Today’s lecture will be about, restorative and periodontal considerations in interdisciplinary orthodontics (ps. Reference for this lecture will be chapter 18) the doctor said we should focus on the knowledge in general ,rather than the techniques.

 adjunctive orthodontic treatment: is an orthodontically controlled tooth movement, the aim of which is to control and enhance other dental treatments, control diseases, enhance appearance, and restore function.

 Interdisciplinary theory in orthodontics is **an interactive action** in which we have different specialists siting together in one clinic with the ptn . patients do contribute by asking questions and in the overall decision and treatment planning .

-orthodontist, periodontists , surgeons, restorative dentists, all will contribute in the treatment plan as well, this is an interactive action.

- Multidisciplinary approach in **an additive approach**, for instance a patient has a poor oral hygiene ,abundant plaque , badly destructed teeth , and malocclusion,,, in a multidisciplinary approach , let’s say, the patient will need to go to the periodontist to do scaling , root planning , and polishing,then go back to a restorative dentist for cons- endo treatments ,so he/she can go then to the orthodontist to treat the malocclusion.

 As we can notice each dentist did his work separately that’s why it’s considered an additive approach .

It’s important to know what the patient wants, his/her expectations before going for any treatment .

Special cases of interdisciplinary orthodontics :

* Spacing in the arch due to: missing teeth , microdontia , extracted teeth due to trauma or caries ,pathological migration due to active perio disease.

In these casees we need other specialists to help us decide whether to close or open the space.

* Deep overbite ,,,, reduce the overbite in order to be able to restore the teeth.
* Forced eruption of broken out teeth :if the broken area is under the gingival level, we have to extrude it in order to have a proper access and isolation .

Adjunctive treatment:

* Retroclined incisers causes improper alignment of forces applied on the tooth , crown root ratio is improper (CEJ is exposed so the ratio is increased ,increasing the force applied on the tooth ) so we have to decrease the crown length by intrusion .The restorative goal in this case is to have good isolation and good results, conservative technique , proper restorations and optimum esthetics .
* The patient has a cross bite, we can’t provide veneers for him / her. So we have to correct the cross bite first then do the veneers, otherwise they would fracture.

Some factors to know:

* There is no such adjunctive orthodontic treatment for TMJ problems.
* children are so sensitive and have high risks of root resorbtion in addition to loss of vitality , if possible we have to avoid intrusive movements .
* In case of crowding more than 2 to 3 mm we should avoid relieving it by simple interproximal stripping . in case of stripping more than 2-3mm teeth will come closer, periodontal ligaments and alveolar bone will do as well,so we have to avoid this large amount of interproximal stripping.
* Extrusion is completely safe ,we can extrude up to 1 mm /week ( safe procedure )

What should we do if a patient attended our clinic needing an interdisciplinary treatment?

* Proper history, intraoral +extra oral examination , we need to do periapical X-rays for specific areas for example 1) rotated tooth 2) tilted tooth 3)traumatized tooth …… etc.
* Form a joint clinic: Comprehensive treatment in the same clinic, patient can ask questions contributing in the decision making and treatment planning .
* Cephalometric radiographs :indicated if planning to move the labial segment by proclining or retroclining the teeth in order to make sure we will have the best asthetic results for that patient.
* Study models : take a bite , trim it properly , mount it on an articulator, this gives better diagnosis specially for restorative work .

It is the position of the wire rather than the brackets that affects the mood of movement that is undertaken.

 In case of intrusion: we place the wire more apically .

While in case of extrusion: we place the wire more gingivally .

(Be careful with intrusion)

It’s almost impossible to do a pure absolute intrusive movement, it’s usually a combination of intrusion with a bit of rotation and tilting movements , for we can’t go exactly along the long axis of the tooth and cause a pure absolute intrusion.

Example : Laila has a periodontal problem due to aggressive tooth brushing , she has good oral hygiene with ***gingival recession*** , we have to be careful while treating her , its better to use ***lighter wires*** in this case.

 Further explanation: in the previous case, the center of rotation is more apically located, the moment in this patient is increased , for :

**(Moment =force \* force arm)**

So an increase in the force arm will cause an increase in the moment , in this case we have to decrease the force applied on these teeth to have a better and a more efficient pressure or force on the teeth .

We should never start a treatment while the patient is having an active disease .

After restorative treatment we shouldn’t provide the patient with a definitive restoration, since we might do some occlusal changes during the ortho treatment.

Expensive final restorations should be postponed till ortho treatment is completed; we don’t usually put TFs , for the treatment might extend for a long time which will compromise the treatment and outcomes.

If the tooth is endodontically treated and will undergo an ortho treatment later, it should be observed for up to 3 months, and as long as its free of symptoms we can then move to ortho treatment .

Active diseases should be settled, and the orthodontist should ask for a report from the patients periodontist in order to make sure that the patient is a regular attender to his/her perio sessions, for if perio problems were present and ortho treatment was undertaken detrimental effects will result.

Case :a patient came for replacing her bridge work, she had good oral hygiene,,,, so what we did was that, we went for some extrusions to improve the crown-root ratio, close the spaces that were open (spaces were due to history of perio problems, pathological migration of teeth).

Persistent bleeding is the most indicative factor of an active perio disease, a history of periodontal disease is never considered a contraindication for ortho treatments, as long as the patient presented with good and stable perio health at the time of treatment ,we can start our ortho treatment.

 ptns with risk factors of gingival recession, specially on the lower teeth :

1)Thin gingiva (thin biotype)

2) alveolar bone dehiscence

 3)tooth brushing trauma

4) plaque induced inflammation

5)labial orthodontic movement

* What is the indicative of such problem ( recession )?

1-Width of the attached gingiva

2-Thickness of the attached gingiva

If the patient had a problem in any of the previously mentioned points before we start the ortho treatment , surgical mandibular advancement,or genioplasty, we have to have a gingival graft.

* **When do we need to do gingival grafting?**

In order to avoid gingival recession in cases of:

1-Genioplasty

2-Ortho treatment

3-Surgical mandibular advancement

* Patients with moderate perio problems, It’s better to have a flap raised in order to do scaling, root planning and polishing, than doing it blindly ( blindly=without raising a flap).
* A proper report from the periodontist is required before starting any ortho treatment ,otherwise more risks than benefits will result.
* Fully bonded tubes rather than bands might be used since they’re easier to clean around the gingiva in periodontally involved patients.
* Self-ligating brackets or steel ligatures rather than elastic ligatures

(Elastic ligatures absorb saliva, accumulates plaque, so its difficult to maintain a proper oral hygiene)

* After starting the treatment the patient should see his/her periodontist every 2 to 4 months
* When the patient books an ortho appointment every 2 to 4 months, he/she should book a perio appointment at the same date, so the patient won’t forget his /her perio check-ups.
* If the patient had a severe perio problem,he/she should see his periodontist every 4 to 6 weeks , ortho treatment must be minimum, we have to reduce the forces applied on the teeth as much as possible, in order to reduce the risk of resorbtion and decrease the pressure and forces applied on the PDL.
* Example:Tooth elongation- recession , Tooth lost its support-escaped the over bite stop ,and these lower teeth were pushed by the tongue so they over erupted, treatment in these patients is more different than ptns with normal good periodontal support .
* Gingival graft and bone graft are done before ortho treatment in these patients in order to have a good amount of attached gingiva and proper tooth support .
* If I want to replace a missing lateral incisor, with a canine ,gingival levels will be higher than that on the lateral incisor,,,,,we have to extrude the canine a little bit, so that the gingival level will go down a little bit as well ,and trim the canine in order to look like the lateral incisor-sometimes a graft has to be made after we finish the ortho treatment or alignment of the teeth.
* We can’t extrude the teeth forever we have to keep a good amount of root in the bone .
* Crown root ratio should be taken into consideration, if poor ratio with gingival recession exist we should consider splinting or permanent positioning of that tooth in the arch .
* A partial fixed appliance can be used to access the area of fracture (3mm of extrusion).
* If the fracture site is very high up in the root (hopeless tooth )we don’t extrude it we just leave it there.
* Forced eruption( extrusion) : in case of pocketing if involving 1 to 2 walls and surgical correction is not possible, for it’s in the anterior area ,orthodontists might go for some extrusions to bring the cementoenamel junction further occlusally and attachments further occlusally as well ,so improvements in the perio health and esthetics will result.
* 1mm of extrusion is feasible clinically, we can do up to 2 mm, but we shouldn’t exceed that (visits are done every 1-1.5 months ).
* If we have crowding and veneers are to be placed, we have to align these teeth properly , to have a good access for restorative work.

1) simple partial fixed appliance is placed to align the teeth

2) expansion and proclination

3) inter proximal stripping

 4) extraction of the most crowded tooth

5)temporary anchorage device with mini screws

* Deep bites are good sometimes to maintain the correction of cross bites.
* In case of a deep bite, We need to put a bite plane to unlock the teeth,correct the cross bite then go back to the lock, so in this way we have **locked the teeth back in the correct bite .**
* Fixed appliances are better in correcting anterior cross bites than the removal appliances .
* Forced eruption is used to bring teeth with defects a little bit occlusally, enhance isolation for rubber dam placement, crown lengthening for restorative work, if the defect is too far apically ,we usually can’t extrude the tooth( extrusion depends on the site of the defect).
* If the fracture is at the level of the crest of the alveolus we need 3 mm of extrusion (1mm gingival sulcus + 2mm gingival attachment = 3mm ) to have a good access to that fracture or defect.
* If the fracture or defect is 2 mm below the crest we need 5 mm of extrusion .
* Fractured teeth need to be extruded or elongated to get good access in order to restore them properly, when we elongate them the gingiva moves downward and esthetics will be affected, gingivectomy or a buildup is done next in order to improve esthetics , since not only teeth are part of the smile ,but also an important part of the gingiva .
* Black triangle : loss of interproximal attachments or tissues , happens mainly with patients with pervious history of perio problems where spacing occurs as a result.

Treatments might involve

1. Ortho space closure
2. Interproximal stripping
3. Further approximation , as if we are squeezing the tissues and the tissues are coming further occlusally to fill the triangle . (The wider the teeth are the more successful this procedure is- bulbous teeth are better than small teeth )
* Correction of cross bites are not always necessary ,unless it’s affecting the restorative work, we can treat it locally and no need for a comprehensive treatment .
1. Moving the upper teeth buccally without moving the lower teeth ,this will reinforce the anchorage involving more than one tooth, binding the teeth together and moving them relative to the lower teeth.
2. We move both upper and lower teeth by the reciprocal procedure in which cross elastics binds palatally on the upper teeth and buccally on the lower teeth.
* Remember that when doing interproximal stripping or extractions the overjet and the overbite increases, this is favorable if the patient has a class 3 malocclusion.
* Mild crowding :interproximal stripping with gentle force for aligning the teeth.
* Retention: if we have a good periodontal support we can go for:
1. Vacuum formed retainer
2. Fibrectomy
3. Canine-Canine tip retainer ( and this goes on the lingual surface of the canine teeth ).
4. Bonded fixed retainer.
* We can do an intrusive movement for an over erupted tooth: one of the side effects of tooth lose in one arch is the over eruption of the tooth in the opposing arch especially if that was for a long period of time.
* Spacing due to loss of periodontal attachments and pathological migration which has settled due to excellent oral hygiene .
* In case of a diastema closure fixed retainer must be used, kesling setup is a must in this case , allowing the patients to participate in the decision making, space analysis is also essential .
* Mild spacing: accept or close orthodontically + permanent retainers .
* Moderate: combination of ortho and restorative work .
* Severe : Combination of surgical intervention + restorative work ( implants- crowns ).
* Generalized spacing : needs a fixed retainer.

**Case presentation**

* Patient attended the clinic complaining of spacing due to accidental loss of the central incisor ,this patient, luckily, had a wide large lateral incisor, so in this case we can easily reposition it ,and shape it properly to look like the missing central incisor .
* Diastema due to the low frenal attachment: treatment would be ortho closure of space then frenectomy.
* Buildup is done only if the patient has small teeth, before going to the treatment you have to ask the patient what he/ she doesn’t like about his/her teeth , is it the size of the teeth ?or the spacing present ? if the patient doesn’t like the size only, we can build them up, if the patient is okay with the size of the teeth and only concerned about the spacing present between then closure of the space would be enough.
* In the lower arch in case of congenitally missing incisors it’s better to keep the deciduous teeth, for if we extract them bone level will decrease in that area.
* In case of congenitally missing teeth there is a list of indications and contraindications regarding opening-closure of the space present .
* We usually add a pontic to preserve the space until the permanent restoration is ready to be placed, For implants we have to wait until growth is already completed.
* Example : a patient with impacted 7, caries and badly destructed 6 , if this 6 was extracted and the space was left the whole dentition will be tilted, the appropriate treatment in this case would be up righting the 7 allowing it to erupt properly , extracting the 6 ,maintaining its space ,preventing the tilting of the dentition and preserving the space in order to make a bridge or an implant in the near future .
* In case of Prosthetic replacement when the tooth is been lost for a long period of time, the patient might need bone or soft tissue graft before or during our treatment , these procedures are **usually done during** our ortho treatment, otherwise relapse would occur ,while waiting for the implant to heal and the prosthesis as well ,which would take months.
* How difficult is it to move teeth in a specific area- if we are moving teeth in cortical bone we need longer time , less force , otherwise resorbtion would occur .
* Example: a patient with a missing lateral incisor – Centerline discrepancy and a cross bite , we have to correct the centerline discrepancy open the space and correct the cross bite .
* The doctor mentioned an example of a patient who had a supplemental tooth in the lower arch, this patient had an extraction of his/her upper 4 long time ago,Auto-transplantation of the supplemental tooth was done in the upper arch to replace the extracted upper 4,,,,,, endo treatment was done for this auto-transplanted tooth – hopefully to avoid ankylosis , this tooth has been crowned afterward.

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