

# KMCT DENTAL COLLEGE

MANASSERY P.O MUKKAM



## DEPARTMENT OF ORTHODONTICS

### SEMINAR

Topic: FACE MASK & CHIN CUPS

SUBMITTED BY  
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Final year part 1

## CERTIFICATE

This is to certify that Ms. SEETHA SADANANDAN, Reg. NO: 210021269  
of final year BDS part I has satisfactorily completed her seminar in  
ORTHODONTICS as prescribed by the University for the BDS course,  
during the year 2025-2026.

Date

Lecturer in charge.

Head of the department

Internal examiner.

External examiner

## FACE MASK & CHIN CUPS

### INTRODUCTION:

- **Definition:** Appliances used to modify skeletal growth and/or redirect dental eruption.
- **Purpose:** To correct malocclusions by influencing bone development.
- **Key Appliances to be Discussed:** Chin Cups and Reverse Pull Headgears (Face Masks).

## FACE MASK

### INTRODUCTION :

- It is also called reverse pull head gear .
- **General Purpose:** Reinforcement of anchorage or for maxillary distalization.
- **Specific Use:** Protraction headgear is used when an anterior protrusive force is required.
- **Therapeutic Procedure:** Treatment of prognathic syndromes, maxillary retrusions, clefts, and mandibular prognathism.
- **Historical Context:** Hickham (1972) first used a reverse headgear. Delaire popularized it.

### INDICATION:

- **Growing Patients:** With prognathic mandible and retusive maxilla. Aids in pulling maxillary structures forward and pushing mandibular structures backward.
- **Condylar Neck Bending:** For stimulating temporo-mandibular joint adaptations to posterior displacement of the chin.
- **Cleft Patients:** Selective rearrangement of palatal shelves.
- **Post-Surgical Relapse:** Can be used in correction after osteotomies (or uncontrolled growth).
- **Accessory Problems:** Can be used to treat certain accessory problems associated with nose morphology (e.g., lateral deviations) post-surgical adaptations.

## SITES OF ANCHORAGE

- **General Principle of Anchorage:** Obtaining stability to apply desired forces for tooth movement or skeletal change.
- **Maxillary Retraction:** Anchorage can be obtained from forehead, chin, or both.
- **Anchorage from Chin:**
  - Used in protraction headgears (e.g., chin cup with posts).
  - Force transmitted to the condylar cartilage.
  - **Disadvantage:** Potential for altering mandibular growth.
- **Anchorage from Skull/Forehead:**
  - Common for reverse pull headgears.
  - **Disadvantages:** Patient discomfort, cost, fabrication/fixing time.
- **Anchorage from Chin & Forehead :** Utilized by face masks.

## **COMPONENTS :**

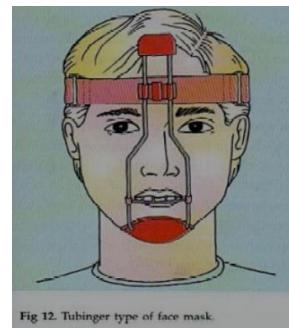
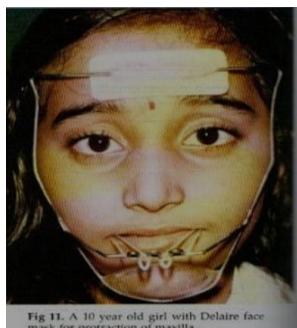
- **Chin Cup:** Takes anchorage from the chin area, connected to the rest of the facemask by metal rods.
- **Forehead Cap:** Derives anchorage from the forehead.
- **Metal Frame:** Main component, connects chin cup and forehead cap, provides attachment for elastics. Design varies based on face mask type.
- **Elastics:** Apply forward traction to the upper arch. Vertical posts on the chin cup attach elastics to molar region.
- **Intraoral Appliance (for Face Mask)**
  - **Most Common Type:** Multibanded or bonded appliance with rigid wire.
  - **Traction Hooks:** Placed in molar or premolar region.
  - **Associated Appliances:** Bonded R.M.E (Rapid Maxillary Expander) or bonded maxillary splint.
  - **Purpose:** To receive protractory forces from the face mask and transmit them to the maxilla.
  - **Activation:** Appliance should be activated for 8-10 days prior to fitting the face mask to disrupt the maxillary suture system.

## **TYPES OF REVERSE PULL HEAD GEAR :**

- **Protraction Headgear by Hickham:**
  - Developed in early 60s.
  - Uses chin and top of head for anchorage.
  - **Force Distribution:** 15% head, 85% chin.
  - **Components:** Two short arms for engaging maxillary protraction elastics, chin cup with two long arms running parallel to mandible.
  - **Advantages:** Better aesthetics, comfort, unilateral force applicability.
  - **Modification:** Rubber cushion under one arm for force alteration.

- **Face Mask of Delaire:**

- Popularized by Delaire in the 60s.
- Uses chin and forehead for support.
- **Appliance:** Rigid wire framework, squarish, kept away from the face.
- **Features:** Forehead cap, chin cup, wire running in front of the mouth for elastic attachment.



## TREATMENT

- **Skeletal and Dental Changes to Maxilla and Mandible:**

1. **Maxilla Movement:** Downward and forward with slight upward and downward movement in posterior palatal plane due to protraction force.
2. **Posterior Teeth:** Extrusion.
3. **Mandible Rotation:** Downward and backward rotation, improving maxillomandibular skeletal relationship and increasing lower facial height.
4. **Upper Incisors:** Labial inclination (reduction in lower incisor inclination).
5. **Soft Tissue Impact:** Significant on soft tissue overlying both upper and lower incisors, improving lip competence and posture.
6. **Class III Relation:** Significant reduction in severity.
7. **Upper Airway Dimension:** Can be altered; maxillary growth has a positive effect.

## BIOMECHANICAL CONSIDERATIONS

### **Amount of Force:**

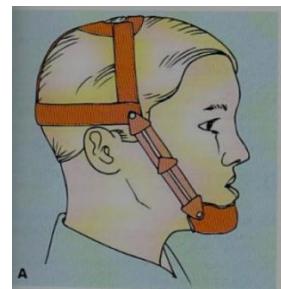
- **Required to bring about skeletal changes:** ~1 pound (450 gms) per side.
- High force values (1600-3000 gms) reduce treatment time (4-21 days).
- Low forces (250 gms/side) can take up to 13 months for desired results.
- **Direction of Force:** Most authors recommend 15-30° downward pull to the occlusal plane.
- **Line of force:** Parallel to occlusal plane for forward translation, as well as upward rotation.
- **Frequency of Use:** Most authors recommend 12-14 hours of wear per day.

## **CHIN CUPS**

- **Definition:** An orthopaedic appliance connected to a headgear, used to restrict forward and downward growth of the mandible
- It is used as a retention plan for face mask .
- **Components:**
  - Chin cup (covers the chin)
  - Adjustable elastic strap (connects chin cup to head cap)
  - Head cap (head-gear assembly)
- **Primary Use:** Preferred appliance for treating Class III malocclusion with mandibular prognathism (to suppress and/or redirect mandibular growth).

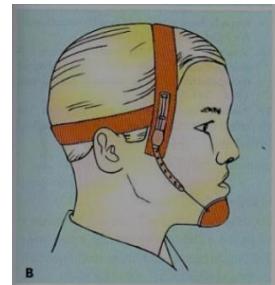
## **TYPES OF CHIN CUPS**

- **Occipital Pull Chin Cup:**
  - Derives anchorage from the occipital region of the head.
  - Most commonly used for Class III malocclusions with mild to moderate mandibular prognathism.
  - Successful in patients who can bring their incisors close to an edge-to-edge position at centric relation.
  - Can produce lingual tipping of lower incisors (protrusive lower incisors may be affected).
  - Most effective in children between 4 and 9 years of age.
  - Can be worn during retention following face mask treatment.



- **Vertical Pull Chin Cup:**

- Derives anchorage from the parietal region of the head.
- Indicated in patients with steep mandibular plane angle, excessive anterior facial height, and anterior open bite.
- Can accompany Class III malocclusion or certain types of Class I malocclusion.



- **Fabrication of the Chin Cup:**

- Chin cups are either fabricated individually for the patient or prefabricated commercially available.
- **Fabrication Process:**
  - Requires an impression to be taken of the chin area.
  - A cast is poured.
  - The chin cup is fabricated using self-cure acrylic resins.

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### **FORCE MAGNITUDE AND DURATION OF WEAR**

- **Initial Force:** 150-300 grams per side at appliance delivery.
- **Gradual Increase:** Over the next two months, the force is gradually increased to 450-700 grams per side.
- **Duration of Wear:** Patient asked to wear the appliance for 12-14 hours a day to achieve the desired results.

## **REFERENCES**

- Test book of ORTHODONTICS – Sridhar Premkumar
- Orthodontics The Art and Science – S.I Bhalajhi
- Google

## **Lecture incharge**

Dr. FAWAS WARIK