes in middle ear cleft like tympanic membrane retraction, perforation, atelectasis, sclerosis of mastoid and destruction of bony parts like ossicles, tegmen plate, fallopian canal. Neo osteogenesis is a pathological process which in common lingo means formation of new bone. This new bone formation is a rare clinical entity which can often be attributed to inflammatory changes in the bone and surrounding areas. In present study we deal with cases of attico antral type of csom which had neoosteogenesis in the masoid cavity. This neo osteogenesis was seen both radiologically on hrct temporal bone and intra-operatively. This study is basically done to document this rare entity, the associated factors for its occurrence and the intra-operative technique, difficulties encountered due to its presence.

MATERIALS AND METHOD:

The study was conducted at sola civil hospital and include all cases done from 2017 to 2020. All the patients suffering from chronic suppurative otitis media of attico antral type were included in the study. There was no gender or age criteria defined. All the patients underwent HRCT temporal bone and the ones showing radiological evidence of neoosteogenesis in the mastoid cavity were noted and listed into the study. All the patients underwent mastoid exploration and the ones with confirmatory intra-operative finding of neo osteogenesis were also included in the study.

RESULTS AND OBSERVATION:

Within the given time period of the study there were about 300 patients with attico antral type of COM who were investigated and operated. Of this lot, there were only 5 cases with evidence of neoosteogenesis both radiologically and clinically. Of these 5 patients all were male with mean age of 45 . 5 years. 2 of them had attic perforation with cholesteatoma flakes seen in the attic region and postero superior region with adherent remanant pars tensa. 1 case had a complicate presentation of COM with radiological evidence of eroded tegmen plate and dehiscent sigmoid sinus. The remaining two cases had postero superior bulge on otoscopic finding with a chronically discharging ear. All these patients had long standing disease of chronic otitis media with average duration of 15. 5 years. All of them present to ENT opd with discharging ear and decreased hearing. The discharge was chronically present, intermittent, foul smelling and associated with blood tinged secretions. Pus culture and sensitivity was sent for all patients of COM and it was seen that the patients who presented with neo osteogenesis had their pus culture positive for growth of Pseudomonas aeruginosa. All these patients were planned for mastoid exploration. Intra operative, after drilling of the mastoid cavity it was seen that a tough, brittle yellow white colour bone was encountered in these patients. This bone was present in overlying the mastoid antrum in all the cases and were of variable length and breadth. Their presence in the mastoid cavity presented with degree of difficulty in opening of the mastoid cavity. In 3 cases it gave faulty impression of opening of mastoid antrum, in 1 case the neoosteogenesis was found overlying the sigmoid sinus which was actually dehiscent but could not be appreciated on HRCT temporal bone due to the presence of overlying neo osteogenesis. In the remaining one case the neoosteogensis was seen around the ossicular chain and gave impression of deformed ossicle in HRCT temporal bone. This later case when exposed intraoperatively showed presence of abnormal bone around the incudostapedial joint causing fixation of the same. The presence of neoosteogenensis did not lead to any change in surgical plan on table nor did it cause any grave hindrance to the operating process except for a bit of anatomical distortion. In all the cases, except one with neoosteogenesis at incudo stapedial joint, bone of this neo osteogenesis was drilled out and the planned surgical process was completely executed. All cases were admitted till post operative day 2 after which they were discharged on oral medications, comprising of antibiotics and antihistamines. They were called on post operative day 7 for suture removal and for subsequent follow up at 1st and 3rd month postoperatively. 4 of the 5 patients had gel foam in situ on 7th day postoperatively and at follow up of one month and 3rd month they had their graft taken up with a healthy mastoid cavity.

DISCUSSION:

Neo osteogenesis is defined as new bone formation. This is often a sequel of chronic inflammation which marks the accumulation of inflammatory markers resulting into increase in number of osteoblasts which lay out the new bone. This new bone formed is usually hard and brittle and lacks a definite form. The new bone formed has no definite anatomical location. In our study this neoosteogenesis could also be termed as reactionary osteogenesis , as it happened in response to an ongoing inflammatory process.

In our study, it was seen that all cases with neoosteogenesis had history of long standing ear discharge within range of 15-20 years. The neo osteogenesis was usually seen in mastoid cavity.

The osteogenesis ,as told earlier, is in reaction to an ongoing inflammatory response.(1) this bone reaction mainly aims to contain the pathology and make the environment amenable for repair.in other words it aims to retard the spread of infection. The degree of the osteogenesis depends on the intensity of the pathogenesis, its duration and the immunity of an individual.(2). The sole pathogenesis of the osteogenesis is reabsorption of the existing bone by osteoclasts and later relaying on new and unorganized bone by the activated osteoblasts. The regulatory mechanism is controlled by interaction between RANKL and RANK and between other inflammatory cytokines namely IL-1, 6, 11,17 and macrophage colony stimulatinf=g factor, granulocyte macrophage colony stimulating factor and tumour necrosis factor alpha (3.) Recent literature has also demonstrated role of mesenchyaml stem progenitor cells in osteogenesis.(4).

The middle ear cleft mucosa is a cuboidal epithelium with mastoid cavity having the periosteum underlying the epithelium. The presence of chronic insult in form of infection causes the pathogenesis of neoosteogenesis, a rare yet an important finding. Till date very few cases have been recorded in literature regarding presence of

neoosteogenensis in chronic suppurative otitis media. There are two important factors to be emphasized in this study. First , all these cases had an underlying chronic infection being present for a long duration of minimum 15 years and second all these cases had the Pseudomaonas bacteria as the offending agent . These two hint us that presence of neoosteogenesis(reactional osteogenesis) depends on severity and duration of the infective process.

This neoosteogenesis was purely an incidental finding ,as it itself is clinically asymptomatic. The presence of this abnormal bone can be appreciated only on HRCT temporal bone. This adds to value of pre-operative HRCT temporal bone as an investigation modality in CSOM (5).

Regarding the treatment, the presence or absence of this entity does not make any difference. The problem which was encountered in our surgery was faced mainly in the intra-operative period. Three cases which had neoosteogenesis in the mastoid cavity lead to false identification of antrum. In case where the new bone was covering the sigmoid sinus, the dehiscence could not be appreciated pre-operatively, leading us to be slightly unprepared for the finding of sigmoid dehiscence intra-operatively and hence a little delay in management. The one case which had the new bone surrounding the ossicle was not removed due to danger of damaging the ossicle.

CONCLUSION:

Neoosteogenesis is a rare finding seen in CSOM. It is evident in long standing cases of CSOM. Being an incidental finding it does not cause any new symptoms, but may cause intra-operative troubles. The best diagnostic modality is HRCT temporal bone, which shows a thick radioopaque area in amnd around middle ear cleft.Removal of neoosteogenesis is a part of the surgical management od CSOM, otherwise the neoosteogenesis in itself does not require any active management.

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