

DISTRACTION OSTEOGENESIS AS A TREATMENT MODALITY OF MANDIBULAR DEFICIENCY IN TREATED TMJ ANKYLOSIS PATIENTS

Presented by:

DR. HIMANSHU PRATAP SINGH

Sr. Lecturer

Deptt. of Oral & Maxillofacial Surgery

Institute of Dental Sciences, Bareilly

Introduction

- The concept of distraction osteogenesis was first described by **CODIVILLA** in 1905 and the biologic principle for generating hard and soft tissue was further developed as "**A LAW OF TENSION STRESS EFFECT**" BY **ILLIZAROV**. Since **MC CARTHY** et al first reported their success in lengthening the human mandible, various devices and techniques for Distraction Osteogenesis have been reported in the field of Oral And Maxillofacial Surgery.
- **DISTRACTION OSTEOGENESIS** is the process of generating new bone in a gap between two bone segments in response to the application of graduated tensile stress across bone gap.
- **DISTRACTION HISTIOGENESIS** is adaptive changes of the surrounding soft tissue (blood vessels, nerves, muscles, skin, mucosa, ligaments, cartilage, and periosteum) through the tension that is generated by distraction forces applied on bone.

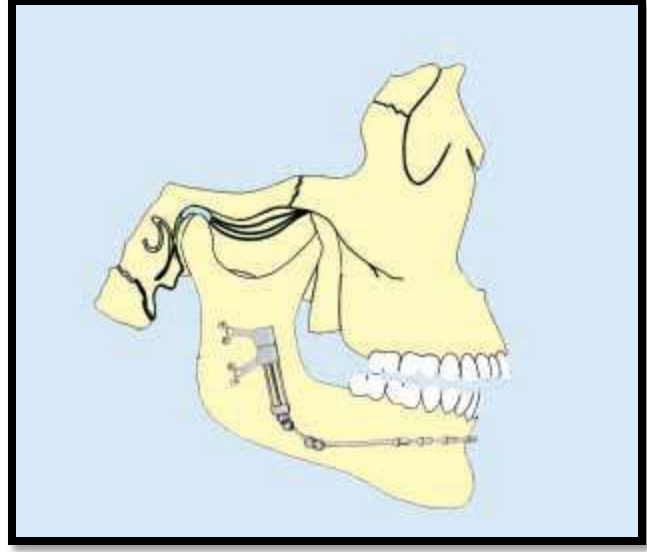
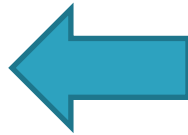
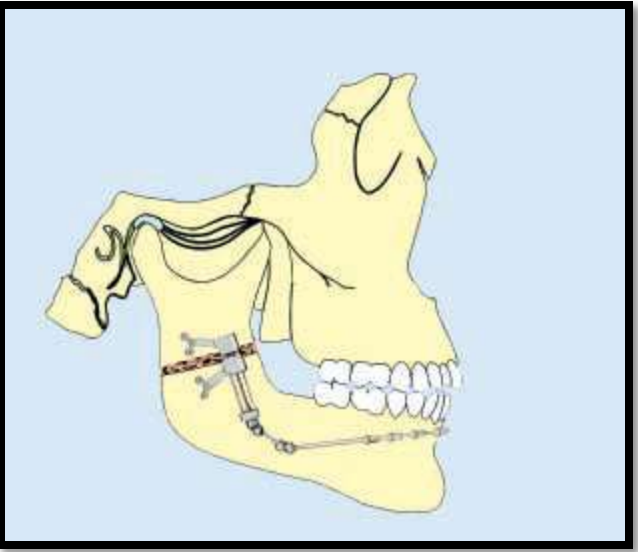
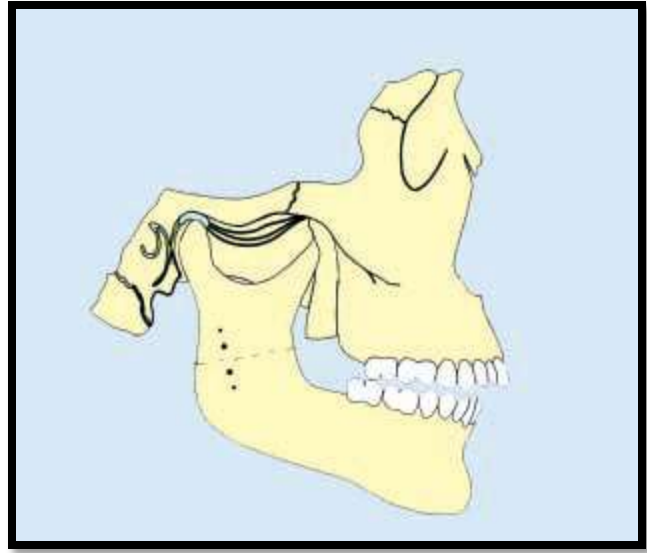
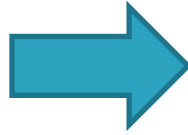
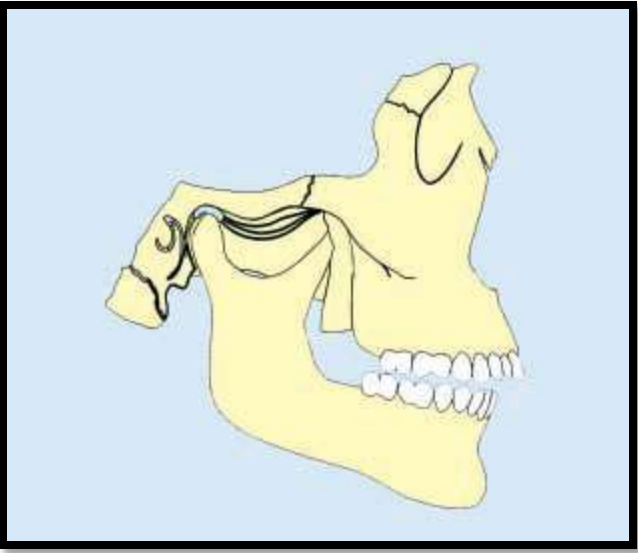
AIMS & OBJECTIVES

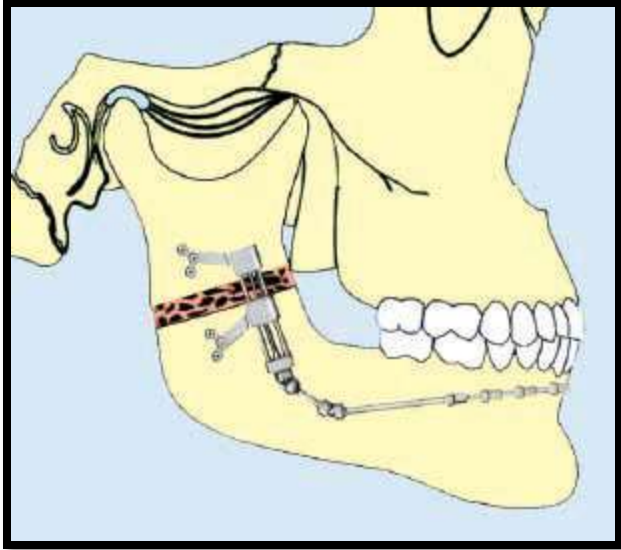


- To Evaluate The Use Of Intra-oral Distraction Devices For The Treatment Of Mandibular Hypoplasia In Tmj Ankylosis Patients.
- To Evaluate The Facial Symmetry Clinically.

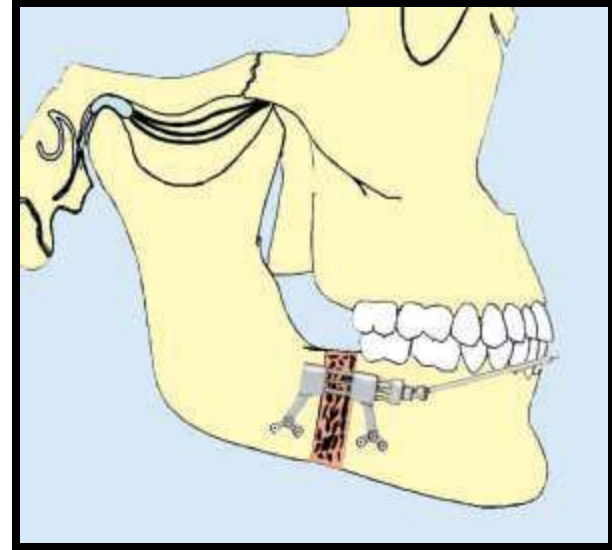
Timetable Of Distraction

- Osteotomy
- Latency period (3-7 days)
- Distraction (~ 1 mm per day)
- Consolidation (mineralization) period (3-6 weeks)
- Removal of the distractor
- Subsequent treatment, remodelling (prosthetic treatment)





Horizontal Distractor



Vertical Distractor

Process Of New Bone Formation Under Stress



- Interruption of normal fracture healing.
- Microenvironment is created by the application of stress, this causes changes at cellular & subcellular levels.
- These changes are referred as
 - Growth stimulating effect
 - Shape forming effect



TREATMENT PLANNING



1) Distraction Device selection

- **External devices**
 - Excellent control over bone movement
 - Available in longer lengths
 - Much easier to place & replace during distraction
 - Skin scarring
 - Poor patient acceptance

- **Internal devices**
 - No facial scarring
 - Better patient compliance
 - Difficult to place
 - Second surgical procedure is necessary to remove.
 - Higher risk of injury to nerve & other anatomic structures

2) Distraction device orientation

- Device should always be placed parallel to the direction of distraction.
- Should be placed either vertically, horizontally or obliquely.

3) Direction of distraction

$$\text{Pin placement angle} = 180 - \text{gonial angle} \times \frac{\text{Ramus deficiency}}{\text{Total deficiency}}$$

4) Distraction Protocol

- Latency Period- 3 to 5 days for childrens, 1 week for adults.
- Activation- 1mm daily @ 0.5mm twice or 0.25mm four times daily.



CASE DISCUSSION



Frontal view



Lateral view



Intra Operative



Pre Op OPG



During Distraction



Post Op OPG



SUMMARY & CONCLUSION



- Five patients of facial asymmetry was treated by intraoral unidirectional distractor device, showed favorable results in terms of function and aesthetics during the follow up period of 1 year.
- The intraoral device is our choice for distraction of the hypoplastic mandible in deficiencies up to 25 mm. Despite the enormous advantages of internal devices, there is 1 disadvantage: the need for another operation to remove the device.
- It may be concluded that young patients with mandibular hypoplasia can be treated effectively by means of distraction osteogenesis to lengthen the mandible.

FINISH

