

How Far Or How Close Is It? Lingual Vascular Canal

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Abstract

Research question

What is the distance of the lingual vascular canal from the crestal bone, the labial bone and the deviations, if present, from the midline ?

Aim

To assess the variations in the dimensions from the crestal and the cortical bone to a lesser known lingual vascular canal in the anterior mandible region.

Objective

To evaluate the distance of the lingual vascular canal from the crestal bone, the labial bone and the deviations from the midline for implant planning.

Materials And Methods

Total sample of 55 CBCT scans were collected out of which 10 showed lingual vascular canal with anterior teeth missing and were subjected to radiological evaluation. The anatomical position of lingual vascular canal to the crestal bone and labial cortical bone along

with deviations from the midline were assessed in the cross sectional view. The mean value of the results were obtained and tabulated.

Results

The average distance from crestal bone was found to be 14.05 mm and the average distance from labial bone was found to be 5.7mm. The average deviation from the midline was found to be 2 mm towards either the left or the right side.

Keywords

Lingual vascular canal, crestal bone, labial bone, midline deviation

Introduction

The anterior region of the mandible is one of the common regions subjected to surgical procedure. Due to it being a part of the aesthetic zone, care must be taken to given to deliver the most appropriate form of treatment. Dental implants are a new and fast upcoming mode of comprehensive treatment plan for rehabilitation

for edentulous patient. A thorough assessment, which includes radiographic evaluation and systemic evaluation, is a compulsory prerequisite for treatment planning.

There are several radiographic methods used for treatment planning. However the use of Cone beam computed tomography is the most preferred and accurate till date[1]. The CBCT helps in visualizing the anatomical regions on a three dimensional plane. It shows a detailed assessment of all the bony structures.

Materials and Methods

55 CBCT scans were collected from saveetha dental college in Chennai, India and a retrospective analysis was done. Permission for the collection was scans were acquired from the department of Oral medicine and Radiology. Scans of patients with lower anterior teeth missing were selected for this study, which included recently extracted as well as completely edentulous patients.

Inclusion Criteria

1. Completely Edentulous or partially edentulous patients of Indian ethnicity between ages of 20 and 60 years.
2. Healthy and medically compromised patients were included.

Exclusion Criteria

1. Patients with any history or trauma or mandibular pathologies
2. Patients of non- Indian ethnicity

Results

The study included 5 male and 5 female patients. The lingual vascular canal was found in the axial images of the scan.

The average distance from the crestal bone was found to be 14.05 mm and the distance from the labial bone was found to be 5.7 mm.

Discussion

The mandibular anterior region is greatly used for several procedures such as oral implants for edentulous arches or even as a viable donor site for several procedures. Thus, it is necessary to understand the anatomy of the neurovascular bundle in that region for a holistic treatment approach [3]. The extent of the neurovascular bundles present implies a higher potential risk during surgical procedures. With an increase in complications associated with trauma to vascular canal, this study was undertaken to identify the positions of canal from the surrounding bone to help prevent such complications.

The lingual vascular canal is a common structure often undetected in the mandible. Several researchers such as Ennis, Suzuki and Sakai, McDonnell et al., Darriba and Mendonca-Cardad and Givol assumed that the content in the vascular lingual canal is an anastomosis of the sublingual branch of left and right lingual arteries [4,5,6,7,8]. This implies that the size of the artery could be sufficient enough to provoke a hemorrhage intraosseously or in connective tissue which will be hard to control. This view is in contrast to Goaz and White who stated that the canal were termination of the incisal branch of the mandibular canal [9].

CBCT and CT scans are the gold standard for visualisation of the lingual canal as stated by Yoshida et al, who stated the difficulties of radiographic evaluation of the canal [10]. CT is important tool for visualizing accurate anatomical structure and position, bone topography, osseous pathology associated with dental implantology. [11]. Another option for visualization in the MPR of multiple slices reformation. It provides an accurate visualization of midline mandibular structures depicting the size and shape of the lingual vascular canal which correlates to the anatomic literature. [12, 13, 14].

The difference is due to the limited resolution capacity of the CT as compared to a MPR.

Conclusion

With an increase in trend in the placement of dental implants, there is an increase in post operative complications as well. Damage to the lingual vascular canal is one such complication which can lead to hemorrhage and Implant failure. However, with the use of cone beam computed tomography and CT scans, we can visualize the jaw anatomy with great accuracy and thereby reducing any post operative complications which arises due to poor mandibular Anatomy and poor treatment planning.

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