

Prevalence of anterior loop of the mandibular canal using CBCT: A cross sectional study in Gujarati Population

Dr Takshil Shah^{1*}, Dr Darshana Shah², Dr Anam Saiyed³

1. PhD Scholar, Dept. of Prosthodontics, Gujarat University, Ahmedabad.

2. PhD Guide, Dept. of Prosthodontics, Gujarat University, Ahmedabad.

3. Dept. of Prosthodontics, Goenka Research Institute of Dental Science, Gujarat University.

*Corresponding Author: Dr Takshil Shah, PhD Scholar, Dept. of Prosthodontics, Gujarat University, Ahmedabad. Email: shahtakshil1991@gmail.com.

Abstract:

Background & Purpose: Anterior loop of the mental nerve is a crucial anatomic feature for anterior mandibular osteotomies and implant placement. In most cases, two-dimensional imaging techniques are insufficient to identify and quantify the mental nerve loop. Any damage to this loop causes paresthesia, numbness, or pain in the area that the mental nerve supplies. Cone beam computed tomography (CBCT) will be used in this study to examine its prevalence. The prevalence will be computed, allowing for the safe placement of implants or osteotomy cuts in the premolar region.

Material & Methods: Using CBCT scans of 200 patients undergoing impaction surgery, a cross-sectional research was conducted.

Results: The anterior loop in the mental nerve was present in 98.00% of the individuals in our study.

Conclusion: In most situations where the mental nerve loop bundle is present, it is safe to leave a margin of 4 mm anterior to the mental foramen to prevent harm to the loop.

KEYWORDS: CBCT, implant placement, mental nerve, mental nerve loop, nerve injury, paresthesia

Introduction:

The mental nerve, which supplies somatic afferent fibers to the gingiva anterior to the premolars, lower lip, and chin, is a branch of the inferior alveolar nerve. The inferior alveolar nerve can occasionally travel beneath the mental foramen's lower border. It continues as the mental nerve after spiking the incisive branch, curves superiorly, turns posteriorly, and enters the mental foramen.

The term "mental nerve loop" refers to the portion of the inferior alveolar nerve that runs anterior and inferior to the mental foramen as a result of this altered path.

When placing implants and performing osteotomy surgeries, it is crucial to take the mental nerve loop into account as an anatomical component. Preventing damage to the nerve loop will shield against any irreversible or reversible nerve damage brought on by an artificial source. Cone beam computed tomography (CBCT) will be used in this study to measure the length and prevalence of the anterior loop of the mental nerve in the Indian population. The goal is to determine the average safe margin length that should be maintained during procedures in the mental nerve loop region.

Material and Methods:

The CBCT images of 200 patients who had impaction surgery from year 2019 to 2023 were used in a cross-sectional study. All of the study's participants gave their informed consent after learning about the investigation's goal.

There were 400 mandibular quadrants examined in all. Since all of the patients were young adults between the ages of 20 and 35, neither their age nor gender was taken into account. Patients with systematic diseases, improper CBCT, and undergoing orthodontic treatment were excluded from the study.

Results:

Based on descriptive analysis, 196 individuals (98.00%) out of the 200 showed anterior mental nerve looping. Out of the patients, 195 had the loop on both sides, meaning that 97.5% of them had it bilaterally and 98% solely on one side.(Table 1&2).

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	4	2.0	2.0	2.0
YES	196	98.0	98.0	100.0
Total	200	100.0	100.0	

Table: 1 Presence of Loop on left side

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5	2.5	2.5	2.5
YES	195	97.5	97.5	100.0
Total	200	100.0	100.0	

Table: 2 Presence of Loop on right side

Discussion:

The majority of surgeons use panoramic radiography as their go-to diagnostic method for osteotomies and implant placement. However, the image is prone to distortions and changes, and it does not provide precise details regarding the presence or absence of mental foramen.¹

Comparing computed tomographic (CT) pictures with panoramic radiographs reveals that CT scans are more sensitive in detecting mental nerve loops, regardless of the quality of the bone.²

In the broad range of its prevalence percentage ranging from 7% to 94%, mental nerve loop is present in 98% of our research sample, which matches roughly with 94% as studied by Jacobs et al^{3,4}.

Conclusion:

Prevalence of anterior loop was found in 98.0%. Findings of the study state that in most circumstances it is safe to leave a margin of 4 mm anterior to the mental foramen in order to prevent any unintentional harm to the mental nerve loop bundle.

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ORCID:

Dr Takshil Shah MDS <http://orcid.org/0000-0003-0680-7545>.

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