Class III skeletal malocclusion: Tips and traps

MA. Souissi* (Dr), M. Ben Rejeb** (Dr), J. Bouguila* (Dr), H. Khochtali† (Pr)

1 Service ORL et chirurgie maxillo-faciale, CHU la Rabta, Tunis, TUNISIE ;
2 Service de Chirurgie maxillo-faciale et esthétique CHU Charles Nicole, Tunis, TUNISIE ;
3 Service de Chirurgie Maxillo-Faciale et Esthétique de Sahelou, Sousse, TUNISIE

Introduction:
Class III skeletal malocclusion may present several etiologies, among which maxillary deficiency is the most frequent. This type of malocclusion is usually treated with association of orthodontics and orthognathic surgery. Relapse after surgery always has been a circumstance with which maxillofacial surgeons have had to deal. This study reviews the stability of orthognathic movements in Class III skeletal malocclusion using traditional osteotomies and fixation and compares them to what is currently in the literature.

Materials and methods:
In this report we present our experience in clinical 40 cases in which the orthodontic surgical treatment was indicated for correction of the class III skeletal malocclusion (34% among different types of orthognathic surgery). A review of the literature is done to complete this presentation.

Results:
The most frequent indication was Bimaxillary osteotomy (19). Maxillary advancement with or without rotation movement in asymmetric cases (14). Retrusion and anticyclicwise rotation of the mandible were indicated in some cases (7). 2 cases of relapse in the isolated SSBO, with end to end incisive relationship. Good occlusal function.

Clinical cases

Case 1:
Orthodontic treatment: 22 months (leveling, alignment, alveolar dental decompensation).
Maxillary advancement: 7 mm
Maxillary impaction: 4 mm
Mandibular setback (obwegeser/Daplont): 3 mm

Case 2:
Concave face with an interincisive point shift
Maxillary advancement: 3 mm
Bilateral sagittal split osteotomy mandibular symmetrisation

Case 3:
Skeletal and dental malocclusion class III
Maxillary retraction

Discussion:
In a Class III malocclusion, the mandibular teeth occlude the maxillary teeth by more than a half. This dental relationship is very often associated with a skeletal Class III disharmony involving the middle and lower thirds of the face, and sometimes the cranial base. Therapeutic alternatives for dento-skeletal Class III malocclusions include: orthopedic treatment in growing patients surgery in adults:
Maxillary advancement
Bilateral sagittal split osteotomy mandibular setback
Both +/- Genioplasty.

Complementary surgery such as Glossecoplasty in real macroglossy. It is fortunate that in most cases, relapse is within the ability of the orthodontist to finish the occlusion. Whether it is caused by muscle pull and function, lack of rigidity in fixation, or postsurgical growth, relapse is still known to occur.

Maxillary advancement:
Whether using maxillomandibular fixation and wire osteosynthesis or rigid internal fixation, maxillary advancement is a stable movement. According to data from the University of North Carolina, during the first postoperative year a 2- to 4-mm relapse movement occurred in 20% of patients, with 80% of patients experiencing no relapse[1]. Long-term follow up (1–5 years postoperative) revealed similar results. Ten percent of patients who had undergone a maxillary advancement had mild relapse at A point.

If large maxillary advancement is planned, the use of a step osteotomy with bone grafts placed within the step may prevent backward movement and facilitate rigid fixation[2].

Surgical tricks:
Maxillary advancement > Bilateral sagittal split osteotomy mandibular setback.
Osteotomy with bone grafts in maxillary advancement.
Controle condylar positioning+++ Prevent distal rotation of the proximal fragment Passive fit of bone segments Pterygoid muscles desinsertion Associated Glossecoplasty

Orthodontico-surgical stability hierarchy: According to Profit

+++ Maxillary impaction.
Maxillary advancement.
Maxillary impaction+mandib advancement.
Maxillary advancement+Mandible recession.
Maxillary recession.
Maxillary lowering.
--- Maxillary expansion.

Conclusion:
A correct diagnosis (skeletal, occlusal and orofacial dysfunctions), planning as well as an appropriate execution of the treatment plan are determinant factors for having success and long-term stability in class III skeletal malocclusion.