

Proceeding Paper

# The Treatment of Anterior Open Bite Associated with a Thumb Sucking Habit: A Case Report <sup>†</sup>

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**Abstract:** Anterior open bite malocclusion, defined as a lack of vertical overlap or contact between the maxillary and mandibular incisors, has a multifactorial etiology. A 17-year-old female patient came to the Egas Moniz University Clinic complaining of anterior open bite. The patient had posterior crossbite on the left side, second premolar agenesis, the presence of a primary molar, and a thumb-sucking habit. This case report describes a nonsurgical orthodontic treatment of an anterior open bite, applying a fixed appliance and bonded acrylic expander.

**Keywords:** open bite; posterior crossbite; thumb sucking; orthodontic treatment



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## 1. Introduction

Anterior open bite malocclusion is characterized by the lack of definition when there is no contact in the anterior dental region between the dental arches when the posterior teeth are in occlusion [1]. Anterior open bite impacts oral function and can influence the quality of life of orthodontic patients [2].

Open bite is a malocclusion with several etiologic factors, such as a thumb-sucking habit, lingual interposition habit, mouth breathing, or due to genetic influence. A detailed diagnosis and anamnesis in patients with anterior open bite is very important to uncover the etiology of the anterior open bite [3].

The aim of this article is to report a case of an open bite with a thumb-sucking habit treated with a nonsurgical orthodontic treatment.

## 2. Materials and Methods

A 17-year-old female patient came to the Egas Moniz University Clinic complaining of anterior open bite. The patient had a bilateral molar and canine class I, posterior crossbite on the left side, lower left second premolar agenesis with the presence of a primary molar, and a straight facial profile. Furthermore, the patient had a severe transverse maxillary deficiency (Pont's Premolar Index:  $-7.3$  mm; Pont's Molar Index:  $-13.1$  mm), proclined upper and lower incisors, and a hyperdivergent class I skeletal pattern. The patient had a thumb-sucking habit during sleep. Regarding the functional examination, she reported bilateral pain on the Temporalis muscle and TMJ palpation.

The patient refused the first treatment plan proposed, combining the orthodontic treatment with an orthognathic surgery, as well as the extraction of the primary molar. Conversely, the patient accepted a non-invasive approach to also correct the posterior discrepancy and its effects. The orthodontic treatment was initiated after obtaining signed informed consent from the legal guardian of the patient.

### 3. Results

The orthodontic treatment intruded the molars and corrected the posterior discrepancy, with an extraction of the third molars to treat the anterior open bite. Firstly, the orthodontic treatment involved a multibracket mandibular fixed appliance and a bonded acrylic maxillary expander with a tongue grid to intrude the molars and correct the thumb-sucking habit. Secondly, the upper multibracket fixed appliance was bonded. Upper removable and lower fixed retainers were placed at the end of the treatment. The tongue posture was corrected using miofunctional speech therapy. The treatment duration was 29 months.

### 4. Discussion

According to the literature, open bite malocclusion presents a prevalence of 6% in permanent dentition and 3% in mixed dentition [4,5].

In adult patients, severe anterior open bite cases are often treated with orthognathic surgery [6]. Notwithstanding this, orthodontic treatment with molar intrusion and the correction of posterior discrepancy appears to be a good alternative, with founded long-term stability [3,7,8].

In this case report, the anterior open bite was treated with orthodontic camouflage and without any orthognathic surgery. Treatment stability was present with a follow up of 24 months (Figure 1).



**Figure 1.** Before and after orthodontic treatment records: (a) Initial intra-oral photographs; (b) Intra-oral photographs during orthodontic treatment; (c) Final intra-oral photographs; (d) Initial facial photographs; (e) Final facial photographs; (f) Initial orthopantomography; (g) Final orthopantomography; (h) Initial cephalometric radiography; and (i) Final cephalometric radiography.

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