

# Evaluation of the Pulp Chamber Morphological Measurements in Maxillary First Premolar : A Cone Beam Volumetric Analysis

**Dr. Shravan Rathi**  
Private Practitioner  
(Endodontics)

**Dr. Deepa Shori**  
Professor  
V.S.P.M.D.C.R.C. Nagpur

**Dr. Somya Rathi**  
Private Practitioner

**Dr. Swapnil Pande**  
P.G. Student  
V.S.P.M.D.C.R.C. Nagpur

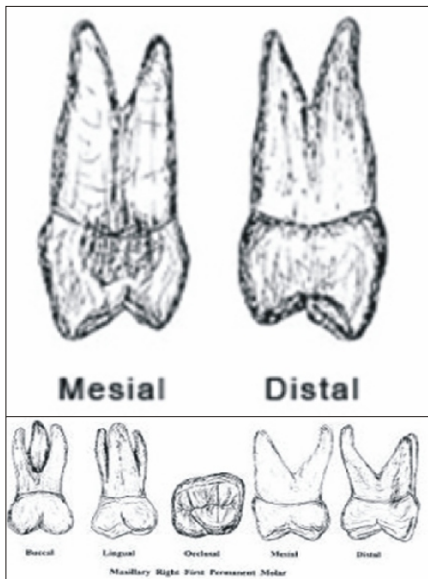
**Dr. Nomal Shah**  
P.G. Student  
V.S.P.M.D.C.R.C. Nagpur

## Introduction

Perforation through the floor of the pulp chamber into the furcation of any tooth is a serious problem, and is the most common cause for failure in root canal treatment. The outcome of the perforation repair is not a highly predictable procedure and sometimes may result in extraction of the tooth.

Knowledge, about the basic root canal anatomy and its variation is essential in achieving a higher percentage of success in endodontics. Access preparation is performed by a quantitative method involving the clinician's tactile perception.

Furcated bicuspid teeth as well as molars are both subject to this iatrogenic problem.



## Aim of the Study

The aims of the present study are-

- To determine the pulp chamber morphological measurements and,
- Find out whether the CEJ coincides with the roof of the pulp chamber of maxillary first premolars.

## Materials and Methods

60 CBVT X-ray of patients were collected from CBVT center (Genesis, Nagpur). Using the multi measurement option in the system the pictures were morphologically measured.

Six, direct measures were made for all the teeth,

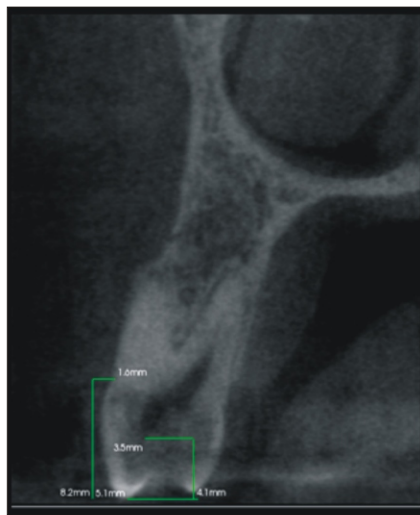
- Measurement A** represents the distance between the floor of the pulp chamber to closest point to furcation. (FIG-A)
- Measurement B** represents the distance between the roof of the pulp chamber to

closest point to furcation. (FIG-B)

- Measurement C** represents the distance from the buccal cusp tip to the furcation. (FIG-C)
- Measurement D** represents the distance from the buccal cusp tip to the roof of the pulp chamber. (FIG-D)
- Measurement E** represents the height of the pulp chamber. (FIG-E)
- Measurement F** represents the distance between buccal cusp tip and CEJ. (FIG-F)

## The Relationship of the Cemento-Enamel Junction to the Roof of the Pulp Chamber

The distance between the cusp tip and CEJ was measured. (F) Then the distance between cusp tip and to the roof of the pulp chamber was measured (D) Both the values were compared. The descriptive statistics has been done.



N-60	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)
Mean	6.7	11.5	15.4	4.8	3.2	4.7
SD	2.1	2.9	1.9	1.3	0.9	1.3
% of Variance	32.34	25.66	12.38	28.75	30.18	27.4

## Results : ( Mean morphological measurement)

N-60	Distance between cusp tip & cemento- enamel junction (mm) (Radiographically) (F)	Distance between cusp tip to roof of the pulp chamber (mm) (Radiographically)(D)
<b>Mean</b>	4.7	4.8

## Discussion

- A proper access cavity is the gateway for successful endodontic treatment. Errors like perforation occur while trying to locate the canals. Such errors can be avoided if the pulp chamber morphological measurements are well understood. Oi.et.al used micro

computed tomography to reconstruct the three dimensional images of the pulp cavities of maxillary first premolar. IEJ 37, 46-51, 2004.

- The measurements they made were of the volume ratios of the pulp chamber and the diameter of the root canal orifices. They found that the mesial-distal width and the height of the pulp cavity decreased with age. Krasner and Rankow described qualitative observations regarding anatomic patterns and relationship of the pulp chamber floor to the tooth and canals. (JOE-2004,30,5-16)
- Chai and Thong measured the width of the buccal and lingual walls in C shaped molars in assessing risk of perforations. (JOE 2004, 30,509-12)
- Ponce and Fernandez histologically evaluated the localization of CDJ and the diameters of the apical foramen and the root canal at the CDJ, to achieve a better understanding of these structures. (JOE 2003,29,214-9)
- According to Deutsch and Musikant-
- The distance from the midpoint of a line connecting the two cusp tips and closest point to furcation is 11.55mm,
- Mean distance from the midpoint of a line connecting the two cusp tips and to the roof of the pulp chamber is 6.94mm,
- Height of the pulp chamber is 2.76mm. Joe 2004,30,6,388-90
- In our study done, the distance from the midpoint of a line connecting the two cusp tips and closest point to furcation is - 15.4mm,
- Mean distance from the midpoint of a line connecting the two cusp tips and to the roof of the pulp chamber is - 4.8mm,

- Height of the pulp chamber is- 3.2mm. The coefficient of variation (CV) was also calculated. If the access opening burs goes beyond 4-5mm the floor of the pulp chamber can be gauged or perforated.

Detusch and Musikant reported the roof of the pulp chamber coincides with the level

Continued on Page 29



# Central Giant Cell Granuloma of Mandible : A Case Report

**Dr. Bhushan Bhagat**  
P.G. Student

**Dr. D.G.Adwani**  
Professor & HOD

**Dr. M.V. Naphade**  
Professor

**Dr. Ankur Gupta**  
P.G. Student

Dept. of Oral & Maxillofacial Surgery, V.Y.W.S. Dental College & Hospital Amravati, India

## Abstract

A 30-year old male reported with central giant cell granuloma of mandible, the entire lesion was excised and curetted keeping the lower border of the mandible intact. The postoperative period was uneventful. The recall visit after 6 months showed good signs of healing and new bone formation especially at the lower border and angle of mandible which were badly affected.

**Keywords:** Central Giant Cell Granuloma, Curettage, Mandible

**Introduction:** Central giant cell granuloma (CGCG) was defined by WHO<sup>1,4</sup> and described by Jaffe<sup>2</sup> in 1953. This lesion is more common in the mandible than the maxilla.<sup>4,6,7</sup> The pathogenesis of CGCG is not completely understood.<sup>1,4</sup> Lesions show aggressive growth, pain, paraesthesiae, massive swelling, root resorption, cortical perforation.<sup>1,4-6</sup> Non-aggressive and aggressive lesions can be differentiated by clinical signs, symptoms and radiological features.<sup>4,5</sup> Early diagnosis there is no strict criteria in an individual patient to differentiate between the 2 subforms. The histomorphometric analysis proved a significant increase in large giant cells, fractional surface area and mitotic activity in aggressive CGCG lesions.<sup>1,3</sup> Immunohistologic investigation (Ki-67 and p53 stain) revealed no significant differences.<sup>1</sup> The treatment of choice is conservative excision by curettage.<sup>4,7</sup> For aggressive lesions, supplementary treatment with calcitonin gives good results.<sup>4</sup>

**Case Report :** A 30-year old male reported with the complaint of facial swelling of the right side. The patient gave a history of extraction of right lower posterior teeth a few months previously due to their mobility. The swelling had slowly increased in size for the last 9-12 months and extended posteriorly from right first mandibular premolar to the ascending ramus. The growth was firm and non-tender with expansion of buccal cortical plate. The oral hygiene was fair and rest of the dentition was normal. Radiologically, Orthopanto-mograph (OPG) showed a well defined radiolucent lesion extending from distal aspect of the first premolar to the posterior border of the ramus on right side (Fig. 1) which revealed central giant cell granuloma on biopsy. All routine hematological investigations, serum calcium and alkaline phosphatase were found to be within normal limits.

At operation, intra-orally, lesion extended superoinferiorly from the lower border of mandible to the upper one third of the ramus of the mandible. The lower border of mandible was quite thin and expanded inferiorly. Superiorly, the residual alveolar ridge was expanded (Fig. 2). The entire lesion was excised and curetted keeping the lower border of the mandible intact. The postoperative period was uneventful. The recall visit after 6 months showed good signs of healing (Fig. 3) and new bone formation (Fig. 4) especially at the lower border and angle of mandible which were badly affected. The tissue sent for histopathological examination (Fig. 5) confirmed the diagnosis

of central giant cell granuloma.

**Discussion:** In 1953, Jaffe gave the term "giant cell reparative granuloma" and distinguished this lesion from the giant cell tumor.<sup>2,4</sup> These lesions were not true neoplasms and represented a local reparative reaction.<sup>2,4,6,7</sup> WHO defined as an intraosseous lesion consisting of cellular fibrous tissue containing multiple foci of hemorrhage, aggregations of multinucleated giant cells, occasionally, trabeculae of woven bone.<sup>1,4</sup> Mandible is affected more than the maxilla<sup>4,6,7</sup> and can be confined to the tooth-bearing areas of the jaws.<sup>4,7</sup> It may occur with a rapid onset of pain, paraesthesia, root resorption, and tooth displacement.<sup>1,4,7</sup> This has capacity to expand or destroy surrounding bone, resulting in facial asymmetry.<sup>7</sup> Chuong et al. classified CGCG into aggressive and non-aggressive lesions.<sup>5</sup>

Curettage is the recommended simple treatment of choice for this lesion.<sup>4,6,7</sup> In our case Curettage was done and patient is disease free. Patient is followed for 6 months and now we are planning for prosthetic reconstruction.

**Conclusion:** Curettage can be simple treatment plan and but long term follow up is required.

**References :** References are available on request at [editor@healtalkht.com](mailto:editor@healtalkht.com)

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Fig. 1 Preoperative OPG

Fig. 2 - Preoperative lesion

Fig. 3 Post operative site

Fig. 4 Post operative OPG

Fig. 5- Histopathology slide of CGCG

Address for Correspondence : Dr. Bhushan Bhagat C/o Devidas Kadane Bhagyshri Colony Infront of Curkit House, Camp Area, Amravati. [bhagatbhushan10@gmail.com](mailto:bhagatbhushan10@gmail.com)

## Continued Page of 19

Rathi, et al. : Evaluation of the Pulp Chamber Morphological Measurements in Maxillary First Premolar - A Cone Beam Volumetric Analysis

of the CEJ in 96% of specimens.

In our study 95 % of the specimens roof of the pulp chamber coincides with the CEJ.

## Conclusion

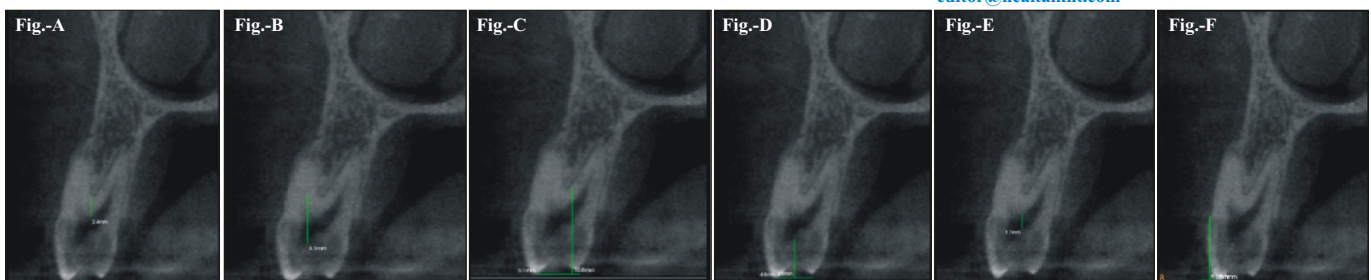
Morphological measurements of maxillary premolar in our study was-

- Distance from the floor of pulp chamber
- to furcation -6.7mm +/- 2.1
- Distance from the roof of the pulp chamber to furcation 11.5mm +/- 2.9
- Distance from the buccal cusp tip to the furcation of the pulp chamber- 15.4mm +/- 1.9
- Distance from the buccal cusp tip to the

- roof of the pulp chamber- 4.8mm +/- 1.3
  - Height of the pulp chamber- 3.2mm +/- 0.9
- In maxillary 1st premolar the CEJ coincides in 95 % of the specimens with the roof of the pulp chamber.

## References

References are available on request at [editor@healtalkht.com](mailto:editor@healtalkht.com)



Address for Correspondence : Dr. Shravan S. Rathi, Private Practitioner (Endodontics), Aashish Bunglow, Near Dr. Barabde Hospital, Amravati. [shravan.rathi@gmail.com](mailto:shravan.rathi@gmail.com)



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29