Occlusion & Prosthodontics

Occlusion and Prosthodontic Treatments

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Occlusion related issues and *contradictory debates*: A history of controversies for more than a century

Occlusion controversies affect dental practice. It starts with orthodontic in childhood and progresses to occlusal issues in restorative/prosthodontic treatments.
Most dentists are aware of the importance of the good marginal adaptation of their crowns and bridges.

Many dentists do not appreciate the potential consequences of poor occlusal contacts.
Occlusal components of a prosthesis:

- Type of *centric stops*
- Relationship of *CR and MIP (Maximum Intercuspation Position)*
- Type of *guidance*
- *Cusp* height and angle
- *Fossa* position and depth
- Direction of *ridges and grooves*
- *Lingual concavities* of prostheses (anterior maxilla)
- Dimensions of *occlusal table*

It was concluded that complications involving porcelain fracture, loss of retention and tooth fracture were indirectly associated with occlusal or parafunctional factors.
**Prosthodontics and Occlusion**

**Prosthetic dentistry** has the potential to: cause a change in the patient’s occlusion.

Where occlusal changes are inevitable due to prosthodontic treatments, it is required to achieve:

* A stable posterior occlusion along with smooth uninterrupted protrusive and lateral excursions

**Unplanned Occlusal Changes**

**Potentially**

**Restoration Failure**
Prosthetic dentistry has the potential to cause a change in the patient’s occlusion.
Developing occlusal features for a prosthesis

Conformative Approach Vs. Re-organized Approach

Objective:
To maintain the existing occlusion rather than re-organizing the healthy masticatory apparatus.
(As long as patient’s occlusion is symptom-free)
Developing occlusal features for a prosthesis

Conformative Approach  Vs.  Re-organized Approach

As a general rule:

Small Prostho. Cases  →  Conformative A.
Large Prostho. Cases  →  Re-organized A.
In practice, general rules are not always applicable.

**Conformative approach:** not always possible/appropriate for “small cases”

**Re-organized approach:** not always needed/appropriate for “large cases”
Conformative Approach

Providing restorations within the existing occlusal scheme

- Higher level of predictability
- Readily performed in smaller cases

Interocclusal Registration: Maintaining the existing occlusion
Conformative Approach

- In large cases, conformative approach may be possible using a staged procedure and alternative tooth preparation.

*Using temporary crown/bridges based on the pre-existing occlusion*

*Interocclusal record can be GC stabilized with Pattern/Duralay transfers*
Conformative Approach

- No need to restore the entire occlusion at once.
- Unprepared side provides the vertical stop.
- Developing occlusal guidance and stops through a staged plan

GC Pattern transfers with cusp cones & opposing fossa
Conformative Approach

Cross-mounting transfer:

1) Preserving the *original maxillo-mandibular relations*
2) Preserving *diagnostic occlusal design*
3) Transferring *VDO of provisional* to the final prostheses
Why is this approach favoured?

It is favoured not because it is the easiest; but, because *it is the safest*.

- Even if there is a slight discrepancy between MIP and CR, fabricating prostheses in a *stable MIP* is acceptable.

- This approach is potentially possible both for *simple* and *complex* prosthodontic cases.

- Unpredictable occlusal complications and the danger of *changing occlusion* can be avoided.
Can we improve the occlusion within the framework of conformative approach?

Pre-existing occlusion is not changed
(no change to the teeth not being restored); but,

occlusion of the teeth which are going to be restored can be changed in a way that it is fully harmonious with the pre-existing occlusion.
When is the Conformative Approach not appropriate?

Correcting an unfavourable or lost inter-occlusal relation:

1) An increase in vertical dimension is required.
2) Teeth are significantly over-erupted, tilted or rotated.
3) There is a history of occlusally related failure of existing restorations.
4) Full mouth rehabilitation is required to reconstruct a severely damaged dentition.
Correcting unfavourable inter-occlusal relation

Conformative Approach not possible
When conforming the pre-existing occlusion is not an option, two different scenarios can happen:

**Scenario 1**

*Planning a new occlusion before starting the work.*
*Visualizing the end result before the commence of Tx.*
When conforming the pre-existing occlusion is not an option, two different scenarios can happen:

**Scenario 2**

New occlusion: not well Planned/determined with too many unpredictable and accidental elements.
When conforming the pre-existing occlusion is not an option:

- Re-organized Approach
- Unorganized Approach
Objective of “Re-organized Approach”

Providing restorations with a new occlusion which is different from patient’s existing occlusion; but, it is well-tolerated by the patient.
Restorations which are not very well tolerated by the patient due to incorrectly organized occlusion can cause:

- Occlusal trauma to periodontium → bone loss/mobility
- Excessive opposing tooth surface loss
- Pulpal reaction and hypersensitivity
- Masticatory muscle tenderness and/or TMJ discomfort
- Fracture of the restorations and/or the teeth
Re-organized Approach

A re-organized occlusion will probably be better tolerated if the following features are achieved:

1) Evenly distributed occlusal contacts and forces
A re-organized occlusion will probably be better tolerated if the following features are achieved:

2) *Freedom in MIP* ("long centric" concept)

- Mandible can slightly move forward at the same Vertical D.
- CR is related to a biological area of TMJ, not a single point
- Occlusal contacts do not "lock in" mandible to maxilla.

Re-organized Approach

A re-organized occlusion will probably be better tolerated if the following features are achieved:

3) *No cuspal incline contacts*

MIP contact is on the cusp incline (no slide)

Slide from centric occlusion (CO) into Maximum Intercuspsion Position (MIP)
A re-organized occlusion will probably be better tolerated if the following features are achieved:

No cuspal incline contacts (*avoiding MIP-CR slide*)

*Slide from CR to Maximum Intercuspation Position (MIP)*

*Broad rubbing contact marks caused by a CR/MIP slide*
A re-organized occlusion will probably be better tolerated if the following features are achieved:

4) *Anterior guidance* in harmony with *envelope of function* and avoiding protrusive interferences.
Re-organized Approach

A re-organized occlusion will probably be better tolerated if the following features are achieved:

4) *Anterior guidance* in harmony with *envelope of function* and avoiding protrusive interferences.

*Lack of harmony* between restoration’s *anterior guidance* and *envelope of function*

1) Orthodontic forces (possibly diastema)
2) Attrition of the opposing teeth
3) Fracture of the faulty restoration
Re-organized Approach

A re-organized occlusion will probably be better tolerated if the following features are achieved:

4) Anterior guidance in harmony with envelope of function and avoiding protrusive interferences.
A re-organized occlusion will probably be better tolerated if the following features are achieved:

5) No occlusal interferences on the *non-working side*
A re-organized occlusion will probably be better tolerated if the following features are achieved:

- No occlusal interferences on the non-working side.
A re-organized occlusion will probably be better tolerated if the following features are achieved:

1) Post. teeth come into contact only at the very end of chewing strokes (to minimize horizontal loading on the teeth)
2) Post. teeth act as stops for vertical closure
3) Importance of canine-guidance

6) *Mutually protected occlusion* (disclusion of posterior teeth in mandible excursions)
Re-organized Approach

Re-organizing patient’s occlusion through Prosthodontic treatments:

Achieving an **Ideal/optimal** Occlusion?

A controversial issue!
Thank you