SDM
College of Dental Sciences & Hospital
Dhavalnagar, Sattur, Dharwad - 580009, Karnataka, INDIA
Recognised by Dental Council of India, New Delhi

SHRI
DHARMASTHALA
MANJUNATHESHWARA
UNIVERSITY

SHRI DHARMASTHALA MANJUNATHESHWARA UNIVERSITY,

DHARWAD, KARNATAKA

EVALUATION OF PHARYNGEAL AIRWAY CHANGES FOLLOWING ORTHOGNATHIC SURGERY

By

DR. ALKA AJITH

Dissertation Submitted to the

Shri Dharmasthala Manjunatheshwara University, Dharwad, Karnataka,

In partial fulfilment

of the requirements for the degree of

MASTER OF DENTAL SURGERY (M.D.S)

In

ORAL AND MAXILLOFACIAL SURGERY

Under the guidance of

DR. ANIL KUMAR DESAI

PROFESSOR AND HEAD OF DEPARTMENT

DEPARTMENT OF ORAL AND MAXILLOFACIAL SURGERY

S.D.M COLLEGE OF DENTAL SCIENCES AND HOSPITAL,

SATTUR, DHARWAD.

MAY 2022

ABSTRACT

Background: Surgical movement of the jaws for the correction of maxillofacial discrepancies can have a major influence on the airway. Prior to surgery, the airways require a detailed analysis for any potential obstruction and development of any sleep disturbance disorders.

Objectives: To quantify the changes at the nasopharyngeal, oropharyngeal and hypopharyngeal airway levels after orthognathic surgery using lateral cephalograms and computed tomography and to assess the changes in quality of sleep following orthognathic surgery using polysomnography.

Materials and Methods: The pharyngeal airway of 15 patients who underwent orthognathic surgery were assessed in a prospective study from 2019 to 2021. Pre-operative computed tomography scans, lateral cephalograms and polysomnography studies were done and compared to the same parameters 6 months post-operatively.

Results: The average pre-operative width of airway at the nasopharynx level showed a mean increase of 6.13mm, and on analysis with the paired t-test, it was statistically significant($p=0.01$). A similar significant change was noted at the hypopharynx, with a mean increase of 1.73mm($p=0.25$). The lowest desaturation, however, increased from an average of 77.27 % to 84.47% (mean: 7.2), which was statistically significant. Bimaxillary surgeries done with a mandibular setback of 5.25±1.83 mm accompanied by maxillary advancement of 5.44±1.18mm have shown an increase in volume by 3.3% at the nasopharynx and 9.03% at oropharynx level with an overall increase of 2.78% increase in total airway volume, whereas the hypopharynx showed a 24.6% decrease in volume. In polysomnography, a 39.7% decrease in AHI index, 6% increase in the lowest desaturation, and a 5% decrease in the ODI were also noted along with a 13% improvement in sleep efficiency.

Conclusion: Orthognathic surgery has an inevitable influence on the upper airways and thorough evaluation of the three dimensional structure is warranted, using appropriate imaging and diagnostic modalities in order to accurately diagnose any risk of sleep disturbances and incorporate adjunctive procedures into the treatment planning.

Key words: orthognathic; pharyngeal airway; polysomnography; computed tomography; cephalometry