Recuperation of Buccal Opening (Hypomotility) with Myorelaxant Splint and Myofunctional Therapy

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The authors present a case report of recuperation of mandibular movements after trauma caused by a motorcycle accident. The patient was submitted to bucco-maxillo-facial surgery for the reduction of the fractures and maxillo-mandibular fixation. He was later treated with a myorelaxant splint and myofunctional therapy, resulting in a successful outcome.

Key Words: buccal opening, bucco-maxillo-facial trauma, myorelaxant splint, myofunctional therapy.

Introduction

Equilibrium of the stomatognatic system depends on the harmony of its parts (bones, muscles and teeth). Thus recuperation after accidental or surgical trauma aims at morphofunctional symmetry. Bell et al. (1983) cite the necessity of adequate muscular and occlusal rehabilitation to reinstate mandibular muscle function. This muscular recuperation has been shown to be important by Mayo and Carlson (1988), in experimental research with Rhesus monkeys, who concluded that atrophy of the masseter and temporal muscles occurs, if not used, after 5 weeks of maxillo-mandibular fixation.

Altmann (1988) propose that myofunctional therapy be applied in cases of orthognatic surgery, aiming at restoring normal functional and muscular equilibrium. Osborne (1989) alerts that physical therapy ought to be a routine procedure in orthognatic surgical cases and not only after a period of time when it is proven that the patient is unable to recuperate normal mandibular movements. In this manner, an occlusal splint complements the objectives of myofunctional therapy. According to Molina (1989) and Clark (1989), one of the most efficient treatments for dysfunction of the temporomandibular joint is the myorelaxant splint. The objective of this splint is to temporarily eliminate nociceptive information which can appear in the occlusal region of the teeth, in the periodontium, musculature, and ligaments responsible for mandibular movements and in the articular region (condyle - articular disc - glenoid cavity). The splint can thus position the condylar
head in a centric relation (CR), eliminate dental contact, avoid centric slipping, prevent interfering contacts of protrusion and lateral movements, reducing abnormal muscular activity and allowing relaxation.

The objective of this report is to present a clinical case of limited mandibular movement with the consequent loss of patterns of chewing and speech, due to trauma caused by an accident. The approach used aimed at the harmony of the orofacial structures, after surgery for the reduction of the fractures, through combined action of odontologic treatments and phonoaudiologic myotherapy.

Case Report

The patient, a 17-year old male, was involved in a motorcycle accident and suffered bilateral fracture of the menton and subcondylar region and a loss of the inferior central incisors and fracture of the upper central incisors. Surgery to reduce the mandibular fracture was performed the day after the accident at Hospital das Clínicas de Ribeirão Preto.

Forty-five days after surgery, the maxillo-mandibular fixation was removed and the patient was sent to the Service of Occlusion and TMJ Disturbances (FORP-USP). The patient presented difficulty in buccal opening and TMJ pain. Clinical examination showed: 4-mm buccal opening, reduced lateral and protrusion movements, alteration of chewing and speech.

Myofunctional therapy was applied by a speech pathologist to prevent possible difficulties later, as is indicated in the literature. At the same time, restoration of the left upper central incisor was begun with the placement of a preliminary acrylic autopolymerized crown. A space maintainer was inserted in the antero-inferior region of the lost elements. After 20 days, a myorelaxant splint was installed.

Myotherapy aims at the recuperation of mobility, tone and posture of the orofacial musculature, with the following procedure:

1) Application of warm heat for 20 min, followed by circular massage of the facial muscles, increasing peripheral circulation, muscular relaxation and increasing pain threshold.

2) Biting exercises with the molars, using a soft 0.5-cm diameter latex tube the first month and then passing to a firmer 0.9-cm tube, which requires greater and more vigorous movements.

3) Sucking an orthodontic pacifier (Chuca Ortodontica, Chuca Produtos Infantis Ltda., Brazil), which stimulates successive movements of lowering and elevation of the mandible.

4) Slow movements of opening and closure of the mouth for 1 min.

5) Lateralization of the mandible to one side for 30 seconds, repeating 5 times, and then to the other side for 5 times. Contra-resistance exercises were not used.

Besides these procedures, other isometric and isotonic exercises were used in order to eliminate trisma of the orofacial musculature which prevents the execution of normal functions and elongation of the muscle fibers. Even though the swallowing function was
preserved, this was included as an exercise in order to avoid that either by pain or movement difficulty, the patient would begin to execute this movement atypically, as well as other reflex-vegetative functions and speech. The myotherapy sessions were carried out weekly with the patient performing the exercises at home several times a day.

From the 20th day, myofunctional therapy and the use of a myorelaxant splint were begun concomitantly. A splint made by the vacuum system was chosen due to the limitation of the patient’s buccal opening making modeling difficult for the confection of plaster models necessary for the waxing of the pressed splint. The making of a splint by vacuum is done using a Bio-art apparatus, with a 1.5-mm thick colorless resin plate. This was then cut and adapted to the maxillary arch of the patient. Autopolymerized acrylic resin was added until it reached a thickness of 2.5 mm, satisfactory for the relaxing of maxillo-mandibular functions, with guides of desocclusion of anterior and lateral movements in the canines. Splint adjustment was made in the central occlusion at the first session, due to difficulty in manipulating the mandible. Weekly adjustments of CR were made as the patient began to show better mandibular movement.

Results and Discussion

On initial consultation, the buccal opening was 4 mm and the patient complained of pain (Figure 1A,B). After 12 days of myofunctional therapy, the measurement of buccal opening was 18 mm (Figure 1C) and the pain had disappeared. Note that this improvement could also be related to the actual evolution of a post-operative case, by the removal of maxillo-mandibular fixation.

On the 20th day, a myorelaxant splint was installed and at this time the patient had a 25-mm opening. He continued with myofunctional therapy, now associated with a bite splint and on the 34th day the patient had a buccal opening of 30 mm and on the 60th day, 38 mm. At this time, use of the splint was discontinued; however, the patient was instructed to continue the myofunctional exercises.

The patient returned to the Service of Occlusion and TMJ Disturbances, 60 days after discharge, and was re-evaluated. He presented a buccal opening of 45 mm (Figure 1D), normal eccentric movements, reflex-vegetative functions and speech.

The objective of myofunctional therapy is to establish muscular normality after trauma and immobilization of the mandible, through natural functions of respiration, sucking, swallowing and chewing, which allow the recuperation of the involved musculature. According to Greene (1979), this allows “the establishment of a normal and harmonious bucco-facial musculature”.

According to Molina (1989), the use of a myorelaxant splint aids in muscle tone, maintains the mandible in a resting position for a longer time and the condyle in the glenoid cavity in a less traumatic position. Mandibular movements were made without occlusal interference (straight plane), with a desocclusion guide on the canines, impeding any locking.
Figure 1. Patient with fracture of maxillary central incisors and loss of mandibular central incisors. A, Initial buccal opening of 4 mm. B, Buccal opening of 18 mm after 12 days. C, D, Opening of 45 mm after 60 days.
Conclusions

1. Myotherapy re-restablished muscular equilibrium, allowing functional movements of the mandible.
2. The myorelaxant splint aids in the centric repositioning of the condyles in the glenoid cavity and in the position of mandibular rest, without interference in lateral and protrusion movements, with only canine guides of desocclusion.
3. The association of these two therapies favored the equilibrium of the stomatognatic system in this case, and can lead to more research associating specialties in the treatment of temporomandibular joint disturbances.

References


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