Ortho II ,lecture #2 Abdelaziz Al-Shawa

Class I malocclusion components / features are :

 1. crowding

2. spacing

3. displaced teeth

4. vertical discrepancies

5. transverse discrepancies

6. bimaxillary proclination

* **Crowding**

Crowding happens when the space available is less than the space required in the arch

AETIOLOGY:

Crowding cause can be *primary :* when there’s a discrepancy between the size of the teeth and the size of the arches (one of it’s early signs is the early loss of c)

Or *secondary :* as when there’s a space loss due to early loss of primary teeth ( as in early loss of E)

Or *tertiary :* as in late lower incisor crowding (multifactorial ; late mandibular growth , soft tissue factors .. etc) , some people relate this for wisdom teeth but recent studies have shown that they are not related.

-crowding also can be classified regarding the degree (severity) : mild , moderate , severe

\*how do we create space in orthodontics : extractions –if we need ½ unit or more- , distalization , expansion ,proclination of incisors , interproximal stripping , derotation of **posterior** teeth , or any combination of the above

-extraction decision has 10 or more factors ; specific tooth condition , absence of other teeth, midline ,skeletal pattern ..etc

TREATMENT:

-**spontaneous alignment** (after an *extraction only* treatment); the Dr showed a case that has mesially angulated canines and the teeth are still erupting and there’s a moderate to severe crowding , in this case the teeth can be aligned spontaneously after the extraction of 1st premolars ,and actually there was a noticeable improvement after extraction but we can’t guarantee a complete alignment or complete space closure. We use this method when there’s 1. an uncooperative child 2. Medical history with an impact on cooperation 3.social history issues ; the patient is living far away and can’t attend regularly

-this is called a compromised treatment which means that the treatment plan wasn’t ideal and some aspects of malocclusion still not corrected but they are better after than before (doesn’t mean that we are compromising the oral health)

**-Removable appliances with/ without extractions :**

Other example on compromised treatment is treating upper arch with a cross bite using a removable appliance and leaving the lower arch with mild crowding untreated

Before using any removable appliance we should examine teeth angulation and inclination because these appliances can do tipping movements only ,, so when there’s a crowding in the upper jaw and the canine was mesially angulated , we can use a removable appliance (after extraction of 1st premolar if the crowding was sever, or without extraction if the crowding was mild) so we get a normally angulated canine. but if the canine was distally angulated (the root is on the front of the crown), the URA will make the angulation worse So we must use a fixed appliance in such scenarios

-nowadays if the treatment of a case needs many more than one removable appliance to reach the final goal, we go for fixed appliances directly

* **Spacing**

AETIOLOGY:

-generalized or localized

-in a localized spacing usually there’s a local factor like : loss of teeth , missing teeth , some small teeth size(peg shaped lateral),frenum problems

-in generalized spacing : generalized microdontia, muscle imbalance (like bimaxillary proclination ) multiple missing or unerupted teeth

TREATMENT:

-it’s difficult to treat *generalized spacing* ; in the most of the cases we can’t close them orthodontically and either we accept them or build up the small teeth, in some cases when we do an ortho treatment we need a permanent retention because the spaces tend to open , in severe cases we do a combined orthodontic- restorative treatment and we make *Trial(Kesling’s) set up*  done by distribution of the teeth on the cast to investigate the validity of different options to reach a realistic treatment plan (the teeth are cut off the model and repositioned in the desired place )

-whenever the missing teeth are more , the role of the orthodontist is less and we need more prosthetic work

**Management of missing lateral incisors :**

It’s a common problem , reaches 2% of the population ,it’s more in females

Can occur bilaterally or unilaterally , and when it’s unilateral the other lateral incisor is usually peg shaped

When you notice that the patient is having a missing or a peg shaped lateral you need to look for the canine because the lateral incisors guides the eruption of the canine and if it was missing the canine may be ectopic or get impacted ,also we must screen the patients siblings for the same problem because it tends to run in families

-What are the treatment options for the missing lateral incisor :

1. accept it ; when the patient refuse treatment or when the canine gets the space of the lateral incisor and not causing an esthetic problem to the patient (the shape and size of the canine is acceptable)

2. when the canine gets the space of the lateral incisor and it’s causing an esthetic problem , we can reshape the canine to look like an incisor to improve esthetics

3. orthodontic treatment (in most of the cases) when there’s still a space ,two main options orthodontically: we either **a.**close the space by the canine and the premolar then reshaping them , OR **b.** maintain/open the space for a future implant or any other restorative option

 -how do we chose any of these treatment options , depends on many factors:

1. patient’s attitude and cooperation

2. skeletal relationship :

 a. A-P relationship

examples( generally speaking) :

Ex1: patient with class II malocclusion with increased overjet and missing lateral , we can use this space to reduce the overjet to correct the incisal relationship , instead of extraction of 4s , we use the lateral incisor space

Ex2: patient with class III malocclusion , we will open the space for an implant in the future ; it’s not wise to close it which will make the overjet worse

 b. Vertical relationship

Ex: patient with gummy smile , it’s usually better to close the space , because the implants may show behind the gingiva

3. canine and incisors shade

Whenever the canine is darker and bulkier usually it favors to open the space , because when we put it in the place of the lateral incisor it’s hard to match shade and shape of the lateral incisor ( it may improve by bleaching , but we are talking here generally)

4. space condition (spacing or crowding) :

The presence of crowding , favors orthodonticlly space closure , so we utilize the space to relief the crowding

 The presence of spacing , favors opening space for lateral incisor replacement

5. the inclination of adjacent teeth

6. occlusion :

-if the molar , premolar , incisal relationship was class I for all of them ,usually this favors to open the space and making the canine also in class I

-if the molar was full unit class II relationship , this favors closing the space (remember that when we treat class II malocclusion by extraction of upper premolars , the final molar relationship is class II)

-if the molar was ½ unit class II relationship , this favors opening the space (distalizing the buccal segment)

**Median diastema**

causes :

1. Normal developmental during ugly duckling stage , and the space closes as the canines erupt
2. Dento-alveolar disproportion , (small teeth compared to jaw size)
3. Supernumerary teeth (mesiodens)
4. Small / missing lateral incisors
5. Proclination of teeth
6. High Frenal attachment (in deciduous dentition the upper labial frenum runs between the central incisors and attaches to the incisive papilla and then it recedes with time so be aware to this and don’t rush and do a frenectomy). To make sure if the prominent frenum is the cause of the diastema or not ,a. we do blanching test ; when the frenum is placed under tension there’s blanching of the incisive papilla

b. radiographically , a radiolucent notch can be seen in the midline

1. Pathology (cysts)

We must know the cause of the diastema to plan the treatment by removing the cause , usually after the treatment of median diastema the space tend to open again so we need permanent bonded retainer especially if the cause is the frenum (when we do frenectomy we cut the trans-septal fibers)

\*don’t try to close the diastema before the eruption of canines unless it was a huge diastema more than 3 m , if it was less than 3 mm in most of the cases it’ll close spontaneously after the eruption of canines

\*we can close the diastema with a removable appliance if we need a tipping movement or fixed appliance if we need bodily movement

* **Crossbite**

Can be localized (to one tooth) or affect the whole segment (unilaterally or bilaterally)

It’s very important to look for the *displacement* in every case of crossbite

*Displacement: when the patient tries to close his mouth from the rest position to the position of maximum intercusoation he can’t so he has to shift his mandible to one side , in posterior crossbite he shifts the mandible right or left , in anterior crossbite the patient shifts the mandible more forward which is called pseudo calss III*

AETIOLOGY:

1. Local cause; one single tooth (crowding ,early loss of teeth )
2. Skeletal : **a.** A-P (positional cross bite) ; as seen in class II and class III patients… the

 wider part of any arch is posterior part so when the mandible is positioned more backward in relation to maxilla, the narrow anterior part of the mandible occlude with the wider posterior part of the maxilla so the maxilla and the mandible Didn’t occlude properly and this is called ***scissor bite***

 the other way around happens in class III when the wider part of the mandible occludes with a narrower segment of the upper arch and this is called ***cross bite***

***so the scissor bite is common in not-corrected class II and crossbite is common in not-corrected class III***

\*when a patient with class II is wearing the functional appliance , it will position the mandible more forward so this is a ***crossbite*** *(as in class III)*

 **b.** transverse ; skeletally narrow upper arch

1. Soft tissues , associated with digit sucking habit (low position of the tongue and negative intraoral pressure)

TREATMENT :

-removable appliances can be used to treat dental crossbite as we tilt the upper teeth buccally (the posterior teeth are palatally inclined so when use the appliance the will be normally inclined)

-if the cause is skeletal and the upper arch is narrow , the upper teeth will be already buccally inclined as a compensation for the arch narrowing so we can’t tilt them more buccally using removable appliances

Usually we treat the crossbite when there’s a displacement because it MAY lead to TMJ problems

The functional indication for the treatment of posterior crossbite is the presence of mandibular displacement

-how to treat crossbites using a removable appliance:

The appliance must have : Screw ,posterior bite plane , four points of retention (like adam’s clasps)

And the patient has to turn the screw twice a week and usually we do some over correction

-when we need a bodily movement we use *quadhelix* (fixed appliance with coils )

-when the problem is true skeletal we use Rapid maxillary expansion (fixed appliance with a screw) ; we usually use it in early teens before the fusion of the maxillary suture so we take an occlusal radiograph to be sure that the suture is not fused yet , the screw is turned twice ADAY for a period of 2 weeks because the aim is to open the suture (skeletal expansion) rather than moving the teeth.

\*every turn/activation of screw ( in URA and fixed) gives 0.25 mm expansion

* **Open bite**

AETIOLOGY:

1. Skeletal : posterior growth rotation (we measure the vertical facial proportions)

Intra oral features : symmetrical and may extend posteriorly from 6 to 6, extra oral features : long face

1. Soft tissue : adenoid problems
2. Habits : thumb sucking habits , usually asymmetrical unless the patient uses both thumbs and not extensive (localized to the anterior teeth) can cause a crossbite with displacement
3. Local causes : failure of eruption of teeth

TREATMENT:

Depends on 1. the cause and it’s severity 2.the age of the patient

 -**surgery** ; sever skeletal problems may need surgery

 - mild skeletal patient 🡪**camouflage** and if the patient is still growning 🡪 **growth modification**

- twin block (growth modification) ; Growing patient with A-P problem (class II with increased overjet) ,the twin block causes protrusion of the mandible and intrusion of the posterior teeth at the same time

- High pull headgear; can be used in camouflage or growth modification treatment

***“The only real mistake is the one from which we learn nothing”*** GOOD LUCK :D