**Anterior Loop of the Mental Nerve and Its Radiologic Imaging: a Review**

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**Abstract**

The mental foramen region is important for dental practise. When inferior alveolar nerve arises from the mandibular canal, it runs out ward, upward and backward to open at the mental foramen then it was called as "anterior loop of mental nerve". The correct visualization of anterior loop has an important role for planning of implant placement in preventing complications like paresthesia and bleeding. Reliability and precision of the images obtained with two-dimension conventional methods like periapical or panoramic radiography are limited when tracing the anterior loop. Cone beam computed tomography (CBCT) is a succesful method that provides three-dimensional imaging with low ionized radiation to image the anterior loop. In this article anterior loop of the mental nerve and its imaging will be discussed with literature information.

**Keywords:** Mental foramen, anterior loop, implant, paresthesia

**Introduction**

The mental nerve is a terminal branch of the inferior alveolar nerve (1). This nerve generally emerges from the mental foramen (MF) in three branches. The first branch gets the sensory impulses from the skin of the mental region, while the other branches get the sensory impulses from the lip skin, mucous membranes and gingival up to the second premolars (2,3). The inferior alveolar nerve can extend beyond MF like an intraosseous anterior loop (AL) (4). The intraosseous loop with a course of upwards, outwards and backwards of the inferior alveolar nerve originating from the mandibular canal to go out from the MF is called the "anterior loop of the mental nerve" (4,5,6) (Figures 1,2).

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**Figure 1:** The left mental foramen (black arrow) on the panoramic radiograph; the anterior loop of the mental nerve within the intraosseous canal (thick white arrow) extending to the anterior of the mental foramen and the incisive canal (white arrow).

**Figure 2:** Observation of the mental canal (white arrow) and the mandibular canal (black arrow) as two separate canals along the anterior loop of the right mandible on the cross-sections in cone beam computed tomography.
Importance of the Anterior Loop

Some neurosensory impairments including pain, paresthesia, and discomfort can develop related to the injury of the AL after implant application in the interforaminal area (7,8).

Taking the location of the MF and the AL of the mental nerve that can be at the mesial of the MF into consideration before the implant surgery is greatly important to prevent a potential mental nerve injury (9).

Presence of the Anterior Loop and Radiological Imaging

Presence of AL has been shown with anatomic on cadavers (10,11) and radiologic images (12,13,14) in several studies.

Solar et al. (10) reported that ALs with a mean length of 1 mm, ranging between 0.5 to 5 mm with a rate of 60% in their study on 37 cadaver mandibles. Neiva et al. (11) showed ALs with a mean length of 4.13 mm, ranging between 1 to 11 mm with a rate of 88% on 22 cadavers. Rosenquist found ALs with a mean length of 0.15 mm ranging between 0 and 1 mm with a rate of 26% (15 of 58) on mandible cadavers. AL was 0.5 mm long in 13 cadavers, and two cadavers had a 1 mm AL (15).

AL was detected by 7% in the study of Jacobs et al. carried out on 230 spiral computed tomography (CT) images taken before the implant planning (16). Li et al. found ALs with a rate of 83.1% and mean length of 2.09 mm (range: 0.5-3.21 mm) in their study of spiral CT sections of 68 Chinese patients (12). Apostolakis et al. found ALs with a rate of 48% and mean length of 0.89 mm (range: 0-3.7 mm) in their study on 93 patients with cone-beam computed tomography (CBCT) images (17). Luet al. the AL was identified in 85.2% of cases and the mean length of 1.46 mm on 732 hemimandibles with use CBCT scans (18). Ngeow et al. reported ALs on 66 sides (34.4%), their study performed on 97 panoramic radiographs. One or more ALs were visualized in 39 (40.2%) radiographs. ALs were most commonly seen bilaterally, followed by one on the right side. They reported that visualization of AL decreased with age, and that there was no relation between gender and visualization (19).

False positive or false negative responses can be obtained for the ALs determined with periapical or panoramic radiographs as compared to the anatomic studies (4,5,20).

Arzouman et al. found significantly fewer loops as compared to the anatomic studies (4,5,20).

References


