ABSTRACT
Before endodontic therapy is performed the clinician should know the number of roots and canals of the tooth that is to be treated. False assumptions about root canal morphology may lead to incomplete debridement and obturation of the root canal space eventually leading to endodontic failures.

Access cavity modification may be required for stress free anatomic manipulations. Coupled with the sound knowledge of root canal anatomy is the use of higher magnification that can bridge the gap between oneself and higher percentage of successful endodontic treatment. This rare case report discusses the diagnosis and treatment of a three rooted maxillary first premolar.

Key words: Anatomical variations, maxillary first premolar, three roots

INTRODUCTION
Many of the difficulties encountered in root canal treatment are due to the variations in the root canal morphology. Extra roots are an additional challenge and involves all the operative stages, including cavity design, canal access, localization, cleaning and shaping followed by obturation of the root canal system.

The maxillary first premolar has two cusps, with the buccal cusp prominently larger than the palatal cusp. maxillary first premolar has been shown to exhibit three roots in 0.5-6% of the cases. In the case of the second premolar there has been a lower incidence of three root canals between 0.3-2%. Hence it is very imperative to diagnose the case from the pre-operative X-ray.

The anatomy of maxillary premolars with three canals, mesio buccal, distobuccal and palatal is similar to the adjacent maxillary molars and they are sometimes small molars or ‘radiculous’.

Since the pre-operative radiographs gives a two dimensional view of a three dimensional object an abrupt straightening or loss of a radiolucent canal in the pulp cavity should suggest an extra canal. In straight on radiographs, Sieraski et al found out that whenever the mesio distal width of the midroot image was equal to or greater than the midroot image of the crown the tooth most likely had three roots. Based on these studies the following case was approached.

CASE REPORT
A 32 year old female patient with a non contributory medical history reported to the Department of Conservative Dentistry and Endodontics with pain in the upper left posterior tooth region. Pain was of dull intensity and radiating to the left zygomatic and temporal region on chewing. Patient reported a history of composite
restoration in relation to the upper left maxillary premolar 2-3 months back. On examination there was an improperly contoured disto-occlusal composite restoration in relation to 24 and the tooth was tender to percussion. Patient also reported increased sensation to hot and cold foods. A pre-operative radiograph showed that the restoration was in close proximity to the pulpal horn.

Pulp Space Therapy was initiated under rubber dam and access opening revealed three canals. The access opening was modified to a triangular outline for proper visualization of the canals (Fig1). K files #15 were placed in all the three canals and working length radiograph was obtained (fig2). Biomechanical preparation was carried out in the first visit using the crown down technique.

Coronal flaring was carried out using the Gates Glidden Drill nos 1-3 followed by SX of the Protaper Kit (Dentsply). Copious irrigation was done using 2.5% hypochlorite and saline. RC prep (Septodont) was used as the lubricating agent since the canals were fine towards the apex. Closed dressing of Cavit G (3M ESPE) was placed and patient was recalled after 2-3 days.

On recall the tooth was asymptomatic. Biomechanical preparation was completed till F1 of the Protaper kit. The preparation was further refined using #20 H file. Obturation was done using F1 protaper GP points and Zinc Oxide Eugenol as sealer (Fig 3). Post endodontic restoration was also placed on the same day.

DISCUSSION

Several studies have shown differences in the external and internal anatomy of the maxillary first premolar. Such variations affect clinical practice and clinicians should be aware of the variations due to race, ethnicity etc.

A study by Momen on Saudi population showed that of the 246 extracted first premolar teeth that were studied only 1.2% showed three roots.

When confronted with unusual anatomy as the three rooted maxillary premolar magnification can make things better. Carr affirms that the operating microscope improves the ability of the endodontist to visualize and treat aberrant canal anatomy.

A case report by J.A. Soares and R.T. Leonardo shows a case report in which a maxillary first and second premolar with three roots were identified and treated.

A recent case report by Hacer Deniz Arisu and Tayfun Alacam also shows the identification and treatment of three rooted maxillary first premolars.
CONCLUSION

This case report is yet another depiction of the anatomical variations in the root canal system and goes to underline the fact that thorough knowledge of the root canal along with proper access cavity can lead to decrease in the percentage of root canal failures.

References:
1. Ash and Nelson : Dental anatomy 8th edition
7. Sieraski Sm et al. (1985) Identification and endodontic management of three rooted maxillary first premolar. JOE 15, 29-32