



Maxillofacial Surgery

ANTRUM SPARING RESECTION IN MAXILLARY OSSIFYING FIBROMA: A HIGH ALTITUDE CASE REPORT OF A NOVEL TECHNIQUE

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ABSTRACT Ossifying Fibroma falls under the category of Fibro-osseous lesions which present as slow growing, often asymptomatic swellings in tooth bearing anatomical sites of the craniofacial skeleton. The treatment includes resection of pathology which is demarcated and facilitated by shelling out of boundaries from the surrounding unaffected bone, however extremely large lesions in close proximity to anatomical sites like maxillary antrum mandate secondary reconstructive surgeries which can be avoided by our proposed Antrum Sparing resection technique alongwith periodic follow-ups which yield superior results and minimize morbidity especially suited for extreme high altitude regions where surgical procedures and recovery both pose challenges.

KEYWORDS : Ossifying Fibroma, Cementifying fibroma, Maxillary antrum

INTRODUCTION

The pathological entity of Ossifying Fibroma (OF) is a neoplasm that is grouped under benign fibro-osseous lesions alongwith, Fibrous Dysplasia (FD), and cemento-osseous dysplasia, owing to identical clinical presentations and histological resemblance. Replacement of normal bone by fibrous tissue and discernible amounts of new bone and/or cementum-like material is the hallmark of the disease. [1]

OF presents as a painless and slow-growing lesion producing significant expansion in teeth bearing regions of the maxilla and mandible, however lack of perceptible facial swelling till over a prolonged period of time is a common deterrent amongst patients for seeking treatment till oral obliteration due to massive swelling or prosthetic rehabilitation of affected edentulous patients poses a challenge. The diagnosis involves clinical, radiological, histological and even biochemical analysis to rule out overlapping differentials which also aid in decision making for type of surgical procedure warranted for a particular case. Though OF does not exhibit infiltrative patterns however has a high recurrence rate as was described by Eversole et al in their study on 64 cases with a recurrence rate of as high as 28% following surgical curettage. [2] Thus an acceptable healthy margin of 5mm to 1cm is ensured during resection for total disease eradication, however proximity to anatomical structures like maxillary antrum may result in post-operative complications if the antral floor forms a part of resection specimen, thus requiring secondary reconstructive surgical procedures, obturators and splints. The present case report demonstrates a novel technique of Antrum sparing resection in maxillary OF which yielded superior results at out high altitude center.

CASE REPORT



Figure-1: Intra-oral And Extra-oral Patient Photographs

A 54 year old female patient, a native highlander of Leh, reported to our high altitude multispecialty unit for tooth extraction and denture fabrication. On clinical examination, left posterior maxilla revealed a

swelling extending from left paramedian palate across the ridge and obliterating the left maxillary vestibule. Detailed history was recorded which elicited slow growing swelling from past 7 years. Anteriorly, the swelling extended just distal to left maxillary canine and continued posteriorly involving the maxillary tuberosity. Dimensionally the lesion was approximately 4.5 x 4 cm (antero-posteriorly and medio-laterally), was firm, of bony consistency, non-mobile, non-tender with no surface excoriations or hyperemia and root stump of 25 and tooth 28 in situ. There was no bleeding or tenderness congruent with asymptomatic patient history. She had no co-morbidities, oral hygiene was fair, however multiple carious teeth were present. (Figure-1)

Radiological And Histological Examination:

The screening Orthopantomogram (OPG) was carried out and revealed a homogenous hyperdense lesion with a well-defined margins extending from the left alveolar process into the maxillary sinus. To assess the three dimensional spatial orientation of the swelling, Non-Contrast Computed Tomography (NCCT) scan was carried out which revealed a solid hyperdense mass with extensive bone expansion with intact cortex and corticomedullary differentiation in the left maxilla, measuring approximately 32.5 x 41.2 x 22.9 mm (Supero-inferior, Antero-posterior & medio-lateral) as calculated using virtual tool of Wipro GE health care CT machine at our hospital. (Figure-2).



Figure-2: NCCT slices in Sagittal, Coronal, Axial and 3D-Reformatted views revealing extent of lesion

There was a homogenous opacity throughout the lesion barring the anterior end which showed mixed radiolucent and radio-opaque specs. The superior extension of the radio-opacity merged with the floor of the maxillary sinus however did not obliterate the same. The incisional biopsy was carried out and the decalcified sections revealed cellular fibrous connective tissue with well mineralized and calcified bone. The bony material was variably sized and shaped and formed anastomosing strands with frequent osteoblastic rimming present. The fibrous tissue exhibited spindle shaped cells with no atypia and/or multinucleated giant cells or stromal hypercellularity. Overall, the histopathological specimen was suggestive of OF. (Figure-3). The Alkaline phosphatase levels were also analyzed which were well within normal limits.

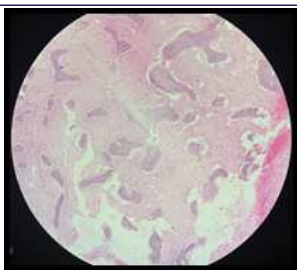


Figure-3: OF Photomicrograph As Per Description In Text

Surgical Procedure:

Keeping in view the massive extent of the pathology specifically involving the floor of the maxillary antrum, benign nature of the disease and other socio-economic and geographical factors of extreme high altitude region above 11000 Feet, a modified surgical treatment of ANTRUM SPARING RESECTION was carried out leaving approximately 11 mm of subantral bone intact to avoid complications of open antrum with leaking nasal secretions, need for second surgical reconstruction procedure/ permanent surgical splint, which otherwise requires resection of 5mm to 1cm of healthy margin. [3] (**Figure-4**)

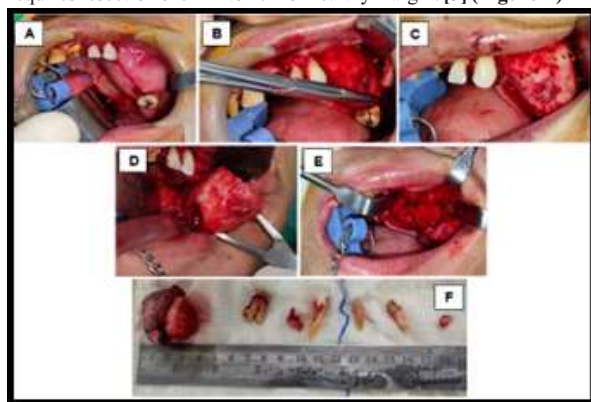


Figure-4: A) Crestal Incision with crevicular extensions, B) Intra-op supero-inferior measurement of the swelling with 2-0 silk suture, C) Postage stamping of the pathology, D) Resection in process E) Residual Bed of subantral bone, F) Resected specimen with teeth

The patient was kept on Injection Cefotaxime 1gm, Injection Metronidazole 500 mg, Injection Paracetamol 1gm, Injection Dexamethasone 8mg (tapering), Injection Pantoprazole 40 mg for 5 post-operative days as per our hospital protocol and discharged uneventfully. HPE of resected specimen was also suggestive of OF. Periodic follow-ups were scheduled which revealed healthy recovery of surgical site. The six monthly follow up of the patient is depicted in **Figure-5** showing no recurrence with appreciable antral lining from the surrounding bone as left in-situ during resection. The patient is currently being planned of suitable prosthetic rehabilitation.

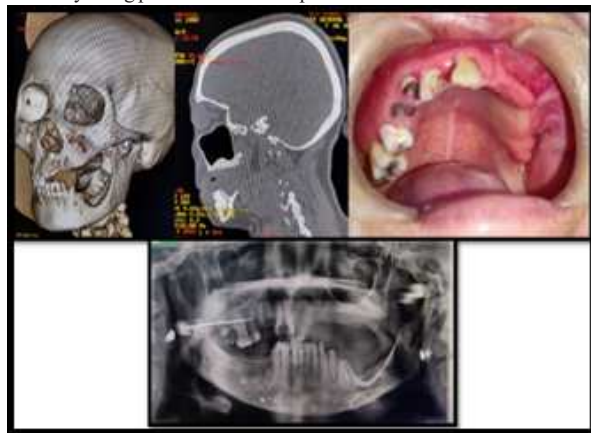


Figure-5: Post op NCCT, intra-oral picture and OPG of the patient

DISCUSSION

The term "Ossifying Fibroma" has evolved over a period of time with enhanced research on the disease and World Health Organization

(WHO) categorizing such benign fibro-osseous lesions of the oral and maxillofacial region into osteogenic neoplasms or non-neoplastic bone lesions. As part of osteogenic neoplasm, the cementum associated lesion was ultimately simplified from cementifying ossifying fibroma to "Ossifying Fibroma" in 2005. [4,5]

The pathology generally remains clinically asymptomatic and forms a part of incidental diagnosis during oral examination, similar to the case discussed, unless producing obvious facial asymmetry. Sex predilection favors the female gender especially during second to fourth decade of life. [6] Mostly, a slow-growing lesion, its aggressive counterparts are witnessed in juvenile subtypes. The growth pattern shows concentric with homogenous cortical to cortico-medullary differentiation. In maxillofacial skeleton mandible premolar-molar region is the predominant site however can occur in maxilla too as was seen in the case presented.

The diagnosis includes clinical, radiological, histological and even biochemical analysis though latter is only used to rule out entities like FD with specific value of Alkaline phosphatase enzyme being markedly elevated in affected patients. Radiographically, it appears typically as a radiolucent lesion in an early stage with increasing calcified flecks eventually producing a radiopaque mass. The predominant radiographic features of OF are a round or oval well-defined, expansile mass with a corticated border and a variable degree of internal radio-opacity. Internally, the lesions can be granular, resembling FD, may have a thin, radiolucent periphery of a fibrous capsule leading to expansion of the outer bony cortical plate. The density is usually mixed. [7]

The differential diagnosis of OF includes lesions with a mixed radiolucent and radiopaque radiographic presentation like FD, Cemento-osseous dysplasia, Cementoblastoma etc. OF usually have better-defined boundaries, whereas the periphery of FD blends into the surrounding bone, the latter being more homogenous while expansion pattern is concentric in OF and distorted in FD. Radiographically, Periapical osseous dysplasia is often multifocal, whereas OF is not. Cementoblastoma, on the other hand, is a true benign neoplasm of the cementum with unlimited proliferation expressing as a bulbous growth of the cementum on the tooth root unlike OF. [8]

Nevertheless, histopathological examination is the gold standard for diagnosing such lesions after having evaluated clinically and radiographically, which forms the definite diagnosis and aids in planning the surgical treatment especially with similar and overlapping presentations with other Fibro-osseous lesions.

Treatment:

Treatment of choice for small, well demarcated lesions is enucleation however varied clinical and radiological presentation may call for curettage, and surgical resection of the tumor with or without continuity defect especially when no cleavage margin can be established, on radiographic examination as well as intra-operatively as was seen in our case. Larger OF requires more aggressive approach owing to tendency for recurrence after incomplete removal followed with bony reconstruction depending upon size and volume of the defect. [9] However such cases generally are in close association of vital anatomical sites like maxillary antrum, where requirement of secondary reconstructive procedures increases the overall morbidity superadded with high altitude induced physiological changes beyond 11000 Feet as in our center.

Patients present with additional findings of Secondary polycythemia, Cold injuries, decreased pO₂, prolonged venous stasis which may complicate simple surgeries and prolong hospital stays and antimicrobial therapy especially due to hypoxia induced altered neutrophil function which accentuates probability of post-surgical infections and also produce magnified inflammatory response. Heightened necessity of post-op oxygen therapy to counter decreased respiratory drive following general anesthesia and atmospheric hypobaric hypoxia add to challenges of second surgical procedure [10] for which we introduced modified procedure of Antrum sparing resection leaving 11 mm of subantral bone intact to avoid the ibid complications and we achieved good results with no recurrence. The patient is currently under periodic follow up as long-term follow-up of these patients is mandatory as recurrences can occur for up to 10-15 years following treatment. [11] Such modified treatments can be successfully looked into for OF especially in high altitudes which lead

to superior outcomes.

CONCLUSION

Antrum Sparing Resection is a promising surgical modality for large OF which obviate the need of extensive morbid surgeries and secondary procedures in large pathologies.

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