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Case report of patients treated with an orthodontic and myofunctional protocol

ABSTRACT

Backgound *Occlusion alterations can be associated to bad habits (such as thumb sucking, oral breathing, atypical swallowing and labial interposition) which can lead to functional anomalies.*
Case report *Three cases are reported with the good results of myofunctional and orthodontic therapy.*
Conclusion *When there are bad habits, orthodontics should be combined with a myofunctional therapy.*

Keywords *Malocclusion; Myofunctional therapy; Oral habits.*

Introduction

Malocclusion is an anomalous relationship between upper and lower teeth caused by either dental and/or alveolar causes. Occlusions are classified as Class I (normal occlusion), Class II (distal occlusion) and Class III (mesial occlusion) either with or without displacement and maxillary contraction. These alterations can be associated to bad habits (i.e. thumb sucking, oral breathing, atypical swallowing and labial interposition) which, if continuously repeated, can lead to functional anomalies of the orofacial musculature [Josell, 1995; Warren at al., 2005]. To solve these bad habits, we can refer to either functional and fixed orthodontic appliances which, if needed, can be combined with myofunctional therapy to recover the normal function of the oral muscles. The myofunctional therapist's role and specific related exercises play a key role [Mason, 2008]. For the success of the therapy this type of interdisciplinary approach is very important to avoid any relapse which can occur after orthodontic treatment when bad habits have not been removed.

This paper reports three cases treated with a protocol meant to solve these oral habits; in particular, our aim was to assess the effectiveness of myofunctional treatment in subjects with atypical swallowing.

Materials and methods

Three patients with atypical swallowing were treated; the diagnostic-therapeutic protocol included the following.

- Collection of diagnostic records: extra-oral and intra-oral photographs, plaster models, cephalometric analysis on lateral cephalogram, assesment of the contraction of the labial orbicular muscle, tongue position analysis.
- Correction of the habit which, if not solved, could compromise the success of the therapy (i.e. maxillary contraction, oral breathing).
- Different therapeutic approach on the basis of skeletal and dental features:
  - the first case was treated only with myofunctional therapy, which consisted of speech therapy exercises, in order to correct a dental Class II and the lateral open bite;
  - the second case was treated with a removable orthodontic appliance and myofunctional therapy to correct the anterior open bite;
  - the third case was treated with rapid palatal expander to correct the maxillary contraction, and with a removable orthodontic appliance and myofunctional therapy to correct the anterior open bite and the Class II malocclusion.
- Follow up after a year of treatment with new diagnostic records: extra-oral and intra-oral photographs, plaster models, cephalometric analysis on lateral cephalogram, measurement of the contraction of the labial orbicular muscle, tongue position analysis.

Case reports

Case 1

GLM, male, aged 13 years, skeletal Class II, right dental Class II, late mixed denture, overjet 4 mm, overbite 3 mm, presented atypical swallowing with lateral tongue position (Fig. 1, 2, 3); he was treated with 2 cycles, 10 sessions each, of myofunctional therapy during which the functional rehabilitation of the orofacial musculature was achieved [Giunca et al., 2008]. At the end of the therapy the patient presented right dental Class I and lateral bite closure (Fig. 4, 5, 6) and an increase in labial orbicular muscle contraction: from 500 g before therapy, to 800 g after therapy.

FIG. 1-3 Case 1 pre-therapy.

FIG. 4-6 Case 1 post-therapy.

Case 2

F.A., male, aged 8, skeletal and dental Class I, mixed dentition, overjet 1 mm, overbite -6 mm. Patient with atypical swallowing, anterior tongue position and thumb sucking (Fig. 7, 8, 9). The patient was treated for 5 months with a palatal crib and Fränkel III appliance, which the patient did not wear for the required hours; the overbite was 0 mm [Ngan and Fields, 1997; Huang et al., 1990] (Fig. 10, 11, 12). Afterwards he underwent two cycles, ten sessions each, of myofunctional therapy, during which functional rehabilitation of the orofacial muscles was achieved. At the end of the therapy the patient had a 2 mm overjet and overbite (Fig. 13, 14, 15). There was an increase in labial orbicular muscle contraction: from 800 g before therapy, to 1200 g after therapy.

Case 3

P.E., female, aged 9 years, showing skeletal and dental Class II, maxillary contraction, mixed dentition, overjet 5 mm, overbite -3 mm. Patient with atypical swallowing, anterior tongue position, thumb sucking and oral breathing (Fig. 16, 17, 18). The patient was treated with palatal rapid expander for 6 months; the overbite was -2 mm (Fig. 19, 20, 21); then he underwent 3 cycles, 10 sessions each, of myofunctional therapy during which functional rehabilitation of the orofacial musculature was achieved; the overbite was 0 mm [Klocke at al., 2000] (Fig. 22, 23, 24). There was an increase in labial orbicular muscle contraction: from 550 g before therapy, to 800 g after therapy. The patient is still under treatment with removable orthodontic appliance to solve the dental and skeletal Class II.

Results

Following the analysis of the three cases it can be stated that a combined orthodontic and myofunctional treatment permits to obtain a better therapeutic result.

FIG. 7-9 Case 2 pre-therapy.

FIG. 10-12 Case 2 inter-mediate.

FIG. 13-15 Case 2 post-therapy.

FIG. 16-18 Case 3 pre-therapy.

FIG. 19-21 Case 3 inter-mediate.

FIG. 22-24 Case 3 post-therapy.

The good result of the first case was possible due to the patient's compliance and to the right timing of the therapy, but it was possible to achieve the correct right canine occlusion only with myofunctional therapy. Myofunctional therapy was applied in the second case after orthodontic therapy with palatal crib and Fränkel III appliance after slightly reducing the anterior open bite to create an anterior block; thanks to myofunctional therapy good overbite and overjet were obtained. In the third case it was necessary to expand first the palatal arch and then obtain a good occlusion with myofunctional therapy.

Discussion

Orthodontic therapy, in presence of bad habits (i.e. thumb sucking, oral breathing, atypical swallowing, labial interposition) and dysfunction of orofacial muscolature, is not sufficient to solve the orthodontic issues. In these cases, it should be combined with myofunctional therapy

The success of the therapy is guaranteed only when:

- the patient is complying;
- all factors which can prevent the success of the therapy are removed (i.e. maxillary contraction, short lingual fraenum);
- there is cooperation between orthodontist and myofunctional therapist;
- the specialists is aware of all these issues.

Conclusion

Myofunctional therapy is a valid support to the orthodontic treatment in cases with functional bad habits and it can lead to very good therapeutic results. However, it is not always applicable, as for instance when atypical swallowing is combined with tongue thrust, since its origin may not be functional but anatomical (such as a short lingual fraenum); in children with severe open bite, myofunctional therapy can be effective only after the occlusion has been corrected. The same can be said when atypical swallowing is associated to a narrow maxilla: the myofuntional therapy can start only after the palate has been expanded. Moreover, essential to the success of the therapy are:

- patient's and patient's family compliance to the home therapy;
- cooperation between the medical staff involved in each case whenever interdisciplinary treatment is required;
- resolution of related pathologies (i.e. maxillary contraction, short tongue fraenum, oral breathing caused by adenoides and/or tonsillar hypertrophy).

In the light of the three cases taken into consideration, we can say that to obtain an effective therapeutic result, a correct diagnosis and the correct timing to start the therapy are paramount.

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