Symposium - The worn dentition - part 3

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. How will the dental material fail?

Always think: "How will this material fail?" when using a material.

How will the material react to overload? Ceramics will crack, sometimes vertically. Composites will chip.

Find out if it's erosion and/or overload or dysfunction. Observe or treat? Reduce or add material?

You need to think about how you can bring the patient's teeth into their 80s and 90s (old age).

Treating teeth with severe wear:
First make new posterior support, then take care of palatal damage and seal the exposed dentin with composite.

If you prepare for crowns on worn teeth, you'll lose most of the remaining tooth substance.

Ceramic crowns need sufficient space. If there is not enough space, the antagonists will be destroyed.

If there are not enough molars, you MUST restore them. Otherwise, don't restore the dentition! The front teeth should not do all the work. The back teeth should protect the front teeth.

2. The patient's chewing function must be rehabilitated, not just reconstructed

Patients must be able to CHEW! They must be able to chew comfortably with both sides. Otherwise, the system will eventually fail. They shouldn't have to adapt to something that doesn't work.

Give patients gum and video record how they chew the gum. Use a gum to check occlusion and laterotrusion. This will give you the full picture of chewing function. The back teeth grind food in a circular motion, like a washing machine. If the "car" (lower molars) can't park in the "garage" (upper molars), there is interference. Cycling in and out.

A lot of people are just reconstructed and not really rehabilitated. If you just do a reconstruction, it will fail at the weakest link.

You have to choose the weakest link and not let the nature of the patient decide. You have to choose the restoration to be the weakest link.

Your restorations WILL fail at some point, but you have to decide WHERE. Think like a doctor: You can't always cure the patient's disease, but you can treat and reduce the symptoms.

The ultimate goal for the patient:
To chew comfortably on both sides.

3. Ceramic or composite?

To crown or not to crown? Ceramic or composite?

Biological approach:
Composites are similar to dentin.
Ceramics look like enamel.

It's a crime to prepare and remove a lot of healthy tooth substance to make full crowns!

Adhesive cementation has completely changed dentistry.

A new smile can truly be life-changing! The patient has to approve the treatment plan and the dental clinic can be a stressful environment. Therefore, it's good if the patient can use the temporaries at home so they have time to adjust to the new bite before the final restoration.

The success of the restoration depends on the quality of the adhesive cementation!

Perform TMJ deprogramming/relaxation in wear patients with a Michigan splint before additive treatment.

Crown types

Minimally invasive

- Additive veneers (manual fabrication) of feldspathic ceramics
- Classic veneers (manual fabrication, CAD/CAM) of lithium disilicate glass-ceramic veneers

Defect-oriented

- Onlays (CAD/CAM, manual fabrication) of lithium disilicate glass-ceramic monolithic/facially veneered
- Partial crowns (CAD/CAM, manual fabrication) of lithium disilicate glass-ceramic monolithic/facially veneered
- End crowns (CAD/CAM, manual fabrication) of lithium disilicate glass-ceramic monolithic/facially veneered

Conventional

- Crowns (CAD/CAM, manual fabrication) made of lithium disilicate glass-ceramic or zirconia monolithic/facially veneered or metal-ceramic

Never think "THIS is the final restoration!".

Make sure the underlying tooth substance is clean and healthy before you place a restoration on top of it.

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

Overview on ADDITIVE prosthodontics 3STEP Method

V/ Francesca Valiati, dentist, prosthodontics, MD

Erosion:
Restorations behave better than the original. The enamel and dentin melt away, but the restoration stay.

“Education: The path from cocky ignorance to miserable uncertainty.” — Mark Twain

Always think “How is this material going to fail?” when you use a material.
How will the material react to overlad? Ceramics will fracture, sometimes vertically. Composites will chip.

Determine if it’s erosion and/or overload or dysfunction. Wait or act? Reduce or add material?
You have to think how you can bring the patients teeth into their 80’s and 90’s (old age).

Francesca said in 2006: “We should stop doing crowns.” It was very controversial.
She compares teeth with legs, protheses and organs with chronic diseases.

Treatment of teeth with severe wear:
First create new posterior support, then take care of the palatal damage and seal the exposed dentin with composite. Double veneers with palatal composite and facial ceramics can be a biological success.

If you prep for crowns on worn teeth, you will lose most of the remaining tooth substance.

Ceramic crowns need enough space. If there's a lack of space, the antagonists will be destroyed.

3STEP Method anterior:
Increase vertical dimensions
Composite palatal veneers
Facial ceramic veneers

3STEP Method posterior:
No prep and no anesthesia
Ceramic onlay
Bonding with hybrid

3STEP Method:
No anesthesia
Direct composite build ups of anterior teeth
Tacos: V-shape CAD/CAM composite monolithic restoration

If there are not enough molars, you HAVE to restore them. Otherwise don't restore the dentition! The anterior teeth should not do all the work. The posterior teeth will protect the anterior teeth.

Give the patient chewing gum
Patients should be able to CHEW! They should chew comfortably with both sides. Otherwise the system will fail at some point. They should not adapt to something malfunctioning.

Give the patients chewing gum and record on video how they chew the chewing gum. Use a chewing gum to check occlusion and laterotrusion! Then you get the full picture of mastication! Posterior teeth grind the food in a round motion, like a washing machine. If the car (lower molars) can't park in the garage (upper molars), there is interference. Cycle in and out.

Reconstruction or rehabilitation?
Do you do real rehabilitation or do you do reconstruction? Real oral rehabilitation is "gnathology". Not all people are bruxists! Many people are just reconstructed, and not really rehabilitated. If you just do reconstruction, it will fail at the level of the weakest link.

Weak links: restoration failure, excessive tooth wear, root fracture, tooth mobility, loss of attachment, TMJ disorders, muscular dysfunction, vertebral dysfunction.

Many insufficient reconstructed patients with symptoms are just categorized as psychosomatic symptoms. Sometimes it takes just one tooth, to push the balance (equilibrium) towards the red zone. You have to remove the risk factors, otherwise the symptoms will stay. Vertical chewers are very aggressive to the gingiva.

Protect the tooth substance underneath the restoration. Prostheses should not overload the remaining surrounding tissue.

The mandible should be at the center.

You should decide the weakest link
Where will you like the failure location if there is overload? In the restoration, the crown, the root, the periodontal ligament, the implant? The restoration of course!

You should select the weak link, and not let the patient's nature decide. You should select the restoration to be the weakest link.

Non-invasive additive CAD/CAM monolithic composite restoration.

With eating disorders or gastric reflux, you can protect the teeth from stomach acid with a simple removable night guard (like a whitening tray) that works like an umbrella.

Additive non-invasive veneers:
Palatal veneer
Taco veneer (V-shape)
Step veneer

Fun fact: Monolithic disilicate will shine dark at night clubs with fluorescent light!

Dental material choices:
Ceramic
Direct composite
CAD/CAM composite

Patient's choice with anterior teeth:
Non-invasive
Esthetic
Function
Biology

GTEST:
1. Way of chewing
2. Pattern of chewing
3. Masticatory muscles
4. TMJ's
5. Conflicts (anterior and posterior)

Different chewers:
Horizontal chewer: plantbased, chewing round and round. Horizontal chewing is more desirable.
Vertical chewer: carnivores, chewing up and down.

Final goal for the patient:
Chewing on both sides comfortably.

Francesca's treatment takes 2 hours every time once every week for 5 weeks. "You sleep, I bond!" It's cheaper to do composites than ceramics. Composites are also more biologically compatible.

Are there patients that you don't want to see? Because you know there's always something wrong? Think longevity, and not dysfunctional wear and overload! Your restorations WILL fail at some point, but you should decide WHERE. Think like a doctor, you can't always cure the patient's disease, but you can treat and reduce their symptoms.

NOBRUX classification: define the conflicts.

Our therapeutic objective:
- NOT restorations survival, but protection of the remaining tissue!
- Chewing on both sides comfortably.
- Sleep great at night knowing that you do a great job rehabilitating your patients.

Francesca Vailati book: “3STEP Additive prosthodontics”, 2022

Franscesca tells her patients that she can’t be responsible for her patient’s diseases, but she can rehabilitate as best as possible. After that, patients do their own physiotherapy when they chew. Patients always pay for their treatmens. No guarantees.

Full-mouth adhesive rehabilitations of patients with tooth wear, and Innovations in prosthetic materials and latest techniques

V/ Irena Sailer, professor, dr med dent, and
Vincent Fehmer, MDT (dental technician)

To crown or not to crown.
Less invasive concepts.
Document your cases.

It’s a crime to prep and remove a lot of healthy tooth substance to make full crowns!
Veneers, overlays, partial crowns, occlusal veneers, table tops, additional veneers (etch pieces).

Adhesive cementation has changed dentistry completely.

Soft drinks and energy drinks are very popular, and are very acidic and have sugar in it. They increase tooth erosion in young people.

Irena rarely use classic stone casts in the clinical practice. Classic wax up in study models gives us no indication whether it’s right for the patient. A clinical try-in waxup with a diagnostic stent is much better. Discuss the waxup function and esthetics with the patient and technician.
Finalization with fx feldspatic ceramic veneers.

Francois Duret, a pioneer in digital dentistry and intraoral scanning, 1973, Aarhus Tandlægeskole

Digital tools in dentistry:
- Clinical diagnostics
- Radiographic
- 3D planning
- Surgical stent
- Implantation
- 3D regeneration
- Digital impression
- Digital casts
- Digital provisionals
- CAD abutments
- CAD reconstructions
- Computerized maintenance

A future of less invasiveness:
Patented “The Geneva Key” = a 3D printed monolithic key with a digital waxup using stamp occlusion with direct composite resin.

Evolution of technology with smiledesign and virtual teeth tracking. Patients want a smile that is both esthetic and functional. Augmented smiledesign of before and after images of the patient’s smile and face.

New article: *Marchand L et al, Latest advances in augmented-reality technology and its integration into the digital workflow, International Journal of Computerized Dentistry, 2023 (submitted)*.

You can do micro-veneers of feldspatic ceramic for the anterior area for high esthetic cases. Feldspatic ceramics are still the highest esthetic.

Highest esthetics:
Veneers (change shape and color) —>
Micro-veneers (change color) —>
Monolitchic composite (change shape and color in full mouth)

Composites will still wear a bit more over time than ceramics.

Minimally invasive prep: slight refining and rounding of fragile enamel.

All their patients gets a postoperative protective splint as a night guard.

Digital/optical impression.

A new smile can be truly life changing! The patient needs to verify the treatment plan, and the dental office can be a stressfull environment. It’s great if the patient can use the provisionals at home to have time to adjust.

The success of the restoration relies on the quality of the adhesive cementation!

Deprogramming/relaxation of TMJ of wear patients with a Michigan Splint before additive treatment.

Dahl’s Principle of letting the anterior teeth elongate natural is best to do in collaboration with the orthodontist.

Micro-abrasion in combination with bleaching is also a great option for internal discoloration of anterior teeth.

Biological approach:
Composites are similar to dentin.
Ceramics are similar to enamel.

Conclusions
Minimally invasive
- **Additional veneers** (manual fabrication) of feldspathic ceramics
- **Classic veneers** (manual fabrication, CAD/CAM) of lithium disilicate glass-ceramics veneered

Defect oriented
- **Overlays** (CAD/CAM, manual fabrication) of lithium disilicate glass-ceramics monolithic/facially veneered
- **Partial crowns** (CAD/CAM, manual fabrication) of lithium disilicate glass-ceramics monolithic/facially veneered

- **Endocrowns** (CAD/CAM, manual fabrication) of lithium disilicate glass-ceramics monolithic/ facially veneered

Conventional

- **Crowns** (CAD/CAM, manual fabrication) of lithium disilicate glass-ceramics or zirconia monolithic/facially veneered or metal ceramics

You can never think “THIS is the final restoration!”.

Make sure the fundamental tooth abutment is clean and healthy before making a restoration on top of it.

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

Dental love, Anne Mette