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Morphometric Analysis of Soft Palate: Comparison of Need's ratio with Palatal Variants and Gender using Digital Lateral Cephalogram in Normal Individuals

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The soft palate or velum plays a crucial role in speech, swallowing, and airway function. Inadequate closure of the velum against the pharyngeal wall results in velopharyngeal insufficiency and can potentially predispose the individuals to clinical conditions such as obstructive sleep apnea, hypernasal speech or swallowing difficulties. Need's ratio defined as the ratio of pharyngeal depth to velar length provides cephalometric indicator of velopharyngeal adequacy. This study was aimed to evaluate the morphology and dimensions of soft palate and to compare Need's ratio across different soft palate types and gender in patients visiting MUCM, using digital lateral cephalograms. A total of 788 cephalometric images were studied, and data were analysed using Chi-square, ANOVA and Independent t-test. The most frequent type of soft palate was Type 1 leaf shape (51%). Gender related variations were also observed. Patients with shorter soft palate showed higher Need's ratio ($p < 0.001$) and may pose an increased risk of velopharyngeal insufficiency (VPI). Knowledge of these findings may provide insight into the etiological basis of obstructive sleep apnoea and hypernasality of speech which are possible consequences of velopharyngeal insufficiency, thereby enhancing understanding of anatomical variations and supporting clinical decision making.

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