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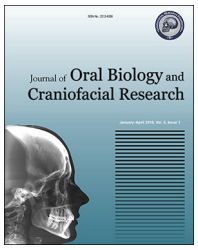

Original Article

# Treatment of cystic lesion of mandible using combination of modified bone granules and calcium phosphate bone cement: A preliminary report

*Richik Tripathi* [a,*], *Fahad M. Samadi* [b], *Sanjeev Kumar* [c]

[a] *Service Senior Resident, Oral Maxillofacial Surgery Division, Faculty of Dental Sciences, Institute of Medical Sciences Banaras Hindu University, Varanasi, India*

[b] *Assistant Professor, Department of Oral Pathology and Microbiology, KGMU, Lucknow, India*

[c] *Prof & Head, Department of Oral Maxillofacial Surgery, ITS Dental College Muradnagar, UP, India*

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ABSTRACT

*Aims:* This study was conducted to evaluate healing of bony cavity in mandible following enucleation of cystic lesion by obliterating the cavity using modified natural bone granules (G Graft) and calcium phosphate bone cement (G Bone).

*Materials and method:* In this technique, after enucleation of cystic lesion, peripheral ostectomy using No. 702 fissure bur and perforation of the inferior cortex using 1.5 mm drill bits were performed. Modified hydroxyapatite granules were used to fill the defect while calcium hydroxide bone cement was used to seal the cavity opening. Thirty-seven patients were treated using this technique. In 30 patients, quality and quantity of bone were within acceptable limits, and in 7 patients, there was extrusion of graft material and post-operative infection.

*Conclusion:* Treatment of cystic lesion of mandible using combination of modified bone granules and calcium phosphate cement is good alternative to other treatment methods. Long-term and comparative studies are required to evaluate its advantage over the other methods of treatment.



## 1. Introduction

A number of techniques have been proposed for obliteration of bony cavity which is left behind after enucleation of cysts and cyst-like lesion from body of mandible. Obliteration of bony cavity is performed using special surgical techniques or by limiting the volume of the blood clot in the cavity.[1] The former can be accomplished by approximating the bony walls of the cavity or by saucerization-like procedures, while the latter requires grafting with bone and bone substitutes or implantation with a variety of alloplastic materials. Surgical techniques like saucerization, application of osteoperiosteal flap and placement of autogenous bone graft are invasive and time

* *Corresponding author.*
E-mail address: richik.tripathi@gmail.com (R. Tripathi).

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**Fig. 1 – Bovine derived and modified hydroxyapatite granules (G graft).**

consuming surgical procedures and there is morbidity of donor site.[2] Allografts also have all the characteristics of autografts with the exception of osteogenesis due to the processing that they must undergo. Some are subjected to lyophilization and demineralization, which leaves them more brittle, while others undergo biomechanical alteration with the loss of compressive, bending and torsional strength. Xenografts are good alternative to autografts or allografts but are more costly compared to allografts. Both xeno- and allografts have advantage over other surgical techniques, as there is reduced morbidity of donor site. Continuous research work in field of biomaterials has greatly improved osteoconductive and osseoinductive effects of bone substitutes.[3] In the past, a number of studies have been done which used calcium phosphate bone cement or modified hydroxyappetite granules for obliteration of cystic cavity in bone.[4,5] Our study is unique, as we used both natural hydroxyapatite and calcium phosphate bone cement to obliterate bony cavities (Figs. 1 and 2). This prospective study is conducted to evaluate healing of bony cavity in mandible following enucleation of cystic lesion by obliterating the cavity using modified natural bone granules (G graft) and calcium phosphate bone cement (Fig. 3).

**Fig. 2 – Calcium phosphate bone cement (G Bone cement).**

**Fig. 3 – G bone cement after mixing with liquid becomes putty-like material.**

## 2. Materials and method

Written consent was obtained from patients and study conformed to the ethical guidelines of the 1975 declaration of Helsinki. Thirty-seven patients in the age group of 12–58 years who were diagnosed to have cystic lesion in body of mandible were selected. Diagnostic criteria for presence of cyst in body of mandible were presence of well-defined radiolucent lesion seen on panoramic X-ray, presence of fluid on aspiration and histopathological confirmation regarding type of cyst and its origin.

*Inclusion criteria*:

(a) Age between 12 and 58 years
(b) Presence of cystic lesion in mandible

*Exclusion criteria*:

(a) Presence of metastasis
(b) Excessive destruction of bone (through and through defects, excessive thinning of lower border)
(c) Infected cysts
(d) Poor medical condition

Size of the cyst cavity was measured using CT scan. Depending upon size they were classified into three different groups: Group A – Cyst measuring less than 2 cm in greatest dimension, Group B – Cyst measuring less than 3 cm in greatest dimension and Group C – cyst measuring more than 3 cm in greatest dimension. Enucleation of cyst was done under local anaesthesia for cysts located in body of mandible (Fig. 4), and those located in molar-ramus area were operated under general anaesthesia. After reflection of mucoperiosteal flap, cyst lining was identified and carefully dissected from muco periosteal layer (Fig. 5), if nerve is present in surgical field, it was identified and preserved and cyst was carefully enucleated. After complete enucleation, peripheral ostectomy was performed using 702 fissure bur. A 1.5 mm drill bit was used to perforate the inferior cortex to increase vascularity at the graft placement site (Fig. 6). First bovine derived modified hydroxyapatite granules (G Graft, G. Surgiwear limited, India)