

Clinical Evaluation of Tooth-Size Discrepancy

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This article shows a simple method of performing a preliminary tooth-size discrepancy analysis during the clinical examination.

Anterior Analysis

Have the patient move the mandible into an edge-to-edge relationship, so the mesial surfaces of the mandibular lateral incisors are aligned with those of the maxillary lateral incisors (Fig. 1). Visually compare the widths of the lateral incisors.

Using the appropriate tooth-size ratios from the data of Moorrees,¹ Moyers,² or Richardson³ (Table 1), determine the relative excess of maxillary or mandibular tooth structure (Fig. 2). Both the Moorrees and Moyers measurements of North American whites indicate that the maxillary lateral incisor is 12-14% wider than the mandibular lateral incisor. Richardson's analysis of African-Americans shows a slightly greater differential.

By keeping these size differences in mind while performing the clinical examination, the orthodontist can perform an "instant" tooth-size analysis. If the maxillary lateral incisor is smaller than, the same size as, or less than .7mm wider than the mandibular lateral incisor, then the preliminary finding would be a relative excess of mandibular anterior tooth structure. The patient can be made aware of the potential problem at the examination visit, and treatment methods for resolving the tooth-size discrepancy can be discussed.

Posterior Analysis

A similar clinical evaluation of posterior tooth-size discrepancy can be made for a Class I or Class II patient who has reasonably well-aligned posterior teeth, and whose mandible can be positioned so that the mesiobuccal cusp of the maxillary first molar is centered over the buccal groove of the mandibular first molar. This assessment should be made on both sides.

A Class I canine relationship, with the maxillary canine vertically aligned over the embrasure between the mandibular canine and first premolar, indicates a balance of posterior tooth structure (Fig. 3A). If the tip of the maxillary canine is mesial to the mandibular canine-premolar embrasure, there is a relative excess of maxillary posterior tooth structure (Fig. 3B). If the tip of the maxillary canine is distal to the mandibular embrasure, there is a relative excess of mandibular posterior tooth structure (Fig. 3C).

Limitations

This technique does not consider the influence of other teeth, such as maxillary central incisors, that may be larger or smaller than normal. Only complete measurements can account for all possible discrepancies.

Crowding or rotations of the posterior teeth will invalidate the "instant" posterior tooth-size analysis. The evaluation cannot be performed on a severe Class II or Class III patient who is unable to bring

the first molars into a Class I alignment by posturing the mandible. □

FIGURES

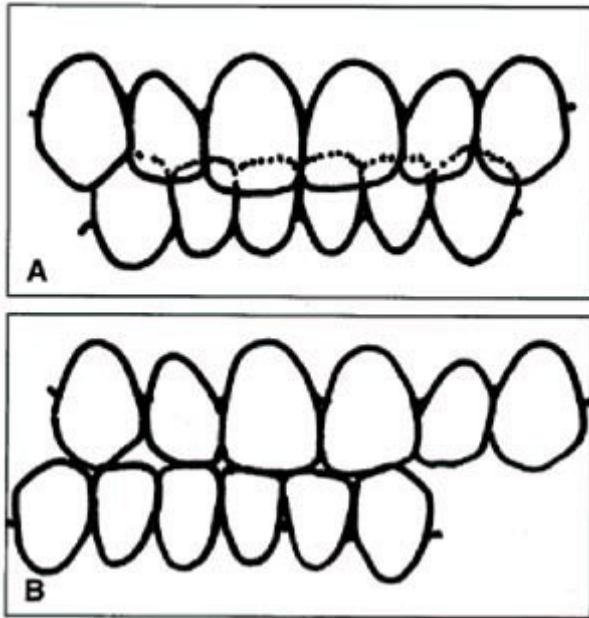


Fig. 1 A. Ideal size and alignment of six anterior teeth. B. Mesial surfaces of maxillary and mandibular right lateral incisors aligned by having patient shift mandible slightly forward and right.

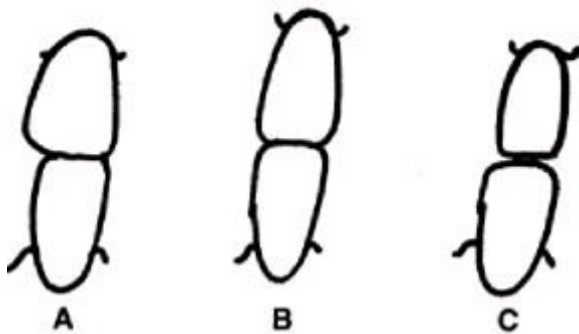


Fig. 2 A. Ideal mesiodistal crown relationship of maxillary and mandibular lateral incisors. B. Small maxillary lateral incisor indicates relative excess of mandibular tooth structure. C. Peg-shape maxillary lateral incisor indicates severe relative excess of mandibular tooth structure.

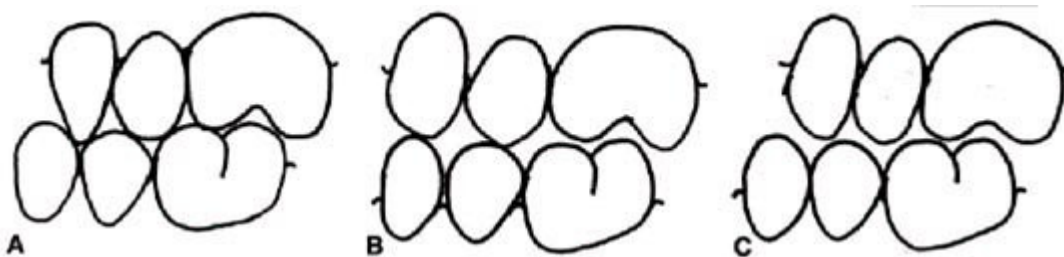


Fig. 3 A. Ideal mesiodistal crown relationship of maxillary and mandibular premolars and first molars. B. Relative excess of maxillary posterior tooth structure. C. Relative excess of mandibular posterior tooth structure.

TABLES

TABLE 1
MESIODISTAL CROWN DIAMETERS OF PERMANENT LATERAL INCISORS (MM)

	Arch	Males			Females		
		Mean	S.D.	Diff. Ratio	Mean	S.D.	Diff. Ratio
<i>North American Whites</i>							
(Moorrees)	Maxillary	6.64	0.63	<u>0.69</u>	6.47	0.62	<u>0.69</u>
	Mandibular	5.95	0.38	1.12	5.78	0.38	1.12
(Moyers)	Maxillary	6.88	0.64	<u>0.84</u>	6.78	0.64	<u>0.86</u>
	Mandibular	6.04	0.37	1.13	5.92	0.34	1.14
<i>North American Blacks</i>							
(Richardson)	Maxillary	7.26	0.64	<u>1.13</u>	7.08	0.56	<u>1.09</u>
	Mandibular	6.13	0.44	1.17	5.99	0.46	1.18

Table. 1

REFERENCES

- 1 Moorrees, C.F.A.: The Dentition of the Growing Child, Harvard University Press, Cambridge, MA, 1959, p. 82.
- 2 Moyers, R.E. et al.: Standards of Human Occlusal Development, Monograph 5, Craniofacial Growth Series, Center for Human Growth and Development, University of Michigan, Ann Arbor, 1976, p. 45.
- 3 Richardson, E.R. and Mathotra, S.K.: Mesiodistal crown diameter of the permanent dentition of American Negroes, Am. J. Orthod. 68:157-164, 1975.