

## Three-Rooted Mandibular Molars in Patients of Mongolian, Caucasian and Negro Origin

José Antonio Brufato FERRAZ  
Jesus Djalma PÉCORÁ

*Faculdade de Odontologia de Ribeirão Preto, Universidade de São Paulo  
Ribeirão Preto, SP, Brasil*

A total of 328 periapical x-rays from 105 patients of Mongolian origin, 106 of Negro origin and 117 of Caucasian origin were studied. The Mongolian race showed a greater incidence of three-rooted mandibular molars (15.2% of the Mongolian patients, 7.5% of the Negro patients and 6.8 of the Caucasian patients). There was no statistical difference in relation to sex and the incidence of this extra root.

**Key Words:** three-rooted mandibular molars, anatomy.

### Introduction

The anatomy of human teeth present racial variations which can lead to therapy failure when not recognized. The failure of localization, instrumentation, and obturation of a root canal leads to problems which could be avoided.

Pucci and Reig (1944) verified an incidence of 5.5% of mandibular molars with 3 roots in a sample of teeth from the population of Uruguay. De Deus (1960) reports an incidence of 2.5% of these molars with 3 roots in a sample of teeth from patients in Southeastern Brazil. Teixeira (1963), citing an incidence of 10%, reported this extra root to be smaller than normal roots and in the disto-lingual position. Sousa-Freitas et al. (1971), using radiographic examinations, observed a presence of 17.8% of the mandibular first molars with 3 roots in patients of Japanese descent and of only 4.3% in patients of European descent. According to a review of the literature, a high incidence of mandibular molars with three roots is found in people of Mongolian origin (Japanese, Malaysian, Chinese, Thai, Eskimo, Aleutian, American Indian) (Tratman, 1938; Curzon, 1971; Jones, 1980; Reichart and Metah, 1981; Walker and Quackenbush, 1985). The literature is lacking in studies about the incidence of this racial anatomic alteration in Brazil.

The objective of this research was to verify the incidence of three roots in human mandibular molars in patients of Mongolian, Caucasian (white) and Negro origin in the region of Ribeirão Preto, São Paulo, Brazil.

## Material and Methods

A total of 328 periapical x-rays from 105 patients of Mongolian origin, 106 of Negro origin and 117 of Caucasian origin were analyzed. The molars were x-rayed by the long cone technique using a Dabi-Atlante (Ribeirão Preto, Brazil) x-ray machine with a 70-Kvp capacity. Kodak Ultraspeed films were used. For analysis of the x-rays, a negatoscope and a 4X lens were used. When the x-ray was not clear, a new one was taken changing the horizontal angle. Racial origin and sex were recorded.

## Results

The presence of 3 roots in mandibular molars was confirmed in 16 patients of Mongolian origin (15.2%), in 8 patients of Negro origin (7.5%) and in 8 Caucasian patients (6.8%) (Table 1). There was a statistically significant difference ( $P < 0.01$ ) in the incidence in the Mongolian race compared to the Negro and Caucasian races, which were statistically similar.

Table 1 - Mandibular molars with three roots found in patients of Mongolian, Caucasian and Negro origin.

Number of patients	Race	Molar			Total	%
		First	Second	Third		
105	Mongolian	12 (11.4%)	3 (2.8%)	1 (0.9%)	16	15.2%
106	Negro	3 (2.8%)	2 (1.8%)	3 (2.8%)	8	7.5%
117	Caucasian	5 (4.2%)	2 (1.7%)	1 (0.8%)	8	6.8%

The incidence of three-rooted mandibular molars in male and female patients is shown in Table 2 according to racial origin. No significant statistical difference between males and females was found (Fisher test).

Table 2 - Incidence of mandibular molars with three roots according to race and sex.

Race	Sex		Total
	Male	Female	
Mongolian	5	11	16
Negro	5	3	8
Caucasian	2	6	8
Total	12	20	32

The incidence of first molars with three roots was 11.4% in patients of Mongolian origin, 2.8% in Negro patients and 4.2% in Caucasian patients.

The x-ray shown in Figure 1 is from a Caucasian patient whose mandibular first right molar had 3 roots and 4 root canals.

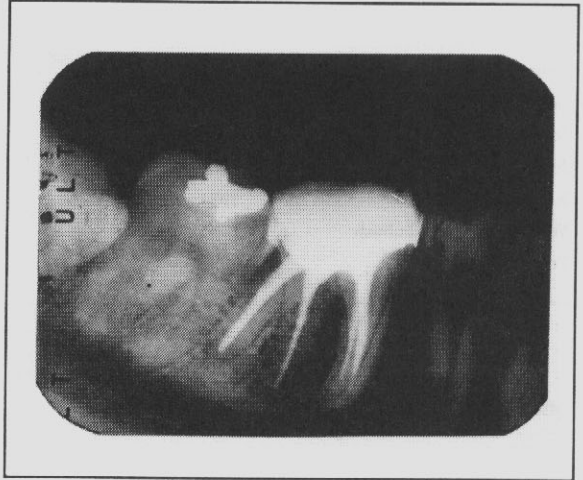


Figure 1 - Radiograph of a mandibular first molar with three roots and four root canals. The third root is located in the disto-lingual position.

## **Discussion**

The incidence of mandibular molars with three roots is high in people of Mongolian origin; however, it is also present in patients of Negro and Caucasian origin. This root is found in the disto-lingual position of mandibular molars.

Since the world today is no longer formed by races which do not mix, the dental surgeon must be aware of racial anatomical variations since he may see patients of diverse origins daily. In the region of Ribeirão Preto, Brazil, it is common to perform endodontic treatment on patients of Japanese, Chinese, Korean, White and Negro origin.

Table 3 shows the incidence of mandibular first molars with three roots in people of Mongolian origin reported in the literature. This table reports the possibility of these findings in a simple manner.

De Deus (1960) reported an incidence of mandibular first molars with 3 roots of only 2.5%, Teixeira (1963) reported 10% and Sousa-Freitas et al. (1971) observed 4.7%. We found an incidence of 4.2% in patients of Caucasian origin. In Negro patients, with an incidence of 7.5% of three-rooted mandibular molars, we found an incidence of 2.8% of first molars with 3 roots. The presence of 3-rooted mandibular molars is greater in patients of Mongolian origin but this does not lessen the importance of the occurrence in Negro and Caucasian patients.

Table 3 - Incidence of mandibular first molars with three roots in patients of Mongolian origin reported in the literature.

Authors	Year	Origin	%
Tratman	1938	Malaysian	12%
Tratman	1938	Chinese	8%
Curzon	1971	Eskimo	12.5%
Sousa-Freitas et al.	1971	Japanese descent	22.7%
Somogyi	1971	American Indian	16%
Jones	1980	Chinese	13.4%
Jones	1980	Malaysian	16%
Reichart and Metah	1981	Thai	19.2%
Walker and Quackenbush	1985	Chinese (Hong Kong)	14.5%
Present study	1992	Japanese descent	11.4%

It was not possible to verify the bilateral incidence since the patients studied lacked one or more mandibular molar.

### Conclusions

1. The incidence of three-rooted mandibular molars is 15.2% in patients of Mongolian origin.
2. Negro patients presented an incidence of 3-rooted molars of 7.5%.
3. Caucasian patients (white) presented an incidence of 3-rooted mandibular molars of 6.8%, with 4.2% being first molars.
4. There was no statistical difference in the incidence of this dental anomaly in relation to sex.

### References

- Cruzon MEJ: Three-rooted mandibular permanent molars in the Keewatin Eskimo. *Can Dent Assoc* 37: 71-73, 1971
- De Deus QD: Topografia da cavidade pulpar. Contribuição ao seu estudo. Doctorate thesis, Belo Horizonte, 1960
- Jones AW: The incidence of the three-rooted lower first permanent molar in malay people. *Singapore Dent J* 5: 15-17, 1980
- Pucci FM, Reig R: *Conductos Radiculares*. Barreiro Y Ramos Montevideo, Vol I, 1944
- Reichart PA, Metah D: Three-rooted permanent mandibular first molars in the Thai. *Community Dent Oral Epidemiol* 9: 191-192, 1981
- Somogyi CW: Three-rooted mandibular first permanent molar in Alberta Indian children. *Can Dent Assoc* 37: 105-106, 1971

- Sousa-Freitas JA, Lopes ES, Casati-Alvares L: Anatomic variations of lower first permanent molar roots in two ethnic groups. *Oral Surg* 31: 274-278, 1971
- Teixeira LD: *Anatomia dentária humana*. Imp Univ Minas Gerais, Belo Horizonte, 1963
- Tratman EK: Three-rooted lower molars in man, and their racial distribution. *Br Dent J* 64: 264-267, 1938
- Walker RT, Quackenbush LE: Three-rooted lower first permanent molars in Hong-Kong Chinese. *Br Dent J* 159: 298-299, 1985

**Correspondence:** Professor Jesus Djalma Pécora, Departamento de Odontologia Restauradora, Faculdade de Odontologia de Ribeirão Preto, USP, 14049-904 Ribeirão Preto, SP, Brasil.

**Accepted October 7, 1992**