



**ORIGINAL RESEARCH PAPER**

**Dental Science**

**PERICEMENTAL ABUTMENT SUPPORT IN FIXED DENTAL PROSTHESIS**

**KEY WORDS:** Pericemental area, crown-root ratio, occlusion

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**ABSTRACT**

**Background:** The occlusal stress the fixed dental prosthesis faces during various oral functions like mastication, swallowing, phonation is dissipated via periodontium of the supporting abutments. Healthy and large pericemental area of the abutments increases the clinical longevity of the fixed dental prosthesis.

**Ante's law:** This concept was formulated by Irwin Ante in 1926 which helps in deciding the amount of bony support needed to support the fixed dental prosthesis. The authors that adopted and reinforced this law are Johnston, Dykema, Shillinburg and Tylman.

**Definition:** He postulated that the sum of pericemental area of abutment teeth should be equal or surpass that of the teeth being replaced.

**Definition according to GPT:** "In fixed partial denture prosthodontics for observation that the combined pericemental area of all the abutments supporting a fixed partial denture should equal or greater in pericemental area than the tooth or teeth being replaced; as formulated for removable partial prosthodontics the combined pericemental area of the abutment teeth plus the mucosal area of denture base area should be equal or greater than the pericemental area of the missing teeth."

Jespen measured average root surface areas to calculate abutment to pontic ratio. A ratio of 1:1 or greater will satisfy " ANTE'S LAW".

**Table1. Root surface areas of maxillary and mandibular teeth is as**

	Maxillary teeth (mm <sup>2</sup> )	Mandibular teeth (mm <sup>2</sup> )
Central incisor	204	154
Lateral incisor	179	168
canine	273	268
First premolar	234	180
Second premolar	220	207
First molar	433	431
Second molar	431	426

Factors modifying Ante's Law:

- a. Increase the number of abutments for support when
  - i. Loss of bone due to periodontal disease
  - ii. Changes in axial inclination that is mesial or distal tipping of the abutments
  - iii. Endodontically treated teeth with root resection
  - iv. Tooth mobility created after osseous surgery
  - v. Arch form situations creating leverage factors
- b. Decrease the number of abutments for support when
  - i. Mesial migration of the abutment teeth

Factors that a restoring dentist must consider along with Ante's recommendations made in 1926 are as under

- i. Crown – root ratio
- ii. Root morphology
- iii. occlusion

- i. **Crown-root ratio:** Crown- root ratio of an abutment that supports for fixed dental prosthesis is
  - a. Ideal when 1:2,
  - b. Optimum when 2:3 and
  - c. Favorable when 1:1

Decrease in alveolar bone height increases leverage forces imposed on the abutment that minimizes clinical longevity of the fixed dental prosthesis.

- ii. **Root morphology:**
  - a. Teeth with short, conical and blunted roots offer poorest support.
  - b. Teeth with long, irregularly shaped, divergent roots offer best support for fixed dental prosthesis.
  - c. Teeth with periodontal bone loss exposing furcation, root concavities that complicates hygiene are less desirable as abutments.

**iii. Dental occlusion:** The dental occlusion is the most important parameter the restoring clinician must pay attention to. The unfavorable, damaging leverage forces must be mitigated by

- a. Programmed canine disocclusion,
- b. Narrow occlusal tables,
- c. Physiologic occlusal plane and
- d. Physiologic occlusal vertical dimension.

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