Clinical Dentistry Reviewed (2018) 2:19
https://doi.org/10.1007/s41894-018-0031-7

TREATMENT

Early treatment of class II malocclusion

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Received: 17 March 2018 / Accepted: 22 June 2018 / Published online: 17 July 2018

Abstract

Class II malocclusion is extremely common in mixed dentition. An increased overjet in the primary or mixed dentition is indicative of an underlying class II malocclusion. This can be due to a variety of factors, including digit sucking, a lip trap or an underlying skeletal II base relationship. A variety of treatment modalities can be used to effectively treat it.

Keywords Class II · Early correction · Increased overjet

Quick reference/description

Class II malocclusion is extremely common in mixed dentition. An increased overjet in the primary or mixed dentition is indicative of an underlying class II malocclusion.

This can be due to a variety of factors, including digit sucking, a lip trap or an underlying skeletal II base relationship. A variety of treatment modalities can be used to effectively treat it.

Overview

Following are the different treatment options for the treatment of class II malocclusion:

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Treatment	Indications	Mechanism	Disadvantages
I. Thumb deterrents	Persistent digit sucking habit during early permanent dentition	Discourage the habit	Demands patient compliance
II. Removable appliances	Increased overjet in the mixed dentition Spaced and proclined upper incisors	Dentoalveolar tipping	Cannot be used in skeletal II base relationship and mandibular retrognathia
III. Functional appliances	Increased overjet in the mixed dentition	Act by posturing the mandible forward	Retention of appliance in mouth May necessitate the use of a further appliance
IV. Headgear	Overjet in the mixed dentition	Distalize the maxillary molars	Retention problem Compliance
V. Fixed appliances	Increased overjet in the mixed dentition Spaced and proclined upper incisors	Retraction and uprighting of upper incisors	Bonding brackets and attaching wires to the primary teeth may increase their mobility and hasten their loss

Materials/instruments

Palatal arch with tongue cribs or spurs
Removable appliance (upper removable appliance with activated labial bow, e.g. Roberts retractor)
Functional appliance (e.g. Twin Block, Bionator)
Fixed appliance (2×4 appliance in mixed dentition)
Headgear to upper first molars with upper removable appliance [e.g. ACCO (acrylic cervical occipital) appliance]

Procedure

Early treatment should be initiated in case of class II malocclusions. The proposed advantages of early treatment are

- Maximize growth potential.
- Psychosocial benefits particularly in a child being bullied.
- Reduce risk of dentoalveolar trauma.
- Good compliance in younger patients.
- Reduce need or complexity of the second phase of treatment.
- Better overall outcomes.

Different treatment options include

I. Thumb deterrents

Long-term dental and skeletal changes can result from digit sucking habit if the habit is not discontinued before eruption of the permanent incisors. A passive device such as a palatal arch incorporating a thumb or tongue crib can be effective in discouraging the habit (Fig. 1).

II. Removable appliances

A removable appliance with an activated labial bow can be used to reduce an increased overjet in the mixed dentition if the upper incisors are proclined and spaced. This appliance retroclines the upper incisors by tipping of the teeth.

An anterior bite plane can be incorporated to help reduce an increased overbite. It should not be used in patients with a mark skeletal II base relationship, and mandibular retrognathia.

III. Functional appliances

Functional appliances are extremely effective in reducing an increased overjet in the mixed dentition (Fig. 2).

They work by posturing the mandible forward, changing the soft tissue environment and altering the forces that influence the position of the dentition.

Direct force is applied to the teeth via the appliance, from the forces generated by the stretch of the muscles controlling the mandible trying to return to its resting length.

This results in a distalizing force being transmitted to the upper jaw and the maxillary dentition and a mesializing force being transmitted to the mandible and the lower dentition.

These together are very effective at reducing increased overjets via

- Retroclination of the upper incisors.
- Proclination of the lower incisors.
- Distal tipping of the maxillary dentition.
- Mesial eruption of the mandibular dentition.
- Some small but worthwhile restriction in maxillary growth.
- Repositioning of mandible anteriorly with some remodelling of glenoid fossa.

The clinical effect of functional appliances is early establishment of a class I occlusion, relying on normal mandibular and condylar growth to maintain this.

While early treatment can effective, the adolescent growth spurt has been shown to be the most effective time to use these appliances.

Fig. 1 An anterior open bite and increased overjet as a result of thumb sucking. A palatal arch with spurs is used to break the habit, and there is an improvement in the incisal relationship

Fig. 2 A Class II/1 malocclusion treated in the mixed dentition with a functional appliance (Bionator)

IV. Headgear

Headgear can be used with a removable or functional appliance or alone for the treatment of class II malocclusion.

It can be effective in reducing the overjet in the mixed dentition. Classically, headgear can be run to maxillary molar bands while the patient wears an ACCO (acrylic cervical occipital) appliance to reduce the overbite and distalize the maxillary molars correcting the buccal segment relationship. The main problem with headgear is compliance, as it needs to be worn 12–14 h/day to be effective.

V. Fixed appliances

If space is available in the dental arch, a fixed appliance can be used to reduce an increased overjet.

The main problem with the use of fixed appliances in the mixed dentition is the lack of secondary teeth to bond to. A common approach is to bond the upper first molars and incisors, the so-called 2×4 appliance. Bonding brackets and attaching wires to the primary teeth may increase their mobility and thus hasten their loss, making the appliance uncomfortable and difficult to keep clean.

Pitfalls and complications

- Following are the contraindications of starting early treatment:
  - Extended treatment time.
  - Retention is problematic during transition of dentition.
  - Physiological cost of prolonged treatment.
  - Use up patient cooperation.
  - Cost to patient and parent—both economic and time.
- Poor oral hygiene.
- Repeated breakages.
- Failure to wear appliances as instructed.
- Problem with the use of removable functional appliances in the mixed dentition is retention of the appliance in the mouth.
- Primary teeth are generally not ideal teeth to attach a crib to, due to their conical shape and lack of natural undercuts. These teeth can also become mobile as they begin to exfoliate.

Further reading

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