CASE REPORT

IMPLANT SUPPORTED REHABILITATION AFTER CONSERVATIVE MANAGEMENT OF AMELOBLASTOMA : A CASE REPORT

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ABSTRACT

Unicystic ameloblastoma is a benign, locally invasive odontogenic neoplasm of young age which can develop during the stage of tooth formation. Radical approaches have effects on the physical and psychological development of a growing young patient. Conservative surgical management may be a viable option to reduce morbidity and increase the probability of uneventful secondary healing and bone regeneration in the younger population. The use of osseointegrated dental implants for rehabilitation is advisable, as it allows the recovery of the masticatory function.

In this article, a case report has been elaborated where an ameloblastic lesion was managed in conservative approach. Complete follow up of 10 years had been done in this case. After completion of the healing of surgical site, implants were placed in that region without any need of a bone graft for occlusal rehabilitation purpose.

KEY WORDS

Unicystic ameloblastoma, Conservative treatment, Enucleation with peripheral ostectomy, Dental implants.

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INTRODUCTION

Quailty of life following any ablative surgery of body is compromised. Treatment of mandibular ameloblastomas include conservative measures and radical treatments such as, marginal and segmental resection[1]. Careful prosthetic planning with the placement of osseointegrated implants could achieve successful rehabilitation with the restoration of function and esthetics. The benefits of implant-retained prosthesis have been recognised since several years. Dental implants may improve denture retention and stability without unnecessary loading of the vulnerable mucosa. Function, comfort, aesthetics, and eventually the quality of life can be improved.

This case report represents patients with mandibular unicystic ameloblastoma, whose surgical treatment was enucleation with peripheral ostectomy followed by rehabilitation with dental implants.

CASE REPORT

A 9-year old boy reported to our department with a swelling of lower anterior region of jaw. The swelling had started 1 year previously and since then, there had been a gradual increase in size. There was no associated pain, difficulty in opening the mouth, chewing or articulating. He also denied any history of trauma and the past medical and family history was insignificant. He denied experiencing any bleeding, pain or sensory changes.

On physical examination, The swelling was oval in shape crossing the midline thereby obliterating the labiomental sulcus.

The swelling had smooth surface with normal overlying skin but stretched. It was non-tender on palpation.

The intra-oral examination revealed a mass approximately 3×2 cm in size, extending from lower right deciduous canine to mesial surface of right deciduous 2nd molar buccally. Buccal expansion of the mandibular left and right symphyseal and para-symphyseal region was evident. The overlying mucosa appeared normal. 31, 32 and 41 were

labially displaced. Clinically White heads varnish pack was present within cystic cavity.

On palpation, the swelling was found to be firm, bony hard in consistency, non-tender, non-fluctuant, non-reducible, non-compressible and non-pulsatile. The teeth in the vicinity were non-tender to percussion; there was mobility of 31, 32, 41, 42. No lymphadenopathy or fistulae were present.

Previously patient was operated elsewhere, at that time incisional biopsy was done. The histopathological examination revealed Dentigerous cyst involving same site.

The panoramic radiograph (Fig 1.) revealed a unilocular radiolucent lesion of approximately 4×3 cm in symphysis and body of the mandible associated with radio-opaque white-heads varnish pack present with in defect cavity. The panoramic radiograph showed the lesion associated with an unerupted canine, premolars bilaterally and resorbed lower anteriors.

Figure 1. Preoperative orthopantomogram showing welldefined radiolucent lesion involving parasymphysis region of mandible with unerupted or malformed lower anteriors and premolars.

Incisional biopsy was done, and a histopathological examination of the cystic lining disclosed Plexiform variant of unicystic ameloblastoma. Enucleation of the lesion and peripheral ostectomy done, along with extraction of 71, 72, 73, 75, 81, 82, 83, 43. The residual cavity was then packed with White heads varnish impregnated gauze and secondary closure done. (Fig 2.)

Figure 2. Postenucleation showing removal of unerupted /malformed teeth and bony defect

Figure 3. Post operative 3 years follow up.

White heads varnish gauze was changed postoperatively until the bone cavity healed completely. The patients were then followed up regularly. Approximately every year regular clinical and every 2-3 years regular radiographic follow-up was done untill satisfactory bone healing was achieved. Extraction of 33, 34, 44, 45, 46 was done after 3 years of enucleation due to incomplete root formation and lack of adequate bony support. (Fig 3.)

After 5 and 8 years follow up of lesion with proper clinical and radiographically showed bone healing. During this time patient used to wear removal partial denture as a space maintainer, which was trimmed in between according to bone healing. (Fig 4a and 4b.)

After 10 years follow up of lesion with proper clinical and radiographically showed proper bone

Figure 4a. Post operative 5 years of follow up

Figure 4b. Post op 8 years follow up

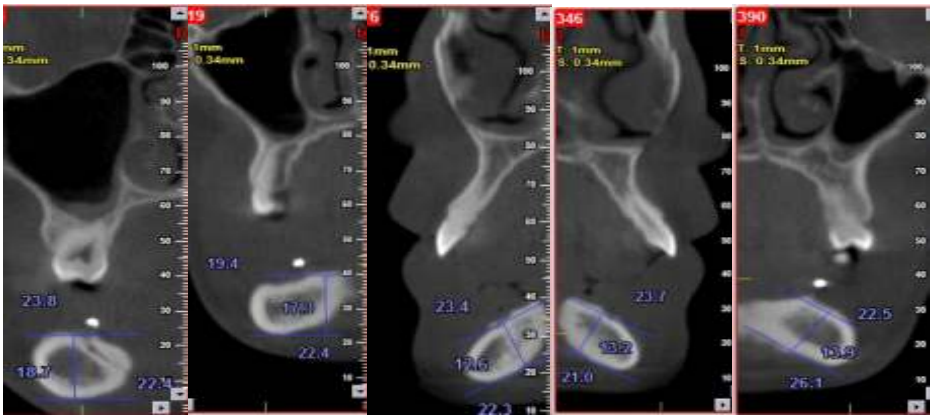


Figure 5. cone beam computed tomography before implant placement (after 10 years follow up)

healing (Fig 5.). When patients age reached 19 yrs, we planned for complete dental rehabilitation using fixed implant-supported prosthesis.

WORK UP

Necessary investigations like study model, CBCT (Fig 5) were done and stent was fabricated. Five regular dental implants (MYRIAD) were placed at 32(4.5mm×8mm), 33(4.5mm×8mm), 42 (4.5mm×8mm), 44(4.5mm×8mm), 46 (3.8mm×11mm) regions. Implants at 32, 33, 42 and 44 regions placed within basal bone of mandible because lack of alveolar bone. (Fig 8,9,10 and 11)

We did some modification of implants placement.

Right lower molar (46) – 3.5D × 11L implant placed buccally, as ID canal displaced lingually.(Fig 6A & B) Distance between lingual cortex and ID canal = 9.2mm. Distance between ID and crest = 3.5mm.

Right lower second premolar (44) - 4.5D×8L implant placed, Distance between lingual cortex to ID canal=2.1mm (Fig 7.)

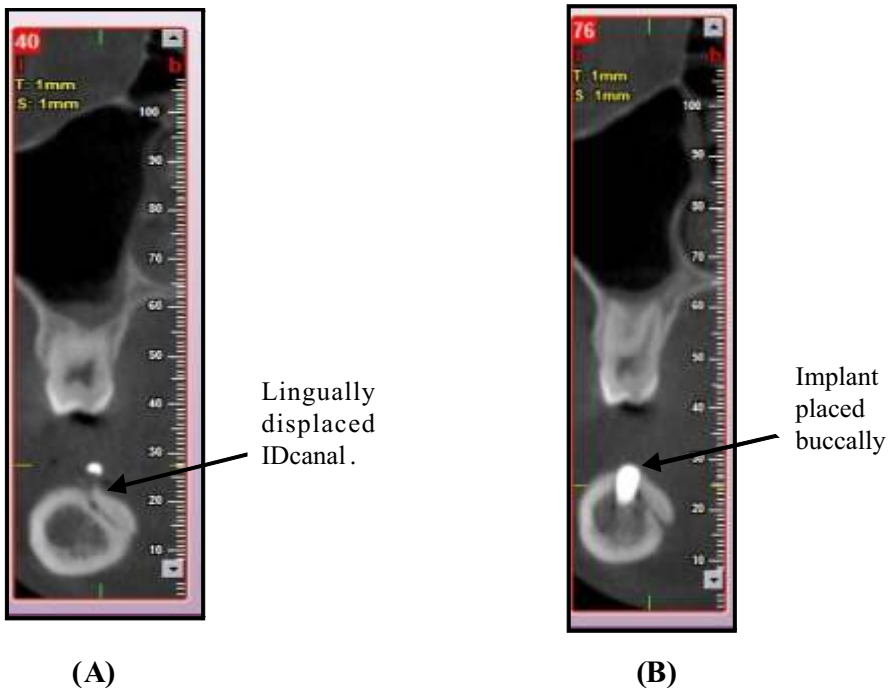


Figure 6. Right lower molar CBCT before implant placement (A) and immediate after implant placement (B)

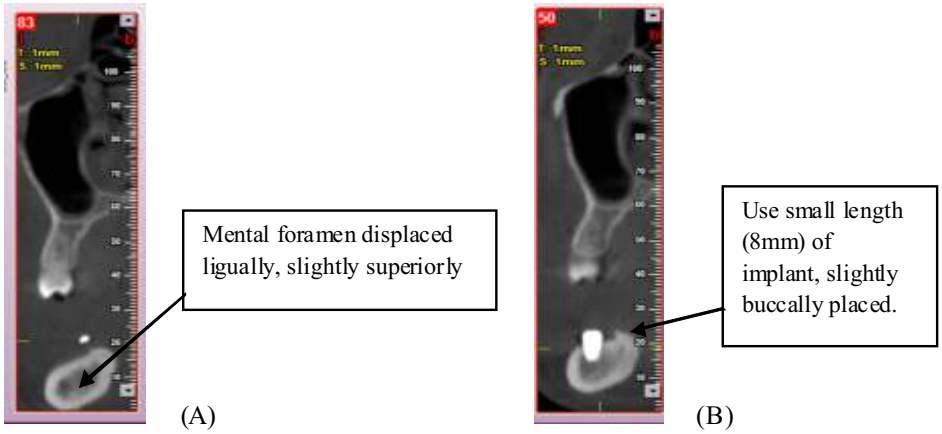


Figure 7. Right lower second premolar CBCT before implant placement (A) and immediate after implant placement (B)

Figure 8. Pre operative view of implant PLACEMENT

Figure 9. Implant placement

Figure 10. Clinically and radiographically shows placement of dental implants

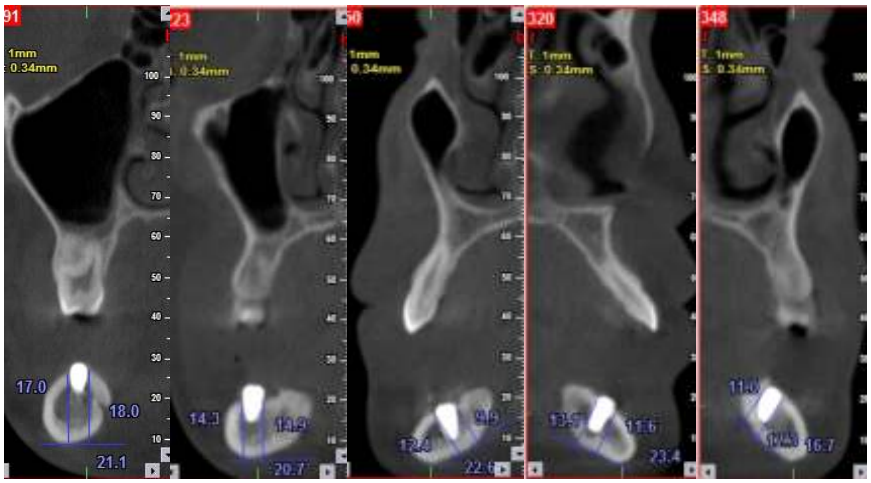


Figure 11. cone beam computed tomography immediate after implant placement

FIGURE 12. 3 months after implant placement, healing abutment placed.

Figure 13. Implants with prosthetic abutments

Figure 14. Impression with transfer coping

Figure 15.Mounted cast on semi adjustable articulator

Figure 16. Final prosthesis on cast

Figure 17. Patient with final prosthesis

PROSTHETIC PHASE

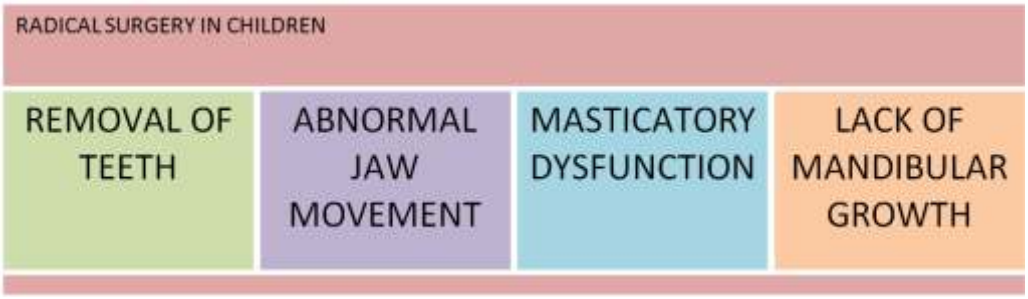
After sufficient healing (3 months of implant placement) period, we checked for proper osseointegration (osseointegration sign - no clinical mobility, transmitted sound by tapping metal instrument) (Fig 12). Healing abutment placed for 2 weeks.

Implant supported bridge was given which fixed type, completely supported by osseointegrated implants, which compensated for the loss of hard tissue (alveolar bone) as well as soft tissue (i.e) by providing support to the lower lip (Fig 13 to 17).

DISCUSSION

The term ameloblastoma was suggested by Churchill in 1934. Ameloblastoma, a true neoplasm of the enamel organ tissue type that does not undergo differentiation up to the point of enamel formation. (Reddy et al., 2012)[2]

Unicystic ameloblastoma is a rare variant of ameloblastoma that was first described by Robinson and Martinez in 1977, referring to those cystic lesions that show clinical and radiologic characteristics of an odontogenic cyst but in histological examination it shows a typical ameloblastomatous epithelium lining



part of the cyst cavity, with or without luminal and/or mural tumor proliferation.[3]

The young age at occurrence, unilocular radiographic appearance, macroscopic cystic appearance, and most importantly, the better response to conservative treatment, make it a distinguishable entity. About 90% of the lesions are located in the mandible and between 50 to 80% of these cases are associated with an impacted tooth.[3]

Various treatment modalities for UA have been used. The reported recurrence rate after treatment for unicystic ameloblastoma ranges from 10% to 25%.[4]

According to many studies, the recurrence rate after radical treatment is lower than that after conservative treatment. Lau et al., reported that the recurrence rate of 3.6% for resection, 30.5% for enucleation, 16% for enucleation followed by Carnoy's solution application and 18% for marsupialization followed by enucleation.[5]

Seintou et al. reported a recurrence rate of 29.4% after enucleation or excision, and all recurrent cases were related to the conservative approach with enucleation or excision.[6]

Enucleation alone yielded the highest recurrence rate among all treatment (30.5%). Two possible explanations: firstly, cystic lining of the tumor is inadequately removed; secondly, ameloblastic tumor cells can invade the cancelleous bone to a certain extent.[5]

In this case report, patient was younger age group, the treatment of ameloblastoma in children is complicated by three factors:-[7]

1. Continuing facial growth

2. Different bone physiology (greater percentage of cancellous bone, increased bone turnover and reactive periosteum)

3. Presence of unerupted teeth

4. Difficulty in initial diagnosis

5. Predominance of the unicystic type of ameloblastoma

Radical surgery undoubtedly minimizes the risk of recurrence. But it is bound to cause a large bone defect and the following severe facial deformity, malocclusion, lip numbness and poor mastication (Nakamura et al., 2002)

According Huang et al., 2007 Aggressive resection of these large mandibular cystic ameloblastomas is bound to cause severe deformity and dysfunction. Considering it is essentially benign and rarely life-threatening, it is not reasonable to reduce recurrence at the sacrifice of a patient's postoperative quality of life. The authors propose that postoperative quality of life be given priority over reduction of recurrence in the management of a large mandibular cystic ameloblastoma.[8]

According to sampson and pogrel, plexiform type of unicystic ameloblastoma, which is more common in children, behaves less aggressively than follicular type supporting conservative treatment.[9]

Among the pediatric and adolescent population, the conservative line of treatment plays an excellent role as it is associated with a faster 'bone fill' and efficient restoration of normal bony architecture, which is attributed to the pliability of the young bones and hence lesions of a huge expanse can be successfully treated. Unicystic ameloblastoma is biologically less aggressive and has a better response to enucleation or curettage than the solid ameloblastoma.[10]

Tanaka et al. demonstrated that minimal surgical treatment should be the first choice procedure for any case of oral and maxillofacial benign tumors in children.[11]

Shi S at al concluded their study that By using Enucleation with Peripheral ostectomy for management of large cystic ameloblastomas of the mandible, the contour and functions of the patients were well preserved. Firstly, the mandible continuity was maintained after Enucleation with Peripheral ostectomy. Another advantage of Enucleation with Peripheral ostectomy is that the integrity of inferior alveolar nerve can be preserved.[8]

Patient was reviewed for 10 years before implant placement and between this time period patient used removal prosthesis as a space maintenance for implant placement. Prosthetic phase of restoration was initiated after 3 months of clinical and radiographic assessment of osseointegration.

CONCLUSION

The choice of conservative treatment of enucleation with peripheral ostectomy and the extraction of involved teeth proved to be effective in a pediatric population. In the case reported here, the conservative surgical treatment of mandibular ameloblastoma yielded excellent postoperative function and aesthetics with no further recurrence. The quality of life can be improved with the use of dental implants & implant supported prosthesis when proper bone healing achieved by conservative treatment of ameloblastoma, which is evident clinlically and radiographically.

Conflict of interest : None

Consent : Written informed consent were obtained from the patients for publication of this case report and accompanying images.

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REFERENCES

1. Sammartino G, Zarrelli C, Urciuolo V, Di Lauro AE, Di Lauro F, Santarelli A, Giannone N, Muzio LL. Effectiveness of a new decisional algorithm in managing mandibular ameloblastomas: a 10-years experience. British Journal of Oral and Maxillofacial Surgery 72007 Jun 1;45(4):306-10.

2. Rajendran R. Shafer's textbook of oral pathology. 6th edition, Elsevier India; 2009.

3.Hsu MH, Chiang ML, Chen JK. Unicystic ameloblastoma. Journal of Dental Sciences. 2014 Dec 1;9(4):407-11.

4.Robinson L, Martinez MG. Unicystig ameloblastoma. A prognostically distinct entity. Cancer. 1977 Nov; 40(5):2278-85

5. Lau SL, Samman N. Recurrence related to treatment modalities of unicystic ameloblastoma: a systematic review. International journal of oral and maxillofacial surgery. 2006 Aug 1;35(8):681-90.

6. Seintou A, Martinelli-Kläy CP, Lombardi T (2014) Unicystic ameloblastoma in children: systematic review of clinicopathological features and treatment outcomes. Int J Oral Maxillofac Surg 43:405–412.

