Treatment Plan for Ameloblastoma: A Review

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Abstract

Ameloblastoma is a tumor of odontogenic origin that exhibits 1% of all oral cavity tumors. Solid and multi-cystic are well chosen as locally aggressive, with elevated recurrence rates incase of conservative treatment. The objective of this review article is to analyze that the management of ameloblastoma should be done conservatively or radically. The appropriate management of ameloblastoma should reduce reappearance, reinforce function and aesthetic, and exhibit a minimum damage in the donor area. Planning of the treatment must be done based on the extent,position, andtype of the lesion.

Keywords: *Ameloblastoma, Surgery, Enucleation, Radical.*

Introduction

The second most common odontogenic tumor is ameloblastoma.[1] It is found particularly in the jaws, with a tough preference for the dorsal part of the mandible. Even though the tumor is benign, it is destructive, locally invasive and the recurrence rateis high even after adequate surgical elimination. The WHO tumors classification in 2005, mentioned that "the variation of ameloblastomas are the solid/multicystic, the extraosseous ameloblastoma, the desmoplastic and the unicystic type".[1] The exact pathogenesis of ameloblastoma is unknown. Various factors such as infection, non-healing wound,inadequate nutrition, as well as a probable correlation with the Human Papilloma Virusmay add to the cause.[2] Ameloblastoma can cause damageto the compact bone. This results in infringement of the soft tissues of the oral cavity disarranged occlusion ,dissymmetry,irritation and if the inferior alveolar nerve is affected it may lead toparesthesia.[1,3] Ameloblastoma in the former stage is identified through OPG accidentally if the patient would have come to do OPG for other reasons or because patients confer for symptoms to the consultant and then a histological examination is done for confirmation.[3] Currently,multi-cysticandsolid ameloblastomas are expressed as locally aggressive, with a greater chance of reappearance if conservative treatment is done.[4] Aggressiveness of ameloblastoma of Unicystic variety is lower, and the risk factor of reappearance is very minimum if treated conservatively. The peripheral ameloblastomas gives better feedback if local excision is done.[4]

The selective management of ameloblastoma is any ways an operative procedure, but the choice of surgery depends on its clinical nature. The better treatment procedure has always been a topic of debate for the treatment of ameloblastomas. Enucleation or marsupialization, is considered under conservative procedures along with curettage, and use of liquid nitrogen or Carnoy's Solution. Major surgical procedures such as segmental or Hemimandibulectomy comes under radical treatment.[5]

Literature review: World Health Organization defines ameloblastoma as "a benign lesion of follicular or plexiform aspect with a fibrous stroma. The most common feature of ameloblastoma is that it is a benign epithelial odontogenic tumor with no

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element of ectomesenchyme."[6] Taking pathogenesis into account, the literature says that this lesion most likelyoriginates due tothe proliferation of the residual cell of the enamel organ. Along with this,it is also said that various molecules and alterations of genes have an impact on the triggering of odontogenic epithelium that leads to ameloblastomas.[7] Frequency of occurrence of ameloblastoma is more common in mandible than the maxilla. Among which 70% of cases are seen inthe mandibular body and 20% in the ascending branch of the mandible and rest 10%of the cases are found in the maxilla.[8]It is also noted that 15% of the ameloblastomas involve the maxillary sinus and the nasal floor. The involvement of the palate is negligible.[9] Pogrel et al. makes a review of 58 articles and found that"randomized clinical trials were available.[10] The results showed a recurrence of 60-80% with simple enucleation of solid and multicystic ameloblastoma, therefore, the treatment should be the segmental resection with 1 cm of margin to the bone, including a soft tissue margin. For unicystic ameloblastoma, the authors recommend an enucleation accompanied by a support technique. If not possible, a block resection with 0.5-1 cm margins would be the correct technique. Finally, the peripheral ameloblastoma responds well to the local excision."

A retrospective study is done by Hammarfjord et al.in which he hasdone the analysis and found that the reappearance of intrabony ameloblastoma in 48 patients and concluded that-"Radical treatment is recommended when recurrence and conservative option should be reserved for small intrabony ameloblastoma.[11] However, given the low rate of metastases, the chosen technique must consider the quality of life and comorbidities of the patient. Thus, the authors suggest a conservative treatment of ameloblastoma along with an annual follow-up for 10 years as a good alternative to processes that would involve aggressive resections, especially if there are no medical and personal factors that could compromise follow-up. It seems that enucleation can be the best alternative when assessing all the important aspects for the patient, but radical surgery is the correct option when the lesion is close to vital structures or when it cannot be treated conservatively."Simon et al. have done a cohort study where he has compared 64 patient's treatment procedures. These patients were treated radically. Out of 64 patients,32 patients have undergone immediate reconstruction during the same surgical procedure whereas 32 patients treated have not gone subsequent reconstruction. The success rate was more in patients who had reconstruction procedure immediately after surgery.[12]

Method of Diagnosis: Imaging tests such as X-rays,CT and MRI help the doctors to diagnose and determine the extent of ameloblastomas .and the confirmation of the disease is done by histopathological evaluations. CT scan is one of the relevant method of diagnosis for the determination of possibilities and extensions of ameloblastomas. Coinciding of images and dissertation errors are negligible in CT scan.[13,15] In histopathological examination, the appearance of islets, nests, and strands containing ameloblastic epithelial cells accomplished with a fibrous stroma is necessary to confirm the possibilities of occurrence of ameloblastomas. Follicular and plexiform patterns of ameloblastomasare most common, although there are also studies of unusual types, such as acanthomatous ameloblastomas with granular and basal cells.[15]

Treatments: The decision of the appropriate type of treatment is a very crucial step and the omission of the lesion should be the target on, considering the future social and personal aspect of a patient's life. Moreover,the treatment plan depends on the size,extent,type and histopathological feature of the ameloblastoma. More aggressiveness of surgery reduces the chance of reoccurrence.[16] If the lesion invades a greater portion of the cortical bone and anatomical structures, aggressive surgery should be opted to have discontinuation between bone pieces, along with the removal of periosteum and soft tissues.[17] Cosmetic surgery should be done postoperatively for a better lifestyle of the patient. A major drawback of management for ameloblastoma is the worsening of esthetics or facial appearance in the aggressive method surgical procedures that are done to remove the lesion.[18] This factor hampers the treatment procedures of the patient as they are isolated from the society. Education and Awareness among the patient and society about ameloblastoma is much essential to overcome this negative aspect.

Discussion

The most appropriate surgical treatment of ameloblastoma should be such that it should reduce the chance reappearances, should not hamper the functional and social status of the patient much and demonstrate a negligible distress in the donor area. Conservative techniques include minor surgical excision procedures such as marsupialization, enucleation,

curettage orcan be adjuvanted with cryotherapy, Carnoy's solution.[15,16] This type of treatment plan can be executed as a treatment option for less aggressive ameloblastomas. This type of treatment option has less effect on worsening the functional and esthetic part of the patient but the chances of recurrence are high if only enucleation has opted as a treatment option. In the case of aggressive tumors or if there is no possibility of combined conservative treatments, radical surgery with 0.5-1 cm of margins is preferred followed by cosmetic surgery as reconstruction procedure, forbetter outcomes. Radical surgery with an extent of 1 cm as margins and elimination of peripheral tissuesof the region followed by reconstruction is the choice of management for solid and multicystic ameloblastoma. Radical surgery rather than conservative management is always preferred in the case of large tumors.[17,18]

Conclusion

In this review, we concluded that aggressive surgery like radical surgery is the better treatment option in multicystic or solid and advanced unicystic tumors and should be followed up by the surgeon for the next 7-8 years. Adjuvant Conservative surgery with a constant follow-up for rest 20 years opts for the less aggressive type of ameloblastomas

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References

1. Ooi A, Feng J, Tan HK, Ong YS. Primary treatment of mandibular ameloblastoma with segmental resection and free fibula reconstruction: Achieving satisfactory outcomes with low implantprosthetic rehabilitation. J Plast Reconstr Aesthet Surg. 2014;67:498–505.
2. Bianchi B, Ferri A, Ferrari S, Leporati M, Copelli C, Ferri T. Mandibular resection and reconstruction in the management of extensive ameloblastoma. J Oral Maxillofac Surg. 2013;71:528–37.
3. Sham E, Leong J, Maher R, Schoenberg M, Leung M, Mansour AK. Mandibular ameloblastoma: clinical 11 experience and literature review. ANZ J Surg. 2009;79:739–44.
4. Pogrel MA, Montes DM. Is there a role for enucleation in the management of ameloblastoma? Int J Oral Maxillofac Surg. 2009;38:807–12.
5. Hammarfjord O, Roslund J, Abrahamsson P, Nilsson P, Thor A, Magnusson M. Surgical treatment of recurring ameloblastoma, are there options? Br J Oral Maxillofac Surg. 2013;51:762–6.
6. Adebiyi KE, Ugboko VI, Omoniyi-Esan GO, Ndukwe KC, Oginni FO. Clinico pathological analysis of histological variants of ameloblastoma in a suburban Nigerian population. Head Face Med. 2006; 2: 42.
7. Martinez CR, Barros RMG, Orué NR, Oliveira JGP, Monteiro JCC. Ameloblastoma: estudo clínico histopatológico. Rev Cir Traumatol Buco-Maxilo-Facial. 2008;8(1):55-60.
8. Hasim FW, Poon CC, Smith AC. Prolonged survival with confirmed metastatic pulmonary ameloblastoma. Int J Oral Maxillofac Surg. 2007 Oct;36(10):953-5.
9. Alfaro HA, Obispo CA. Bone grafting in oral implantology: techniques and clinical applications. London: Quintessence Publishing; 2006.
10. Pogrel MA, Montes DM. Is there a role for enucleation in the management of ameloblastoma? Int J Oral Maxillofac Surg. 2009;38:807–12.
11. Simon EN, Merkx MA, Kalyanyama BM, Shubi FM, Stoelinga PJ. Immediate reconstruction of the mandible after resection for aggressive odontogenic tumours: a cohort study. Int J Oral Maxillofac Surg. 2013;42:106–12.
12. Guimarães FLL. Considerações no tratamento de ameloblastomas: revisão de literatura [monografia]. Belo Horizonte, Universidade Federal de Minas Gerais; 2007.
13. Bisinelli JC, Ioshii S, Retamoso LB, Moysés ST, Moysés SJ, Tanaka OM. Conservative treatment of unicystic ameloblastoma. Contemp Clin Dent. 2011;2(4):359-363.
14. Butt FM, Guthua SW, Awange DA, Dimba EA, Macigo FG. The pattern and occurrence of ameloblastoma in adolescents treated at a university teaching hospital, in Kenya: a 13-year study. J Craniomaxillofac Surg. 2012 Feb;40(2):e39-45.
15. Berger AJ, Son J, Desai NK. Malignant ameloblastoma: concurrent presentation of primary and distant disease and review of the literature. J Oral Maxillofac Surg. 2012;70(10):2316-26.

16. Dissanayake RK, Jayasooriya PR, Siriwardena DJ, Tilakaratne WM. Review of metastasizing (malignant) ameloblastoma (METAM): pattern of metastasis and treatment. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2011;111(6):734-41.
17. Hirschhorn AI, Vered M, Buchner A, Greenberg G, Yahalom R. Unicystic ameloblastoma in an infant: a management dilemma. J Craniomaxillofac Surg. 2013 Dec;41(8):e226-30.
18. Hertog D, Schulten EA, Leemans CR, Winters HA, Van der Waal I. Management of recurrent ameloblastoma of the jaws; a 40-year single-institution experience. Oral Oncol. 2011;47:145–6.