Symposium - The worn dentition - part 4

Host
The Danish Dental Association (Tandlægeforeningen)

Date
03.11.2023

Reservations
All reservations of the correct reproduction of the course material in the notes are taken by the author.

Top 3 Dental Insights

1. Rehabilitation of the worn dentition

In 2023 only 1/8 young senior patients (65-74 years old) are endentolous, while in 1997 is was 1/4. We will see more and more physiological tooth wear, because people are keeping their teeth longer throughout life.

Severe tooth wear inceases from 3% at age 20 years to 17% at age 70 years.

Most people come to the dentist because of esthetic problems.

Premolars with 2 cusps replaced have 297% more chance of failure than premolars with 1 cusp replaced.

Symptoms of why tooth wear patients seek treatment
59% esthetic concerns
49% sensitivity
17% functional problems
14% pain

It's important to monitor the patients closely. If they don't change their habits, and if the root cause is not treated, the problems will reappear after a few years.

You have to find the cause of tooth wear in each of the patients.

Chemical (fx gastro-oesophageal reflux)
Mechanical (fx occlusal dysfunction)
Combined chemical and mechanical (fx bulimia + bruxism)

2. Treatment of patients with tooth wear

Patients adapt quickly to moderate new occlusal vertical dimensions (OVD). The functional and prosthetic complications after the OVD increase are not frequent and usually no longer evident after 2 weeks.

By opening OVD you create a flatter guidance.
By closing OVD you create a steeper guidance.

Occlusal diagnoses (by Dr. John Kois, Functional Occlusion Manual):
1. Acceptable function — No treatment necessary (green zone)
2. Constricted envelope — Curable (yellow zone)
3. Occlusal dysfunction — Curable (yellow zone)
4. Parafunction — Can only be managed (red zone)
5. Neurologic disorders — Can only be managed (red zone)

8 conclusions in treatment of the worn dentition (by Dr. Stefano Gracis)
1. Always attempt to identify the cause(s) of tooth wear before starting any treament.
2. If the tooth sbstance loss is due to chemical action, besides helping the patient adress the issue (medically or behaviorally), consider protecting the remaining tooth surfaces.
3. Not in all patients tooth wear causes loss of OVD (occlusal vertical dimensions).
4. Diagnosing the loss of OVD is a secondary aspect to the need to alter it for restorative reasons.
5. Occlusal vertical dimension is a parameter that can be modified, but with moderation.
6. The clinical approach should be mediated by the application of provisional restorations to test the new vertical dimension and the evaluation of the patient's adaptive capacity through a thorough semeiological analysis.
7. When absent, obtaining an efficient anterior guide should be an aim of the prosthetic rehabilitative therapy.
8. Place these patients on a strict maintenance program with adequate intervals.

5 conclusions in treatment of the worn dentition (by Dr. Daniel Edelhoff)
1. Monolithic ceramic restoration need precise transfer of occlusion.
2. "Test drives" with polymers for fine adjustment of function/esthetics.
3. Material wear: composite —> hybrid ceramic —> glass ceramic —> zirconia.
4. Avoid overload of implants by suitable superstructure.
5. Material selection/combination tailored to individual clinical situation.

3. Removable or bonded polymer splint in rehabilitation

Direct techniques are great when:
- Minimally invasive techniques especially in young patients and high risk patients
- Low cost treatments as only option
- Dentist should be skilled

Indirect techniques are great when:
- In large rehabilitations better management of occlusion and vertical dimension
- When optimal form and esthetics is required associated with ceramic materials
- Higher costs

Wear indication removable splint

Removable tooth colored snap-on splint (Munich splint of PMMA) can indicate wear facets in the patient for 3-12 months.

Benefits of a removable splint:
- Increase patient acceptance
- Reestablish occlusal plane and tooth morphology
- Esthetic and phonetic evaluation
- Shorter period of adaption
- 23h function (1h for cleaning and eating), which gives a higher efficiency and thereby a “reset” option

Wear indication bonded splint
A bonded splint is also an option for up to 2-3 years, and then a final restoration can be made.

Benefits of a bonded splint:
- High patient acceptance
- Almost perfect tooth morphoogy and single tooth overload
- Option of esthetic and phonetic long-term evaluation
- Shorter period of adaptation, 1:1 situation of waxup
- 24h function, which is a permanent therapy and thereby is highly effective

That was Top 3 Dental Insights.

Get the rest of the notes below and as a PDF at the bottom of this mail.

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Reservations

Treatment concepts and strategies for the rehabilitation of the worn dentition

V/ Daniel Edelhoff, professor, dr med dent
Stefano Gracis, dr, dentalbrera.com

Stefano Gracis, dr

Books “Tooth Wear” - Didier Dietschi
Book: “Tooth Wear — The Quintessential Challenge”

Chemical (fx gastro-oesophageal reflux)
Mechanical (fx occlusal dysfunction)
Combined chemical and mechanical (fx bulimia + bruxism)

It’s important to monitor the patients closely. If they don’t change their habits, and if the root cause is not treated, the problems will reappear after a few years.

Questionnaries for the patient
Medical history form
Dental history form

Dental history form by Dr. John Kois

You have to find the cause of tooth wear in each of the patients.

Occlusal diagnosis by Dr. John Kois, Functional Occlusion Manual:
1. Acceptable function — No treatment necessary (green zone)
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4. Parafunction — Can only be managed (red zone)
5. Neurologic disorders — Can only be managed (red zone)

Diagnosing parafunction:
- Accurate clinical history
- Accurate semeiological examination (muscle palpation, clinical signs and symptoms, mandibular position and movement, joint condition, shape and extension of wear facets)
- Evaluation of bite appliances, if present (‘read’ the patient’s previous oral appliances)

Attrition / abrasion (mechanical): flat, shiny, well defined margins that match the antagonist teeth.
Erosion (chemical): cup shaped, surface not glossy, satin finish and rounded edges.

OVD = occlusal vertical dimensions

The vertical dimension:
- Normal dentate
- Compensatory alveolar eruption (OVD is maintained)
- No compensatory alveolar eruption (OVD is decreased)

How to determine occlusal vertical dimensions (OVD):
Good, but uncertain ways:
- Normal freeway space = 3 mm, but this can differ according to airway space etc.
- Observe the closest speaking space — “S” sound (patient counts from 60-69).
- Arbitrary visual inspection.

Patients adapt quickly to moderate new OVD.

There is no evidence in the literature that the OVD cannot be altered or that variations in OVD cause damage.

The functional and prosthetic complications after the OVD increase are not frequent and usually no longer evident after 2 weeks.

Wear of the dentition does not necessarily indicate a loss of OVD.

It might necessary to alter OVD, if you need more vertical space for the restorations, or if you want to modify and overjet over overbite.

Centric Relation (CR)

By opening OVD you create a flatter guidance.
By closing OVD you create a steeper guidance.

A flatter guidance:
- Decreased loading of anterior teeth
- More favorable muscle response
- More horizontal chewing (and, thus, potential for more attrition?)
- Less posterior disclusion
- Higher risk of posterior interferences
- Flatter posterior anatomy

A steeper guidance:
- More posterior disclusion
- Less risk of posterior intereferences
- Steeper posterior anatomy
- More vertical chewing (and, thus, potentiel for less attrition?)
- Unfavorable muscle response?
- Increased loading of anterior teeth

Patients with constricted envelope of function have many clinical signs and symptoms (from John Kois):
- Tender joints
- Tired muscles when speaking a lot
- Typical wear pattern: lingual maxillary teeth and buccal mandibular teeth
- Absence of significant wear on posterior teeth (depends on timing of problem)
- Mobility of anterior teeth
- No mobility of posterior teeth
- Open spaces among anterior teeth
- Fast chewing (fewer cycles)
- Anterior initial contact after deprogramming

Book by Dr. Calamita

Conclusions
1. Always attempt to identify the cause(s) of tooth wear before starting any treament.
2. If the tooth sbstance loss is due to chemical action, besides helping the patient adress the issue (medically or behaviorally), consider protecting the remaining tooth surfaces.
3. Not in all patients tooth wear causes loss of OVD (occlusal vertical dimensions).
4. Diagnosing the loss of OVD is a secondary aspect to the need to alter it for restorative reasons.
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6. The clinical approach should be mediated by the application of provisional restorations to test the new vertical dimension and the evaluation of the patient's adaptive capacity through a thorough semeiological analysis.

7. When absent, obtaining an efficient anterior guide should be an aim of the prosthetic rehabilitative therapy.
8. Place these patients on a strict maintenance program with adequate intervals.

Daniel Edelhoff, professor, dr med dent

DMS V Study:
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Severe tooth wear inceases from 3% at age 20 years to 17% at age 70 years.

Natural interincisal relationship: posterior teeth protect anterior teeth.

Most people come to the dentist because of esthetic problems.

Premolars with 2 cusps replaced have 297% more chance of failure than premolars with 1 cusp replaced.

Direct techniques are great when:
- Minimally invasive techniques especially in young patients and high risk patients
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Indirect techniques are great when:
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- Higher costs

Good combination treatment in the same patient:
LS2 monolithic ceramics
Sintered veneers
Direct composite

Gold alloy (type III gold) has better wear resistance and lower friction coefficient than lithium disilicate glass ceramic. Gold alloy will show the same wear rate as teeth.

Zirconia (monolithic ceramics) show no material loss. The occlusion has to be perfect, otherwise the antagonist teeth will be worn.

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Anterior teeth protect posterior teeth in dynamic occlusion.
Posterior teeth protect anterior teeth in static occlusion.

The glaze of ceramics will disappear in the contact areas after a few years, so we don't need glaze in the contact areas, just polish.

Composites will wear over time in bruxism patients, and therefore ceramics can be better in the posterior region.

Night splints should be used by restored bruxism patient the same way a car is parked in the garage for protection.

Complex cases treatment
Examination
Preliminary impression (CR/MI)
Photographs, Facebow
Analysis of esthetics and function
—>
Esthetic evaluation "mock up"

Positional splints (PMMA)
Tooth-colored splints (polycarbonate)
Bonded splints veneers (PMMA)
—> Functional evaluation "test-drive"

Selection of definitive material
Segmental tooth preparation
Bite transfer by separated splints
—> Transfer into definitive restoration

Conclusions
- Monolithic ceramic restoration need precise transfer of occlusion
- "Test drives" with polymers for fine adjustment of function/esthetics
- Material wear: composite —> hybrid ceramic —> glass ceramic —> zirconia
- Avoid overload of implants by suitable superstructure
- Material selection/combination tailored to individual clinical situation

That was Dental Insights. Thank you for being here. ❤️

Dental love, Anne Mette