



## Université de Montréal

### **SKELETAL AND DENTOALVEOLAR EFFECTS OF SARPE: A CONE BEAM COMPUTERIZED TOMOGRAPHY EVALUATION**

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**Introduction:** Few research projects have evaluated the effects of surgically assisted rapid palatal expansion (SARPE) on hard tissues, and most of these projects suffer from significant methodological flaws. The objective of this clinical prospective comparative study was to evaluate the effects of SARPE three-dimensionally on the maxillary teeth, their supporting alveolar bone as well as the basal bone of both maxillae.

**Materials and Methods:** The sample consisted of 14 subjects (mean age:  $23.0 \pm 1.9$  years). The patients were treated using a Hyrax expansion appliance and a retention period of one year without any other orthodontic treatment was observed. A cone-beam computed tomography (CBCT) evaluation was performed before and 6 months after the end of expansion. Thirty-seven hard tissue parameters were measured on the three-dimensional volumes.

**Methods:** Subjects were 604 patients aged 7 to 17 years presenting for orthodontic screening in a university clinic. The parents completed a health and sleep behaviour questionnaire prior to the child being evaluated in the orthodontic clinic.

**Results:** Radiological results have demonstrated a significant increase in dento-alveolar inclination and in dental, alveolar and skeletal widths of the maxilla, with a tendency towards a gradually increasing expansion supero-inferiorly and postero-anteriorly. No significant sagittal displacement of anatomic landmarks located of the maxillae, nor any significant correlation between expansion screw activation and radiological parameters were found.

**Conclusions:** SARPE causes buccal dentoalveolar tipping in the posterior superior region and significant transverse expansion on all hard tissues of the maxilla. However, SARPE does not induce any relevant sagittal movement of the maxilla and the mandible. The changes that were observed do not have a correlation with expansion screw activation.

### **MANDIBULAR MORPHOLOGY AND GROWTH RELATED TO HYPODONTIA AND RESPIRATORY DISTRESS IN SUBJECTS WITH PIERRE ROBIN SEQUENCE**

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Pierre Robin Sequence (PRS) consists of a triad of distinctive symptoms that are expressed concurrently: micrognathia, glossoptosis – causing respiratory distress – and cleft palate.

The hypothesis of this study is that mandibular morphology and growth in subjects with PRS varies with the severity of respiratory distress and mandibular hypodontia.

The experimental group consisted of 32 patients with the non-syndromic form of PRS (15 males, 17 females). Cephalometric tracings were performed at T1 (mean 7.8 years) and T2 (mean 12.6 years).

Statistical comparisons were made using one-way ANOVA; the significance level was set at  $p < 0.05$ .

Patients with PRS and mandibular hypodontia when compared to those with PRS and normal dentition, have a shorter posterior cranial base (observed at T2 only), a shorter mandibular body, a larger ANB angle, a shorter lower facial height, a higher facial convexity, a higher A-B(HP) value and a longer Y-axis. All these clinical characteristics don't normalize with growth. Patients with a severe respiratory distress compared to those with a mild respiratory distress observed at birth have a shorter ramal length and a higher gonial angle. These clinical characteristics are inexistent at T2.

In conclusion, mandibular morphology and growth in subjects affected by PRS and mandibular hypodontia is different than those affected by PRS with normal dentition. This results in a more severe Class II jaw relationship that does not normalize with growth. In addition, the severity of respiratory distress observed at birth affects future mandibular morphology but only in a transitory manner.