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LETTER TO THE EDITORS

Is it possible to prevent obstructive sleep apnea with maxillomandibular orthopedic treatment during childhood?

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Several conditions, comprising obesity, cervical soft tissue accumulation, nasal obstruction, and craniofacial abnormalities, increase the risk for obstructive sleep apnea (OSA). The maxillomandibular anteroposterior and vertical disproportions are one of the most frequent craniofacial abnormalities and generally appear due to an alteration in the mandible growth. Thus, a decrease in oropharyngeal space is often observed [1] which predisposes to OSA. Although transversal alterations also play an important role in the OSA development and the treatment with rapid maxillary expansion shows great results, in the present letter, we discussed only mandibular deficiencies.

In dentistry, the diagnostic classification of these craniofacial abnormalities is still controversial, ranging from the relationship between the first permanent molars (Angle's classification) to the cephalometric measurements and subjective analysis of the facial morphology [2]. This absence of an optimization of the diagnostic criteria for craniofacial abnormalities impairs the comparisons among different studies and hampers the evaluation of the maxillomandibular treatment effectiveness.

In growing patients, one of the craniofacial abnormality treatments consists in moving the mandible forward to an anterior position by fixed or removable maxillary orthopedic appliances [3]. Although controversial, this advancement likely increases the anterior mandible position in relation to the maxilla and to the skull base by promoting mandible growth and dentoalveolar remodeling. This process also could promote a soft tissue organization and a sagittal malocclusion improvement which lead to oropharyngeal space increase, facilitating a normal air flow [3]. Hence, maxillomandibular correction represents an important and effective treatment to snore and OSA during childhood, as previously demonstrated in children with 4 to 10 years treated with removable oral appliances during 6 months [4, 5].

Recently, it has been suggested that the therapeutic intervention to correct skeletal abnormalities in children and adolescents not only could treat the current problems of snore and OSA during childhood and adolescence but also could have a long-term effect, preventing these obstructive events even in adulthood [6]. The mechanism of this possible association would be the maxillomandibular correction persistence by the morphological stabilization of face growth and maturation. This hypothesis, however, still lacks objective evidences. In the studies of Villa and colleagues (2002) and Cozza and colleagues (2004), the authors only observed the short-term effect of oral appliances treating the snore and OSA and did not investigate the skeletal maxillomandibular correction in children and its stabilization. Although the immediate outcomes of these treatments performed in the growing face are clinically satisfactory for snore and OSA, including significant changes in linear and volumetric dimensions of oropharyngeal spaces [3], the long-term effectiveness of this therapy is still unclear.

Another possibility is that the maxillomandibular correction during childhood and adolescence could not persist until adulthood, considering that the craniofacial pattern seems to have a predominant genetic determination (Fig. 1) [7]. In this case, even promoting the advancement of the mandible during childhood for treatment of skeletal abnormalities or of OSA and snore, the genetic determination could contribute to a progressive return to the initial maxillomandibular disproportions in

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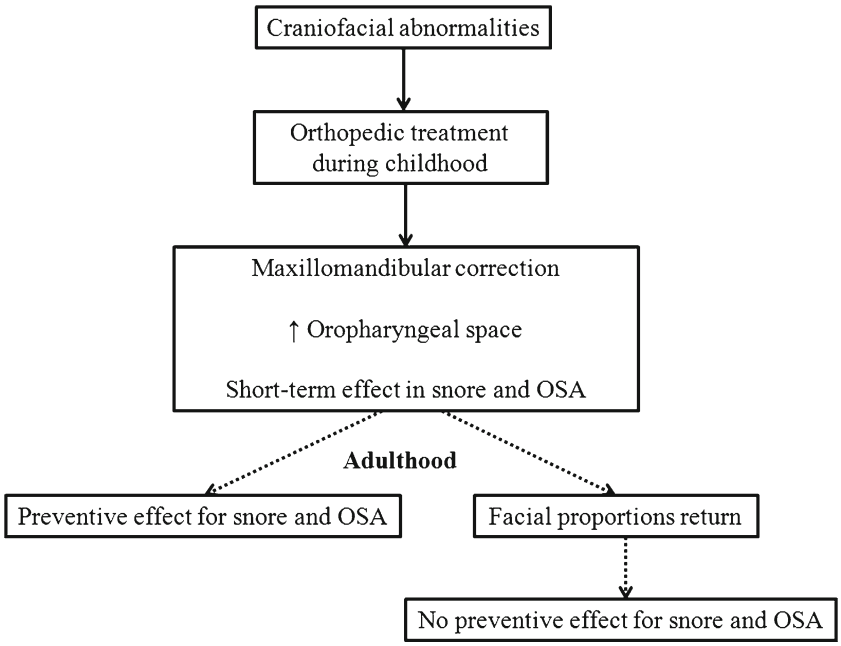

Fig. 1 Schematic representation of craniofacial abnormality treatment and effects in the facial disproportion correction and improvement of snore and OSA during childhood and adulthood. *Dotted arrow* corresponds to the two hypotheses about the effectiveness of maxillomandibular correction preventing snore and OSA in adulthood. *OSA* obstructive sleep apnea

adulthood, maintaining the risk for OSA by causing upper airway narrowing and decreasing its permeability.

There is no doubt that treatment with mandibular advancement during childhood and adolescence should continue to be performed and is still the best conduct when the diagnosis indicates mandibular retrusion, snore, and OSA. However, the debate about the prognosis and the positive effects of this long-term intervention for OSA remains uncertain. While this association is not clear, we believe that patients treated with these conditions during the growing phase should be evaluated periodically to be, if necessary, instituted new clinical interventions to control dysgnathia and consequently the incidence of OSA.

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