**Principles of Interdisciplinary Orthodontic Treatment: restorative and periodontal**

This lecture is advanced for the undergraduate level, so we'll be asked about the general principles and concepts.

There's interdisciplinary treatment between orthodontics and other specialties; the topics we'll go through in this lecture are orthodontic restorative treatment; missing teeth, badly destructed teeth and periodontal treatment.

**\*Missing teeth**

***-Open & close space:***

The main issue we deal with in orthodontics when it comes to missing teeth is whether we have to open or close the space.

2 names that you need to remember: ***kokich*** ***v.*** and ***zachirson*** ***b***. these are very important names in orthodontics. The paper given to us is written by them, and it talks about canine substitution -when the canine acts as a lateral incisor-.

Generally when we talk about missing teeth in the posterior segment, general dentists like to place implants or bridges cause it makes a lot of money and they probably wouldn’t place orthodontic appliance just to close a posterior space. Although Dr Hamdan has been asked to close a space for a badly destructed 7 by pulling the wisdoms forward. His patient was willing to wear braces instead of having a prosthetic tooth. But generally that’s not the case, rarely you'll find a patient who’s willing to wear braces for about a year and a half just to close a posterior space while they can have it closed by 2 or 3 visits with a bridge.

So generally when we have the option to close or open a space we’re mainly talking about cases where the patient has other orthodontic problems and needs treatment.

The most common tooth to be missing is the upper lateral incisor.

What is the most important factor that determines whether or not we should close or open a space for the missing lateral incisor? It is the space requirement.

The idea is that if you need to extract a tooth and you have another missing one, it’s very difficult to justify extracting the first premolar and opening a space for a prosthetic lateral incisor, or for example if you have a missing lateral and crowding or increased overjet at the same time, and your dentist suggested extracting the 4 and opening the space for the lateral, you as a dentist yourself will be reluctant to accept that.

If you’re going to do that, the aesthetics of the canine have to be terrible, and it can’t be made to look like a lateral incisor in any possible way.

And that’s not really the case; you can substitute the lateral incisor for the canine quite easily.

So when do we decide that we’ll open the space? Usually in situations where we have adequate space for the laterals or when space requirements are minimal.

When measuring the available space we don’t count this as an available space, it depends on the treatment plan whether I want to close or open a space for the lateral.
If we want to open the space we consider that we have 2 missing or impacted lateral incisors, 6 mm each, then decide if this space is enough or not. So when we’re opening the space we consider it as crowding; we calculate the available space and subtract 12 mm.
If we’re closing the space we consider it as spacing that can be used to treat the malocclusion.

Few years ago, orthodontists used to get away with opening a space without getting the roots parallel, as in using tipping forces to open the space. This was accepted since they were planning to place a bridge. But now with the use of implants we need to make sure that we torque the roots back and that they are parallel to provide a space for the implant, prosthodontists even like the roots to be away from the space.

When would you place an implant in the place of lateral incisor for a patient after orthodontic treatment? At what age? What type of growth makes the implant fail the most in the anterior aesthetic zone? Vertical growth.

When does vertical alveolar growth stop? It never stops.

Here’s a scenario; a patient who’s 50 or 60 years old and lost a lower molar, does the opposing upper molar stay in its position? No, it over-erupts and the bone goes down with it. Even with tooth wear there’s vertical growth.

Brademark found that placing an implant in the aesthetic zone in 25 years follow up cases, are really short compared to the rest of the dentition.
There’re a lot of cases that have shown this. So don’t place implants anteriorly until the patient reaches late 30’s or even 40’s

For Dr Hamdan the ideal treatment plan for such patients is etch-retained bridge until reaching late 20’s or 30’s then he’ll place an implant.

When you see a lot of spacing this is a case where we want to open/redistribute the space. Don’t think of space closure.

When a space is present and it’s not large it will be a good idea to close it

In a lot of cases you should tell the patient these two options:

-Space closure
-Space opening and placing a synthetic tooth.

One of the difficulties of space closure is that you have to move the buccal segment forward and it is difficult. Why? Due to high anchorage demands. For this kind of forward movement -in front of the palate- we used facemask in the past.

We can also move the teeth one at a time, the problem of fixed orthodontics is that each tooth is treated as a single unit, if we need anchorage we should connect teeth to each other and this is a bit difficult.

When we want to move the first molar forward we can place a spring between the 6 and 7 and the same is done to push the 7 (we place a spring between the 7 and the 8). But how can we pull the 8 anteriorly? Luckily they invented the TAD’s “Temporary Anchorage Devices” as mini screws to pull the molar forward.

Removable appliances are better for anchorage than fixed; cause there’s acrylic around the teeth making them as one unit along with the palate.

An important thing to consider in Ortho-Perio when you look at someone’s smile is the level of gingivae. Canine gingival outline is approximately as the outline of the central incisor. So when we put the canine beside the central, and the level of the gingiva is the same, it’s un-aesthetic. So what we need to do is to make sure that the gingiva of the canine is below the level of the gingiva of the central incisor. We do that is by extruding the tooth, if we extrude a tooth the gingivae comes down with it.

The trimming done is gradual, hence there’s no risk of pulp exposure, we trim 1 mm then wait a month then another 1 mm and so on.

The other thing you need to know other than how to make a canine look like a lateral incisor is how to make a premolar look like a canine. You need to rotate it and intrude it a bit to obtain a correct gingival outline, and since you’ll intrude it, it will need build up for the tip.

Zachirson’s results in canine substitutions are amazing. What he does is that he trims the canine mesially, distally, buccally and palatally. Trying to make the surface flat and the incisal edge smaller.

That’s the gold standard, that’s how we do it now.

-**Uprighting**:

Another thing we’ll encounter as a GP’s is when a patient comes with the first molar extracted long time ago, the 7 tipped to the space and we need to place an implant or bridge, the best thing to do is to get that tooth upright.
It’s not good to do endodontic treatment for the tooth and remove a lot of tooth structure, which will compromise the periodontal health of the tooth under the bridge, specially if the patient can’t clean very well or there’s a small overhang somewhere, we’ll end up taking that tooth out.

The idea is that we need to upright that tooth. It won’t take that long; it only takes about 3-4 months. We can upright a tooth fully even if it’s a molar, it doesn’t cost much and it’s not aesthetically annoying, we’ll just put braces from the canine or premolar to the second molar.

-**Intrusion:**

Used when we have over eruption of the opposing tooth. Usually it takes a couple of months.

Closing an old extraction site will take about 6 months.

Tipping movement is usually easier and faster than bodily.

**\*Badly destructed teeth**:

­­­-**Extrusion:**

Especially if the finish line is below the gingivae, we can extrude the tooth up to 3 mm and place a restoration.

Crown lengthening can be done when we have enough attached gingivae, but when we don’t, it’s better to extrude the tooth.

**\*Reduced bony levels:**

­-**Movement of teeth into extraction space:**

If there’s an old extraction site where the bone has nicked, one of the things that can be done orthodontically is that we move the tooth with fixed appliance to the area of defect, pulling bone and soft tissue with it, subsequently filling the defected bone. This helps us increase the bony level to facilitate the placement of an implant by prosthodontists. This doesn’t work in all cases and you can’t promise the patient it will work 100%, also the patient must have excellent oral hygiene.

**-“Orthodontic extraction” extrusion of periodontally involved anterior teeth**:

Especially for periodontally involved anterior teeth that need extraction, instead of extracting the tooth surgically, we keep extruding the tooth until it goes out. The whole purpose of that is that bone will follow the tooth.

**\*Reduced attachment:**

If we have reduced attachment of the gingivae, we can also change that by extruding teeth, hence decreasing the pockets. Part of the treatment will be trimming of the tooth to eliminate the premature contacts that will result.

**\*Exposure of buccally impacted canines:**

When you have buccally impacted canine, what’s the ideal way of exposing it if it’s not too high up? Apically repositioned flap.