**\*\*Methodology\*\***

This study primarily aimed to review the practices, successes, failures, and methodologies related to gingivoperiosteoplasties with bone grafting over the past 12 years at Rouen’s University Hospital. Our goal was to glean insights that could inform and enhance future surgical approaches.

Two secondary objectives further informed our analysis. First, we analyzed the outcomes of gingivoperiosteoplasties using three-dimensional imaging. This involved comparing preoperative Cone Beam Computed Tomography (CBCT) scans with postoperative scans at varying intervals. Second, we evaluated the efficacy of a recent practice modification involving the intraoperative removal and repositioning of orthodontic maxillary expansion devices during gingivoperiosteoplasty procedures.

To achieve these objectives, we utilized a mixed approach, employing both quantitative methods, such as three-dimensional imaging analysis, and qualitative methods, which involved reviewing and evaluating our surgical procedures and practices over the years.

The study featured a retrospective review of patients who underwent gingivoperiosteoplasties with bone grafting for cleft lip and palate at the Rouen Competence Center during a 12-year period. The inclusion criteria were patients who had available preoperative and postoperative CBCT scans and had undergone gingivoperiosteoplasty at the center. Patients were excluded if the procedure was performed by an operator other than the main operator, a bone graft harvest site different from the iliac crest, secondary gingivoperiosteoplasty (reoperation), and postoperative follow-up of less than or equal to 6 months.

We collected patient demographic information, such as age at the time of surgery, sex, and the specific type of cleft lip and palate. Data on the surgical technique used, the duration of the surgery, and any recorded complications were also gathered for review. The detailed analytical methodologies, including the techniques used for imaging analysis and the thematic framework adopted for the qualitative review, are elaborated in the subsequent sections.

**\*\*Quantitative Analysis\*\***

Our quantitative analysis focused on assessing the outcomes of gingivoperiosteoplasty procedures through a comparative study of preoperative and postoperative CBCT scans. The first author was trained in the use of the specific imaging software 3D SLICER version 5.3.0-2023, and following a 2-week training period, she independently segmented the scans and reconstructed the three-dimensional images. Specific outcome variables were defined and measured on these images, using a set of standard landmarks. Details of the measured variables and the landmarks used are described in Appendix 1.

To ensure consistency and reliability in measurements, a repeat measurement was carried out after a 2-week interval by the same author on the same set of CBCT scans. The degree of agreement between the first and second measurements was assessed using the intraclass correlation coefficient (ICC). An ICC value of above 0.75 was considered indicative of good reliability, following the guidelines proposed by Koo and Li (2016).

[A Guideline of Selecting and Reporting Intraclass Correlation Coefficients for Reliability Research - PMC (nih.gov)](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4913118/)

Descriptive statistics were used to summarize the demographic and clinical characteristics of the study population. Paired t-tests were used to compare ……... The impact of various demographic and clinical variables on the outcomes was also assessed using ….......... All analyses were carried out using the R 4.1.3 statistical software on a Windows 11 machine, and all tests were treated as two-tailed tests with a significance level of 0.05.

**\*\*Qualitative Analysis\*\***

The qualitative component of the study involved a comprehensive review of surgical practices and methodologies used over the past 12 years. We also analyzed the evolution of methodologies over the years and the adoption of new practices such as the intraoperative removal and repositioning of orthodontic maxillary expansion devices.

**\*\*Ethics\*\***

The study protocol was reviewed and approved by the Ethics Committee at the Rouen University hospital. All procedures performed in the study involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.