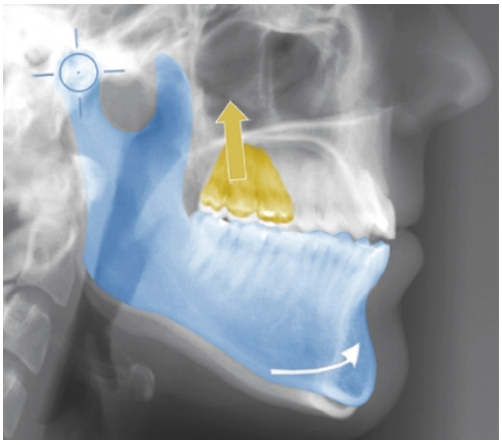
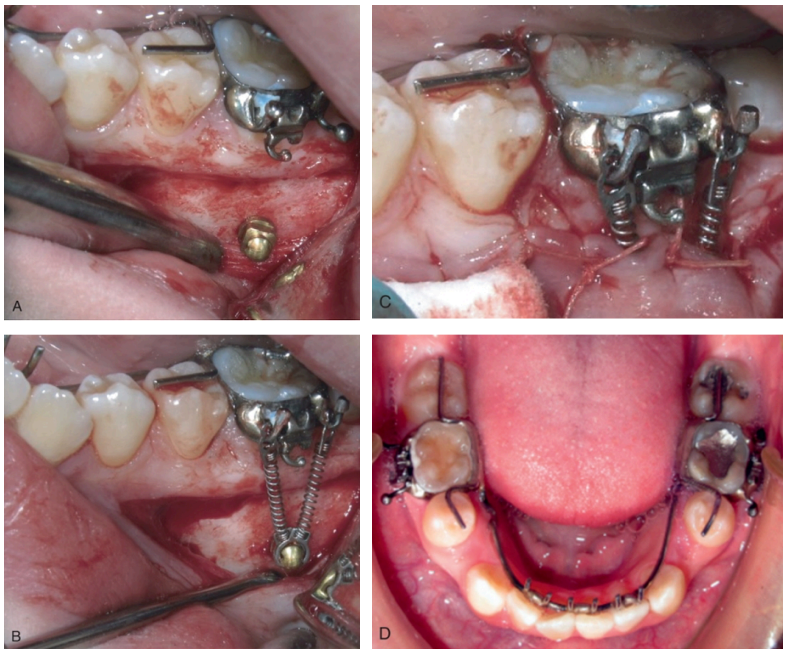
- The mandible rotates upward-forward during intrusion of the mx posterior teeth:
  - By adjusting the point of attachment of the spring to the plate, a cl.II or cl.III component can be added to the force.
  - May use cl.II or III elastics for compensation.
  - Eruption of the lower molars must be controlled, if a reduction of the anterior face height is the goal. Avoid relapse of the anterior open bite.



- Maximum force = **≤ 200 mg to a posterior segment of 3 teeth**.
- Intrusion = Slower than other tooth movements. Maximum **0.5 mm / m.**
- **0.5 mm posterior intrusion = 1 mm closure of anterior open bite.**
- **Maximum intrusion: ~ 4 mm. 15-20% lost in short term.**
- Eruption of the incisors can compensate for relapse of the mx molar intrusion, unexpected late downward growth of the mx or elongation of mn molars.
- No studies about long term stability are available at the moment.

- *Scheffler, 2014*: <u>Intrusion of mx posterior teeth with skeletal anchorage</u>
  - Mx molar intrusion can give satisfactory correction of moderately severe open bites: up to 6 mm in the long term from intrusion, more with extrusion of incisors.
  - Lower molar eruption must be controlled to gain a skeletal change with mx molar intrusion.
  - Clinical experience suggests that intrusion of both mx and mn posterior teeth can allow closure of more severe open bites.
  - Eruption of mx and/or mn incisors partially compensates for re-rotation of the mn, so bite opening after open bite correction rarely occurs.
  - Le Fort 1 surgery to superiorly reposition the mx is more likely to produce a significant shortening of anterior face height.

7. Intrusion of mandibular posterior teeth	- Bone screw between the molar and premolar roots. - NiTi coil springs for intrusion. - Wires to transfer force to the 2nd molars and 2nd premolars soldered to bands 6-6 - Adjustable lingual arch.

	- Spurts attached to the lingual arch to create tongue repositioning away from the open bite. 
Finishing and retention	- Positioners: • Rarely indicated for adult patients. • Never use in patients with severe periodontal bone loss. - <u>Mobile teeth with severe bone loss:</u> Splinting. - <u>Molar intrusion:</u> Use retainers with posterior bite blocks.

Proffit Chapter 20:

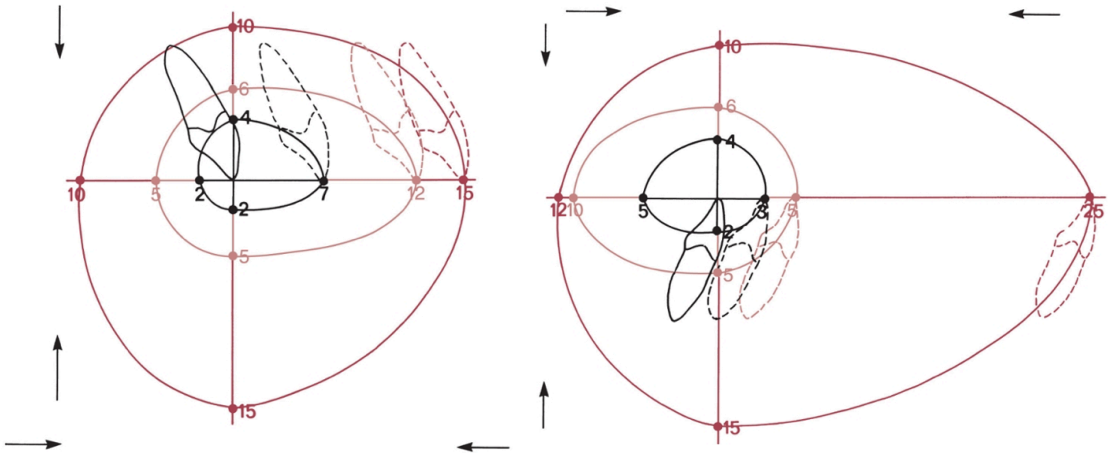
Combined Surgical and Orthodontic Treatment

Indications for surgery	- Orthodontic problems that are so severe that neither growth modification nor camouflage can help. - Surgery is not a substitute for orthodontics.

Development of surgery	- **Early 20th century**: Begin of body ostectomies for prognathisme.
	- **1957**: Sagittal split ramus osteotomy with IO approach:
	  ○ = Begin of the modern surgery.
	  ○ Possibility to lengthen or shorten the mandible.
	- **1960**: Improvement of mx surgery → Le Fort 1.
	- **1980s**: Movements of both jaws, the chin and the dentoalveolar segments possible.
	- **1990**: Rigid internal fixation.
	- **21th century**: Facial distraction osteogenesis.

The borderline patient: Camouflage vs. surgery	
Influencing factors	- Required tooth movement. - Patients age → growth modification possible? - Soft tissue limitations. - Facial appearance is more important than anchorage. - Soft tissue limitations often are a major factor in the decision for surgical or orthodontic tx.

Envelope of discrepancy	- Outlines the limits of hard tissue change towards ideal occlusion:
	  1. Orthodontic tooth movement alone
	  2. Orthodontic tooth movement + growth modification
	  3. Orthognathic surgery
	
	- Potential for tooth movement:
	  • Forward > backward
	  • Extrusion > intrusion
	  • Growth modification always includes both jaws → Same envelope.

	
Orthognathic surgery versus temporary skeletal anchorage	- The limits of orthodontic tx are much more a matter of facial appearance than anchorage. - Intrusion of posterior mx teeth is a good alternative to moving the mx up with a Le Fort 1 osteotomy (*Scheffler, 2014*). Anterior open bite > -6 mm → surgery or intrusion of mx and mn posterior teeth. - Protraction of the maxilla with cl.III elastics to skeletal anchorage is a good substitute for surgery if the mx deficit is not too severe. (*De Clerck 2010 & 2012*)
Esthetic and psychosocial considerations	• If esthetic is a major goal, changes of the nose or the soft tissues (plastic surgery) are may be necessary in addition to the jaw surgery. • <u>Older people:</u> Difficulty to adapt to significant changes in facial appearance. Minimize changes if possible. • <u>Younger people:</u> Wish to change in appearance with orthognathic surgery.