

## An Unusual Entity of Three Canals in a Maxillary Canine: A Case Report.

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### Abstract:

To highlight a rare anatomical variation in a maxillary canine. Human teeth do not present an internal anatomy as simple as could be expected, there are such teeth with extra canals. Maxillary canines can present an internal anatomy with three canals. The existence of maxillary canine with one root canal is commonly seen, but a fact that more than one canal needs to be kept in clinicians mind. Upon a quick glance at literature, it has been noted that very few root canal complexities in maxillary canines have been reported. This case report presents detection, shaping and cleaning and obturation of a permanent left maxillary canine which is single rooted having three canal orifices (Buccal, Palatal and Midbuccal). Midbuccal joining at the middle third and palatal joining at the apical third, before exiting with a single apical foramen.

**KeyWords:** Endodontic treatment, Maxillary Permanent Canine, Root canal anatomy, 3 root canals

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### I. Introduction

Diagnosis and identification of the root morphology is the sole key factor of endodontic treatment.<sup>1,2</sup> Maxillary canines are considered to be single-rooted, single-canaled teeth and two root canals in a permanent canine is a rare entity. The anatomy of root canal systems states the condition under which root canal therapy is carried out and can directly affect its prognosis. Extra root canals if not detected are a major reason for failure of endodontic therapy. The pulp canal system in any tooth has the potential of being very complex with divisions throughout the length of the root.<sup>3,4</sup>

Vertucci classified the root canal configurations of human permanent teeth into various types ranging from single to three separate and distinct canals.<sup>4</sup> In mandibular anterior teeth, the prevalence of two or three root canals has been reported to be as low as 1% and as high as 43%.<sup>5</sup> The prevalence of two canals in maxillary canine is said to be 2-3%.<sup>6</sup>

Maxillary canines are considered to be single-rooted, single-canaled teeth and two root canals in a permanent maxillary canine is a rare condition.<sup>7,8,9</sup> Multiple canals and multiple roots of maxillary anterior teeth with or without any developmental anomalies have been reported.<sup>10</sup> In this report, we describe a case of three canals in a single rooted maxillary canine.

### II. Case report

A 38-year-old female patient was reported to Department of Conservative Dentistry and Endodontics, The Oxford Dental College, Bangalore, with a chief complaint of pain in the upper front region of the jaw for the past 1 week. On clinical examination, tender on percussion was noted irt. 23. On radiographic examination the tooth shows radiolucency involving enamel, dentin and pulp. Periapically widening of pdl seen suggestive of apical periodontitis.

Local anesthesia was administered and a medium thickness rubber dam of 6 × 6 inches (Hygienic; Coltene Whaledent) was placed to isolate tooth #23. Access to the pulp canal space was achieved using a round diamond bur (ISO 801001016, Komet, and Lemgo, Switzerland). Further modification and exploration in the

access cavity demonstrated the presence of a different canal orifice, lying buccal and midbuccal to the main canal. Working length was determined by placing K file # 15 in palatal canal using apex locator (Tri auto ZX ,J morita; USA) and K file # 10 was placed in the buccal and midbuccal canal, radiographic image was taken, it was found that the palatal canal joined the buccal canal just in the apical third of the root and midbuccal at the middle third. The canals were cleaned and shaped with Hyflex instruments using Endomotor (Densply X- Smart endomotor). One milliliter of 1.25% NaOCl was used for irrigation between each instrument. After the final irrigation the canals were dried with paper points and obturated using single cone technique with Gutta percha using AH Plus sealer.



Fig 1: Pre operative radiograph irt 23



Fig 2: Working length determination irt 23



Fig 3: Clinical picture with rubber dam isolation irt 23



Fig 4: Master cone placement irt 23



Fig 5: Obturation irt 23

### III. Discussion

During the past years, there have been many studies on pulp morphology. However two studies have reported that maxillary canine is composed with two canals in the possibility of ranges approximately 2-3% as below as table.<sup>11,12,13,14</sup> However, there is no case report of maxillary canine with three canals.

During the past years, there have been many studies on pulp morphology as follows:

AUTHOR	ONE CANAL	TWO CANALS
Pineda & Kuttler (1972)	100%	0%

Vertucci (1984)	100%	0%
Çalişkan et al. (1995)	97.83%	2.17%
Weng et al. (2009)	96.95	3.10%

The percentage of permanent maxillary canines in Indian population other than Type I are found to be<sup>15,16</sup>

Type III	11.6%
Type II	2.8%
Type V	2%
Type XIX	1.2%
Type IV	0.8

The objectives of root canal treatment are to debride the root canals of pulp tissue remnants, microorganisms and bacterial products prior to obturation, thus inducing a favorable environment for healing of periradicular tissues.<sup>17</sup>

Failure to locate and obturate a canal has been demonstrated to be a causative factor in the failure of endodontic therapy. It is of utmost importance that all canals be located and treated during the course of nonsurgical endodontic therapy. Although the prevalence of the root canal anomalies is rare, they can be detected by careful examination.<sup>18,19</sup>

A thorough knowledge of the root canal anatomy is essential for successful treatment. In addition, a careful endodontic exploration as well as radiographs from several different angles or a cone beam computed tomography scan may lead to suspicion or identification of additional canals and is certainly essential to give the highest possible chance for success.<sup>20,21</sup> Additional aids such as use of loupes or microscopes can also aid in successful root canal treatment.

#### IV. Conclusion

This case report increases the awareness of the clinicians and enlighten the various anatomical variations of teeth morphology.

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