5th year Ortho II ,lecture #2

Class I malocclusion components / features are :

1. crowding

2. spacing

3. displaced teeth

4. vertical discrepancies

5. transverse discrepancies

6. bimaxillaryproclination

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

AETIOLOGY:

*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)

-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**

- 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

**-Removable appliances with/ withoutextractions :**

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 bimaxillaryproclination ) multiple missing or unerupted teeth

TREATMENT:

-it’s difficult to treat *generalized spacing* ; in the most of the cases 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 shape

**-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

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

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 (to make sure ,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)

the treatment: removing the cause, usually after the treatment of median diastema the space tend to open again so we need permanent bonded retainer

**\*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**

* **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 .*

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 crossbiteas 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 )

\*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 problem
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 withA-P problem

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