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## Three Rooted Maxillary First Premolar - An Unusual Occurrence.

Raghavendra Jayesh<sup>1\*</sup>, Masthan KMK<sup>2</sup>, Nalini Aswath<sup>2</sup> and Aravindha Babu N<sup>3</sup>

<sup>1</sup>Department of Prosthodontics, Sree Balaji Dental College & Hospital, Bharath University, Chennai. Tamil Nadu, India.

<sup>2</sup>Department of Oral Medicine, Diagnosis and Radiology, Sree Balaji Dental College & Hospital, Bharath University, Chennai. Tamil Nadu, India.

<sup>3</sup>Department of Oral Pathology and Microbiology, Sree Balaji Dental College & Hospital, Bharath University, Chennai. Tamil Nadu, India.

### ABSTRACT

Premolars are the group of teeth with the largest variation in root number and form. Usually the maxillary first premolars present with two roots. The incidence of three roots is quite uncommon. A male patient aged 13 years visited the dental clinic with a chief complaint of misaligned teeth, for which the orthodontist advised routine fixed orthodontic appliance. Extraction of upper and lower first premolars was done for space creation. After extraction, all the first premolars were found normal except for the maxillary right first premolar, which had three roots. This article presents a relatively uncommon clinical case of maxillary first premolar with three roots.

**Key words:** anatomical variations, premolar, root morphology.

*\*Corresponding Author*

## INTRODUCTION

Anatomical variations of tooth need to be identified both clinically and radiographically [1]. Adequate familiarisation of tooth morphology is mandatory for such assessment. The morphology of premolars has been reviewed extensively. Previous studies have reported maxillary first premolar to be either single or multi-rooted [2]. The occurrence of one root has been reported to be about 40%, two roots - 56% and three roots about 0.5% to 6% [2, 3].

The anatomy of three rooted maxillary premolar resembles that of maxillary molars [3]. The maxillary first premolar typically has two well formed roots but three rooted maxillary first premolars are uncommon and frequently have one canal in each root [3]. The length of the maxillary first premolar has been reported to range between 15.5mm-28.9mm [2].

Clinical management involving maxillary first premolar teeth with unpredictable root morphology may pose some challenges that include difficulty in dental extraction, orthodontic movement and frequent failure of endodontic treatment [1]. This article is a case report of an anatomical variation of maxillary first premolar tooth.

## CASE REPORT

A 13-year old male patient visited the dental clinic with the complaint of misaligned teeth. His past medical & dental history were non-contributory. On clinical examination, all natural teeth were present except the third molars in all quadrants. OPG and Lateral cephalogram were advised and study casts were prepared (Figure 1a and 1b). Extraction of all maxillary and mandibular first premolars was decided prior to orthodontic treatment.

Upon extraction, all the first premolars were found to possess normal morphology except the maxillary right first premolar which had three roots. The dental model of the patient, macroscopic appearance, radiographic illustrations are given in figure 1a and 1b, figure 2a, 2b, 2c and 2d and figure 3a and 3b respectively.

**Figure 1: The dental cast model of the patient showing normal morphology of the premolars.**

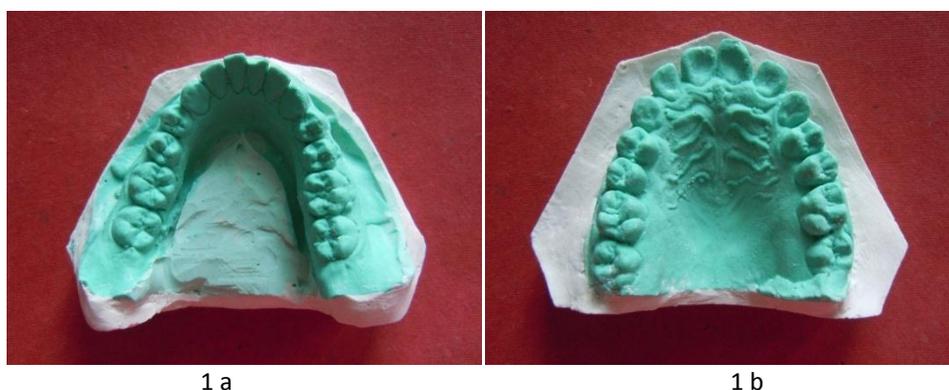


Figure 2: Macroscopic view of the extracted maxillary first premolar showing three roots in various angles.

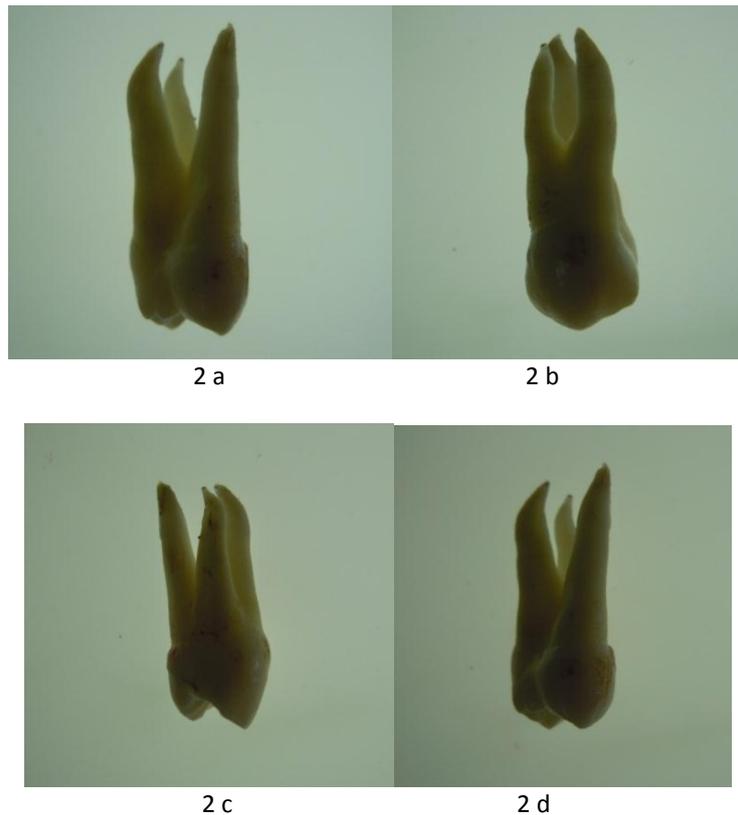
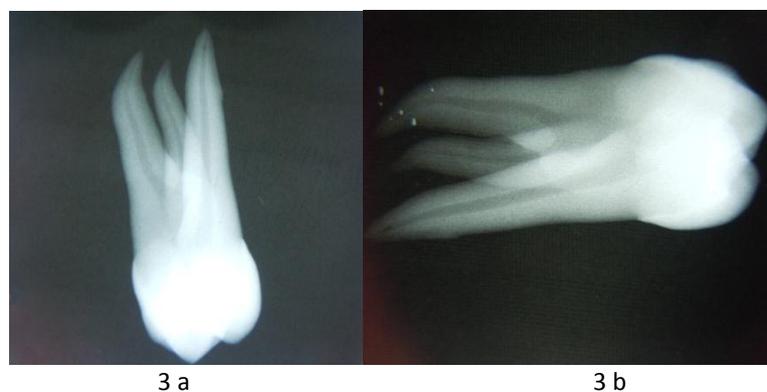


Figure 3: The radiograph of the extracted premolar revealed three distinct canals in the three roots.



## DISCUSSION

Morphological variations of teeth could be either in the coronal aspect or in the root. The tooth root formation takes place only after the crown formation has been completed. The transition from outer to inner layer of the enamel organ lengthens and forms one, two or three root canals. In the fold, between the inner and outer enamel epithelium no enamel is produced – the two layers lie closely on one another. This region is also known as Hertwig's epithelial sheath. The role of Hertwig's epithelial root sheath (HERS) cells in root formation is widely accepted [5]. However, the precise function of these cells remains controversial [5].

Supernumerary root is an extra root or roots found in teeth. According to a study by Brook, supernumerary teeth were present in 0.8% of primary dentitions and in 2.1% of permanent dentitions [10]. The most common teeth involved are mandibular canines, premolars and molars. Canines and most premolars, except for maxillary first premolars usually have one root. Maxillary first premolars and mandibular molars usually have two roots. Maxillary molars usually have three roots. When an extra root is found in any of these teeth, the root is described as a supernumerary root.

Etiology of the supernumerary root has not been precisely found out. Abnormal division during development of tooth, hyperactivity of the dental lamina and heredity are some of the implicated reasons. Some authors suggest that supernumerary root can also arise due to dichotomy of the tooth bud [7- 9].

Clinical significance of supernumerary root if present causes difficulty in extraction and endodontic management. In three rooted maxillary premolars, the buccal orifices are close to each other that are hard to locate. Higher magnification and illumination can be useful for access cavity preparation, instrumentation and obturation [6]. It can improve the clinician's view of the complexity of the root canal anatomy and aid in location of additional canals [6]. Thin roots and curvature in the apical 1/3<sup>rd</sup> make it more vulnerable to fracture. The maxillary first premolar is prone to fenestration and dehiscence and therefore caution must be exercised during extraction/endodontic procedures.

### CONCLUSION

The incidence of three rooted maxillary first premolar is rare. However, high quality preoperative radiographs and their careful examination prove essential for detection in some cases. When confronted with unusual tooth anatomy such as three rooted maxillary first premolars, good illumination, magnification and careful extraction will make dental treatment easier.

### REFERENCE

- [1] Charles Mugisha Rwenyonyi, Annet Kutesa, Louis Muwazi, William Buwembo. *Open J Stomatol* 2011; 1:7-11.
- [2] Nganga R.N., Masiga M.A., Maina S.W. *East African Med J* 2009; 86(12):539-544.
- [3] Venugopal Naveenkumar, Krishnamurthy Madhuram, Chakravarthi Dhanavel. *J Contemp Dent* 2011; 2(3):109-111.
- [4] Kahn, Michael A. *Basic Oral Maxillofacial Pathology* 2001; vol.1
- [5] Zeichner-David Margarita, Oishi Keiji, Zhengyan Su, Zakartchenko Vassili, Chen Li-Sha, Arzate Higinio, Bringas Pablo. *Developmental Dynamics*, 2003; 228(4): 651-663.
- [6] Hacer Deniz Arizu, Tayfun Alacam. *European J Dent* 2009;3:62-66.
- [7] Therese Garvey. M, Hugh J. Barry, Marielle Blake. *J Can Dent Assoc* 1999; 65:612-6
- [8] Liu JF. a survey of 112 cases. *ASDC J Dent Child* 1995; 62:262-5.
- [9] Levine N. *J Can Dent Assoc* 1961; 28:297-303.
- [10] Brook AH. *J Int Assoc Dent Child* 1974; 5: 37-53.