Infantile swallowing: surgical meaning

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Abstract

Aims. The aim of this retrospective work on 30 patients affected by dento-skeletal III class and Infantile Swallowing (I.S.), treated between 2006 and 2014, is to analyze the causes of eventual surgical relapses and to underline the consequences of untreated Infantile Swallowing. Infantile Swallowing can be correlated with a relapse in the surgical treatment and therefore requires investigation and treatment beforehand any surgical approach.

Methods. Between the 2006 and 2014 a number of 30 patients affected by III dento-skeletal class and I.S. were treated with a pre-surgery protocol, surgery and a post-surgery protocol. The surgical protocol consisted of: Le Fort I and Bilateral Sagittal Split Osteotomy (BSSO). Out of the 30 patients 3 received previous surgical treatment in another locality without going through pre- and post-surgery protocols for I.S., and they presented themselves about 14 months post-surgery to the first examination having a relapse of the dento-skeletal III class.

Results. No skeletal relapse has ever been recorded today in the 30 patients treated with pre and post-surgery protocols and Le Fort I and BSSO osteotomy.

Conclusions. Relapses are commonly attributed to surgical errors or inappropriate surgical program only; in our analysis we observed that the 100% of relapses were due to an untreated or undiagnosed I.S. that caused derangement of bicortical screw and incorrect bony formation and consequently a sort of an improper “distraction osteogenesis”.

Key words: postsurgical relapse, III dento-skeletal class, Infantile Swallowing, Atypical Swallowing

Introduction

An Angle class III malocclusion can exhibit a variety of skeletal and dental characteristics including a large or prognathic mandible, a retrusive maxilla, a protrusive mandibular dentition, a retrusive maxillary dentition or a combination of these components (1,2). Etiology of this defect is due to genetic or acquired factors that determine an increase of bone apposition on the jaw bone.

The incidence of class III malocclusion varies amongst ethnic groups with 1% to 4% ratio in Caucasian populations, and 4% to 14% in Asians (1). Relapses in orthognathic surgery, after treatment of III dento-skeletal class, are caused by errors in cephalometric preoperative evaluation, errors in pre or post-operative orthodontic treatment, inadequate positioning of elastic bands in patients with uneven masticatory forces (3-5) and of course: inadequate surgical performance.

Infantile swallowing can modify craniofacial structures in subjects undergoing development (4-7) in accordance with Literature (8). The study wants to assess the role of persisting of Infantile Swallowing (IS) related to postsurgical mandibular relapse of dento-skeletal III class.

The aim of this current study is to underline the importance of a correct diagnosis and treatment of I.S. in patients that need to endure a surgical therapy for the orthognathic correction of an III dento-skeletal class.

Materials and methods

In order to evaluate the aforementioned statement, between 2006 and 2014 a number of 30 patients affected by III dento-skeletal class were treated at the department of Maxillo–Facial Surgery of S. Andrea Hospital in Rome, II Faculty of Medicine and Surgery of University of Rome “la Sapienza”. Patients were divided into 40% males and 60% females, with an average age of 27, ranging between 18 and 38. These 30 patients were further subdivided between: 27 patients who never received previous surgical treatment consisting of Le Fort I and BSSO and 3 patients who previously underwent said treatment. Inclusion criteria for all patients consisted of untreated I.S. and a dento-skeletal III class. Exclusion criteria were: any previous treatment of both logopedic or orthodontic nature, any traumatic even which affected the maxilla.

The 3 patients who were previously treated elsewhere for dento-skeletal III class with Le Fort I and BSSO osteotomy
showed at the time of our first evaluation a relapse.

These 3 patients were females with an average of 23 years old; the evaluation was carried out at about 13 months from the previous surgery for the III dento-skeletal class. All 3 presented I.S. at the time of evaluation. Such patients underwent surgical treatment consisting in bicortical screws removal, revision of BSSO, new fixation with four bicortical screws per side, due to I.S., a mandibular maxillary fixation was needed and maintained for 40 days.

All 30 patients were subject to pre-surgery and postsurgery protocols. The pre-surgery protocols consisted of orthodontic therapy and logopedic therapy 12 months prior surgery in order to correct I.S. beforehand the surgery. The post-surgical therapy consisted of orthodontic maintenance and logopedic sessions in order to ensue the complete removal of the I.S. stimuli.

After surgery all patients were dismissed in 5th postoperative day and underwent to the same clinical and radiological follow-up consisting in radiographic post operative control on the first postoperative day, at third, sixth and twelfths month after surgery. Postsurgical orthodontic therapy was carried out until the sixth postoperative month, in average. In all cases there was no evidence of complications or relapses, for the last seven patients the follow-up is still ongoing.

Results

No skeletal relapses have ever been noticed today in the 30 patients. In the 27 patients treated with Le Fort I and BSSO osteotomy, average upper jaw movements were 2.07mm advancement (min 1mm - max 4mm), anterior elevation 1.4mm (min 1mm - max 2mm) posterior elevation 1.3mm (min 1mm – max 2mm).

In the patients with mandibular relapse no upper jaw movements were required. During surgical treatment in these 3 patients’ derangement of 2 or 3 bicortical screws per side was always observed. Logopedic treatment started after removal of maxilla-mandibular fixation on 40th operatory day and solved I.S. in the three patients.

Discussion

I.S. is a physiological phenomenon, an innate human behaviour observable in the very first moments of life, when, after delivery, the child starts to search feed from mother’s breast (7,9).

Basically, three swallowing patterns have been described: infantile, somatic, and inconstant (10). I.S. is that which exists at birth and is also termed “atypical swallowing”. It is characterized by a forward movement of the tongue tip functioning as an anterior “seal” during the swallowing process. An infantile type of swallowing can persist well after the sixth year of life, however, it is then considered as a process. An infantile type of swallow can persist well after functioning as an anterior “seal” during the swallowing is characterized by a forward movement of the tongue tip pressure on symphyseal mandibular region. As others reported, the tongue anterior-pulsion has a strength of 2,4 kg circa. Such muscular tension has been employed in the past for correction of retrognathia trough appliance of particular orthodontic devices. (1,2,7,9).

Conclusions

The presence of IS in patient with III dento-skeletal class that have to undergo to orthognathic surgical treatment imposes the immediate orthodontic therapy and whenever logopedic treatment when needed, for suppression of this atypical swallowing scheme (1-3).

Relapses are commonly attributed to surgical errors or inappropriate surgical program (4,5,13), only in our analysis we observed that the 100% of relapses were due to an untreated or undiagnosed IS that caused derangement of bicortical screw and incorrect bony formation and consequently a sort of an improper “distraction osteogenesis”. Surprisingly the screw derangement has not caused any infectious process. Lack of diagnosis, lack of treatment or an inadequate treatment of IS can cause postsurgical relapses (8).

Observation of tongue movements during swallowing with the lips apart is the simplest clinical method for diagnosing infantile swallowing. This simple procedure can efficiently avoid a risk of relapse in patients that had to undergo to surgical procedure of III dento-skeletal class correction.

References

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