Class II division 2 malocclusion: features and treatment.

References:

1. Textbook of orthodontics
2. Contemporary orthodontics (profit)
3. Laura Mitchell for revision

Definition of Class II div2:

Lower incisor edges occlude behind the cingulum plateau of the upper incisors and the upper incisors are retroclined.

Prevalence:

A study in 2001 In Jordan showed that the prevalence of class ii div 2 was **8.4%,** While:

- class I was 40.3%
- Class ii div1 26.3%
- Class iii 25%

Aetiology:

Identifying these elements will help with the treatment because if you treat the cause you'll probably treat the problem, but if you don't, and you only treat the symptoms you'll end up treating the patient for life

- Skeletal factors
- Soft tissue effects
- Dental factors

1. Skeletal factors:
   - **Anterio-posterior**: assessed looking at the patient from the side. In Class II div2 cases A-P usually shows moderate Class II skeletal pattern. If it was severe the skeletal pattern changes into class II div1.
   - **Vertical**: assessed from the front. Usually reduced facial proportions, the MMPA and the lower facial height is reduced however there are cases were it wasn't reduced.

The Dr showed a cephalometric showing class ii div 2 malocclusion, the values were: SNA: 80, SNB: 75 , ANB:5 & this is out of the norm so we knew we're looking at class ii. Normal ANB is 2-4.
Then we look at the lower facial height, the MMPA was 18.57 and it's also reduced. then we look at the dental relations.

- **Transverse**: assessed from the front. Usually no issues. The symmetry is not measured generally but look at certain points on the right and left side of the face (the pupils, the ala of the nose, the ears, corners of the mouth, etc.)

2. Soft tissues:
    - **Competence:** when lips meet at rest without conscious effort.
    - **Lip line**: It's how much of the inner surface of the lower lip covers the upper incisors. Should be one third of the incisors. High lip line is a **key feature** of Class II div2. To examine the lip line; lift the upper lip out of the way while the patient is relaxed and observe how much of the inner side of the lower lip covers the upper incisors.
    - **swallow pattern.**

3. Dental factors:
- **retroclined upper central incisors**; this is because of the high lip line.
- **Upper laterals are usually proclined and rotated;** Because the laterals are shorter than the centrals and the high lip doesn't get as high as the laterals so they ski the control of the lip.
- **Lower incisors**: the dentoalveolar compensation of the class II skeletal pattern will result in proclination of the lower incisors unless the lower lip was strong enough to retrocline them(strap-like lower lip).
- **Increased interincisal angle**
- **Increased overbite** (traumatic)
- **Increased overjet**: maximum horizontal distance of the labial surface of lower incisors to labial surface of the upper incisors. (always take the highest measurement, in class ii div2 usually we take the laterals since the centrals are retroclined.)
- **Class II canine**
- **Class II molars** (these two are a reflection of the class II skeletal pattern)
  if the skeletal pattern was mild-moderate the canine/molar would be half unit class II (minimal)

In the same LCR: the upper incisal inclination was 98 and the normal is 109 the lower was 96 and the normal is 90-93. Normal IIA is 135 and in the LCR it was 146. So it's increased.

Problem list (everything that isn't normal in the examination):
generally the problem list in class II div2 consists of the following:

1. Skeletal class II
2. Reduced vertical dimensions
3. High lip line
4. Rotated and crowded upper lateral incisors
5. Increased overjet
6. Increased overbite (traumatic)
7. Class II molars
8. Class II canines

Treatment objectives:

Problems	**Questions to ask**
Class II skeletal	Can we change the skeletal pattern? Yes. Surgically only.
Reduced vertical proportions	
High lip line	Can we change the soft tissue pattern? No.
Rotated upper lateral incisors	Can we change the position of the dentition? Yes.
Increased overjet	
Increased overbite	
Class II canines	
Class II molars	

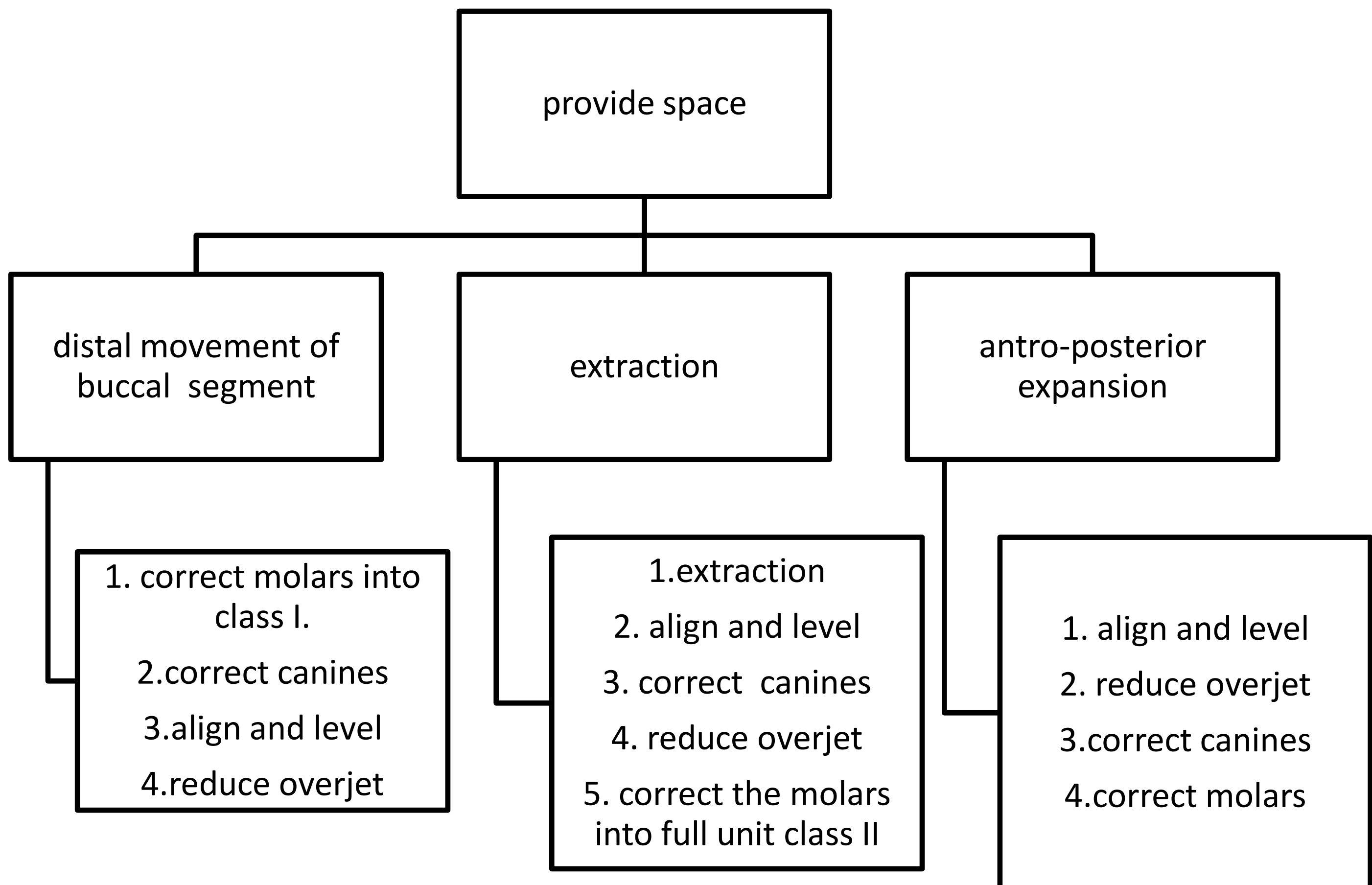
1. The logical sequence for correcting dental problems:
    1. Reduce the **overbite** first.
    2. Provide space. (how?)

When treatment planning keep 4 things in mind:

1. Extraction vs. non extraction
2. What type of appliance
3. Do you need anchorage or not?
4. The final molar relationship

The treatment planning and the treatment objectives are intercepting so the objectives depend on the plan. There are several ways to provide space in the treatment of class II div2 and the treatment plan will change accordingly:

1. Distal movement of the buccal segment.
2. Extraction.
3. Antro-posterior expansion.



Notes on the previous chart:

1. You can't reduce the overjet unless the canines are in Class I.
2. The dr. showed multiple clinical cases where the headgear commitment was a cornerstone to the success of the treatment.
3. The Cochrane evidence did a review on Class II div2 treatment with extraction and non-extraction methods and couldn't find any difference between the end result in stability and esthetics, etc.
4. Antro-posterior expansion is bringing the upper and lower incisors forward
5. if we procline the upper incisors by 1mm we get 2mm of space.

Overbite reduction:

1. extrude posterior teeth
2. intrusion of anterior teeth
3. procline lower incisors

When to procline lower incisors?

1. Habits (thumb sucking)
2. Deep bite (lower incisor trapped in the palate)
3. Adaptive tongue to lip swallow (usually in class II div 1)

Stability of overbite reduction is very important, it depends on 2 things:

1. Inter-incisal angle less than 150
2. Edge-centeroid relationship of 0-2 (edge of the lower incisors to the centeroid of the upper incisors)

Treatment modalities:

1. Accept it if the overbite is good and atraumatic.
2. Early treatment in the mixed dentition phase
3. Camouflage
4. Combined orthodontics orthognathic treatment

- **Early treatment:**
  - Functional appliance treatment:
    -change class II div2 into div1 by proclining upper incisors.
    -Treat class II div1 with functional appliance
    -All rules of functional appliances apply.

- **Camouflage:**
  - Fixed appliances treatment
    -The key thing of fixed appliances is correction of inclination of upper incisors require root movement (torque): we want to move the root of the upper incisors back and the crown forward and this is very difficult to achieve with fixed appliances.
    -Intrusion of upper incisors. To free them from the control of the lower lip.

-De-rotation of upper lateral incisors.
-A-P expansion.

- **Combined orthodontics orthognathic treatment:**
  - Surgery in certain cases:
    -severe vertical skeletal discrepancies; in class II div2 it's usually reduced vertical growth.
    -moderate AP discrepancies that cannot be treated with camouflage.
    -Facial aesthetics (patient's complaint)

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Good luck.