Can We Go Anti-Ante's Law?

Dr. Shashikala Jain
Professor & Head, Dept. of Prosthodontics
Surendera Dental College & Research Institute, Sri Ganganagar (Rajasthan)

Dr. Sanjay Jain
Dental Surgeon

If I ask any dentist a simple question

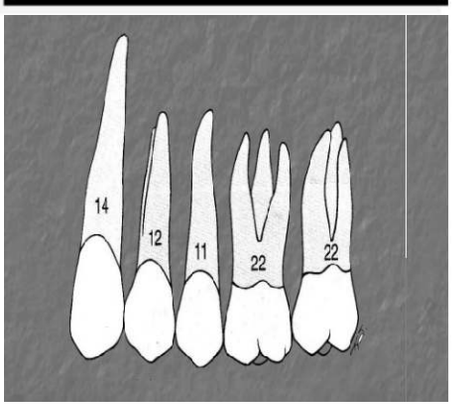
Can we go anti-ante's law? Anybody would surely say a big 'No'. That is exactly what I was told from the day one-whether it was my first fixed prosthodontic lecture or clinic and throughout my post graduate days it was all Ante's law for me. And as I followed this protocol I lost count of innumerable patients I diagnosed invalid for fixed prosthetics. Before we go into further discussion let's see what is Ante's Law.

Ante's Law

Irwin H. Ante, 1926 : an eponym in fixed partial denture for the observation that the combined pericemental area of all abutment teeth supporting a fixed partial

Root Surface Area (mm^2) of Abutment		Percentage Root Surface Area in Quadrant
MAXILLARY		
Central	204	10
Lateral	179	9
Canine	273	14
First premolar	234	12
Second premolar	220	11
First molar	433	22
Second molar	431	22
MANDIBULAR		
Central	154	8
Lateral	168	9
Canine	268	15
First premolar	180	10
Second premolar	207	11
First molar	431	24
Second molar	426	23

Data from Jepsen A: *Acta Odontol Scand* 21:35, 1963.



denture should be equal to or greater than the tooth or teeth to be replaced

According to this premise, one missing tooth can be successfully replaced by a fixed partial denture, if the abutment teeth are healthy. If two teeth are missing a fixed partial denture probably can replace the missing teeth, but the limit is being approached. However any fixed partial denture replacing more than two teeth (except incisors) should be considered a high risk.

In our routine dental clinics more than often we come across patients with longer edentulous spans, fewer strategic abutments and more compromised oral status which is a far cry from the standard situation recommended by Dr. Ante to deliver fixed prosthesis. Does it mean that all such patients go for cumbersome removable prosthesis or the more expensive and extensive implant therapy? Are we as specialists supposed to stick to a calculated ratio stipulated some time in 1926 and deny treatment to patient or accept the challenge, explore beyond fixed norms and principles and apply innovative treatment approaches to make the best of the situation as for today? Again this law has its own limits.

Shortcomings of Ante's Law

- The suggested ratio cannot be made standard for all patients as individual variations in crown root ratio, root morphology and bone exist.
- Occlusal scheme which is the key factor has not been at all considered.
- Failure in FPDs are more due to biomechanical factors like caries, gingival inflammation, poor framework design, poor occlusion and material failure than due to overstressing of periodontal ligaments.
- Studies have revealed successful FPD's supported by periodontally weakened teeth.

With these considerations I decided to take some liberty in dealing with partially edentulous patients defying Ante's Law. To achieve predictable success in this technically exacting and demanding field few practical considerations should be taken care of in patient selection.

General Considerations In Patient Selection

- Age-As age increases the time period for which the FPD has to serve decreases. Again with aging usually the muscle power and the effective masticatory force decrease. Both factors favors long span FPDs.
- Systemic health- It effect the overall prognosis of the prosthesis as diseases like diabetes, hyperthyroidism, hyperparathyroidism, nutritional deficiencies directly affects the periodontium, bone and oral mucosa contraindicating complex fixed prosthesis. Again many diseases incapacitates the patients from performing his routine oral hygiene habits. But at the same time some diseases reduces the muscle power and masticatory load favoring long span FPDs.
- Parafunctional habits-Bruxism and clenching has detrimental forces (much higher than regular masticatory forces) on the abutment and supporting tissues thus contraindicating any fixed prosthesis.
- Previous dental history-History of successful dental treatments usually reflects favorable prognosis in future also.

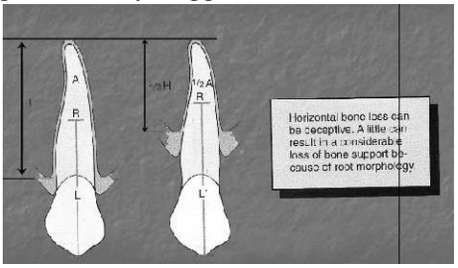
Local Considerations

Abutment

- The cervico-occlusal height of the crown should be good to offer better than average support and the tooth preparation should be extremely retentive to resist deflective forces.
- The tooth should be well aligned and not tilted to avoid any deflective forces.
- Abutments with multiple roots, divergent roots, elliptical roots are more favorable.
- Any periodontal disease present should be first treated. But presence of periodontal disease does not contraindicate fixed prosthesis.

Loss Due To PDL Disease May Be Deceptive.

Age-The same amount of loss in an old patient and a young patient has two different



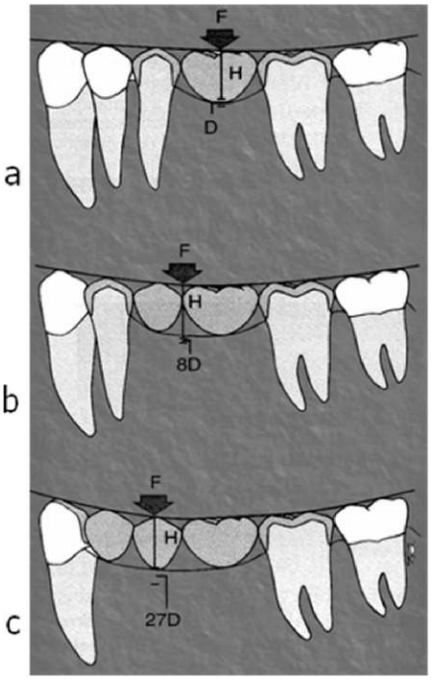
prognosis as the disease has been more virulent in the younger patient favoring FPD in the older patient.

Pattern of disease- Some diseases have more inflammation than actual bone loss which can be easily controlled by meticulous root planing and post-operative care.

Root morphology- Many roots have shapes and sizes which may still support fixed prosthesis even after considerable bone loss.

Span Length

- All FPDs flex when subjected to a load.



Deflection varies with the cube of span length. This means that for every unit increase in the span the deflection is increasing by three times. The greatest challenge here is to control this deflection.

Factors To Reduce Deflection:

- Choose a rigid material- Co-Cr is chosen instead of precious alloys and Ni-Cr due to its rigidity.
- Design the framework to be rigid- the pontics and the connectors are made bulky without over contouring them. Whenever possible all metal pontics are given instead of ceramic veneered pontics.
- Establish good occlusal scheme.

Occlusion

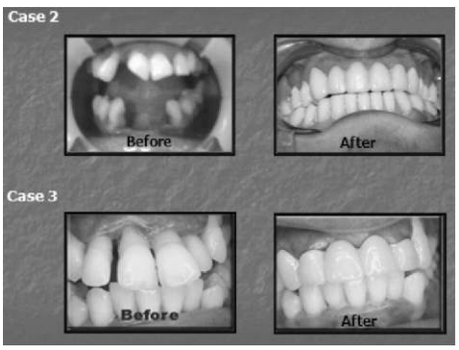
It is the key to success. Even the worst cases with doubtful prognosis had good success rates when occlusion was right. It should incorporate the following:

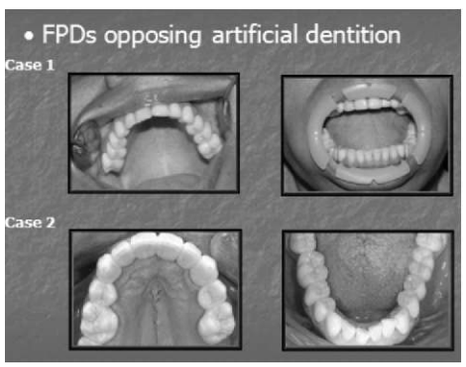
- Maximum intercuspation should coincide with centric relation at the physiologic vertical dimension. If it is not possible then freedom in movement from maximum intercuspation to CR without premature contacts should be provided.
- A mutually protected occlusal scheme is preferred. But if canine is missing or compromised then group function occlusion is established. If opposing arch consists of complete denture then bilaterally balanced occlusion is established.
- All interceptive occlusal contacts in eccentric movements are eliminated.
- Axial loading of abutments is preferred.
- Opposing artificial dentition favors FPDs. It has been found that if natural dentition exerts 150 pounds of force, FPD exerts 54 pounds of force and RPD exert only 25 pounds of force. Thus the latter favors long span FPDs
- An even occlusal plane is established. Usually with multiple missing teeth the antagonist teeth supraerupt and the adjacent teeth drift causing uneven occlusal plane and develops premature and deflective contacts. This should be first corrected.

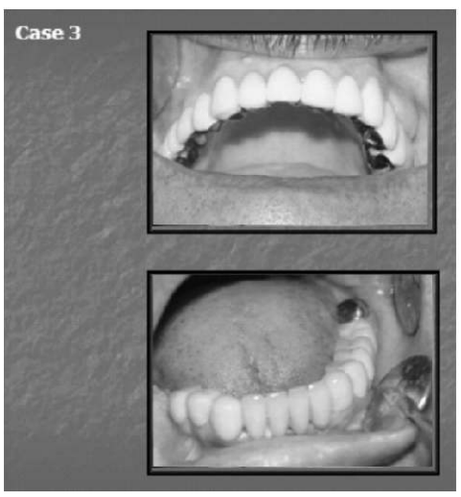
Treatment Plan

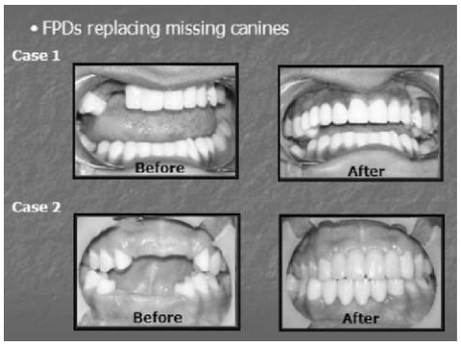
With the above considerations a comprehensive plan was prepared to:

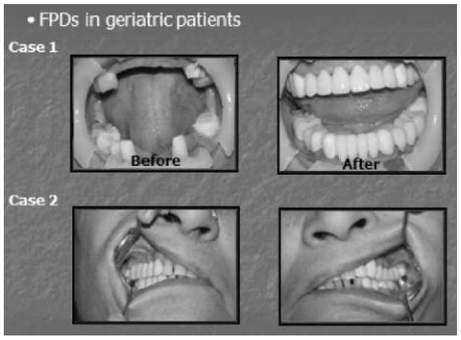
Case Presentation











- Treat Immediate Symptoms And Relieve Patient From Pain
- Stabilize Deteriorating Conditions Like Caries; Abscess etc. By A Multi-disciplinary Approach.
- Definitive Prosthetic Treatment
- Post Operative Care.

Post-operative Care

All the patients were recalled periodically to:

- Monitor oral hygiene habits
- Identify any incipient disease.
- Introduce any corrective treatment whenever required before any irreversible damage occurs.

Conclusion

All the patients showed amazing results with no failures through a five year study. This is not a signal to every dentist with a handpiece to start giving fixed prosthesis in one and all patients. Sold to uninformed and unmotivated patients without proper considerations it only buys a law suit. This study reveals that Ante's law is not the paramount factor to check the validity of fixed prosthesis in a given patient and if other factors (already discussed) are properly analyzed then success becomes predictable.

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