

Assessment of Nasopalatine Canal Bone Grafting and Dental Implant Treatment: Two case reports

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Introduction:

The nasopalatine canal is an important anatomical structure located in the maxillary anterior region. It contains the nasopalatine nerve and artery and is a potential limitation in implant placement. The size of the nasopalatine canal is an important factor to consider when planning implant placement in this region.

The nasopalatine canal is a relatively small structure in the maxillary anterior region. However, its size and position can vary between individuals and should be carefully evaluated during implant planning to avoid any potential complications.

Implant placement in the anterior maxilla can be challenging due to the atrophy of the maxilla and the presence of anatomical structures such as the nasopalatine canal. Ideal implant position may involve a violation of the nasopalatine nerve and canal space.

A study by Lops et al. (2012) reported successful outcomes in ten patients who underwent bone grafting of the nasopalatine canal before implant placement. The study found that the use of autologous bone grafts led to a predictable and stable outcome, with a high implant survival rate³.

Two approaches to this technique have been described in the literature. The first involves removing the contents of the nasopalatine canal and packing the canal with an osseous graft material to provide a stable base for the implant. The second approach involves dislocating the nasopalatine nerve and packing the canal with an osseous graft material to provide support for the implant.

Another study by Watzak et al. (2010) compared the outcomes of implants placed in the nasopalatine canal using the two different techniques described above. The study found similar success rates and complication rates for both techniques, with no significant differences in implant survival or sensory disturbance between the two groups⁵.

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Treatment:

Case 1:

The patient in this case is a 66-year-old male who sought a consultation at the Advanced Care Clinic at Southern Illinois University School of Dental Medicine for a failing tooth number 8. A clinical examination was performed and a CBCT and intra-oral digital scan were obtained.

Surgical Treatment:

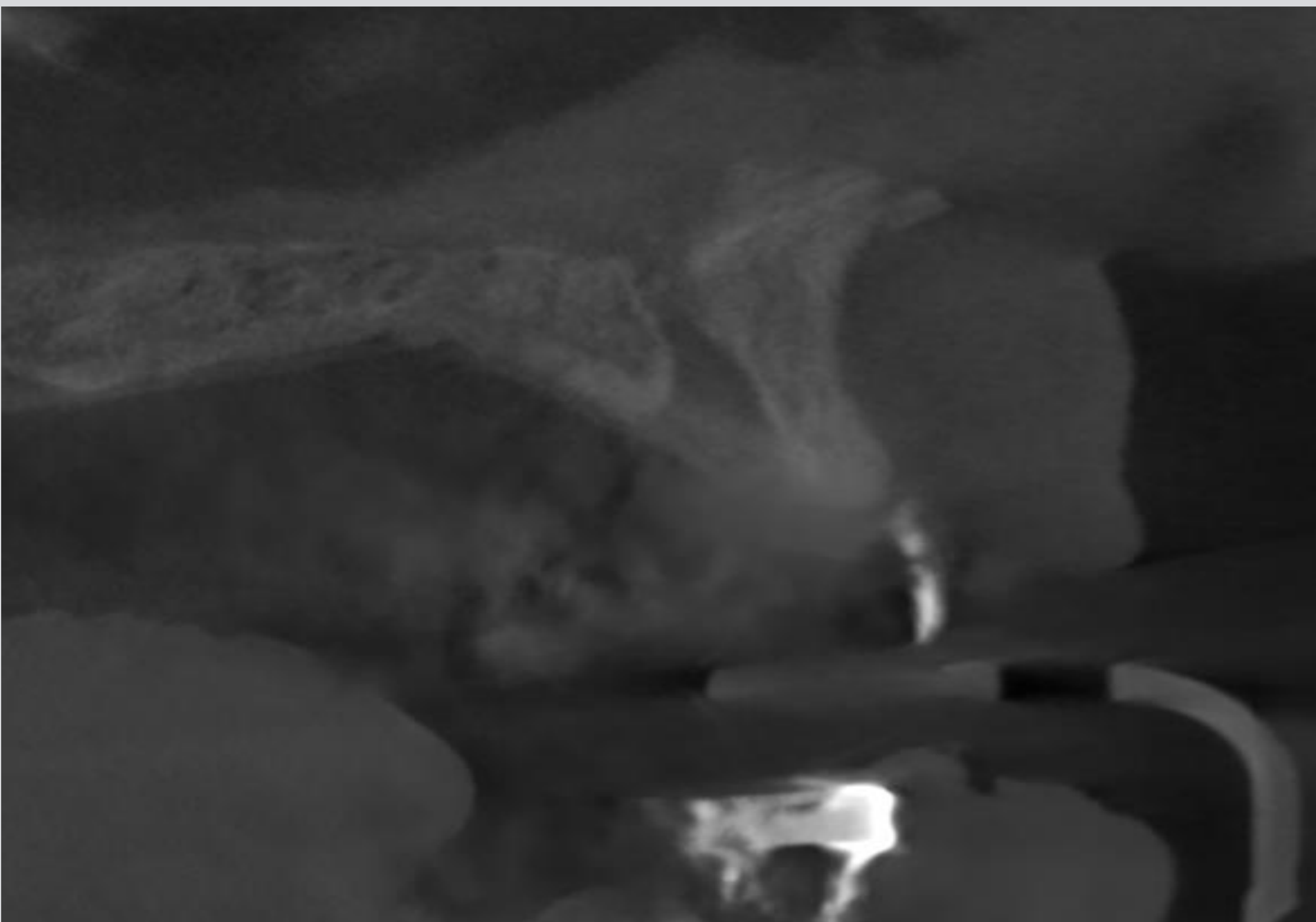
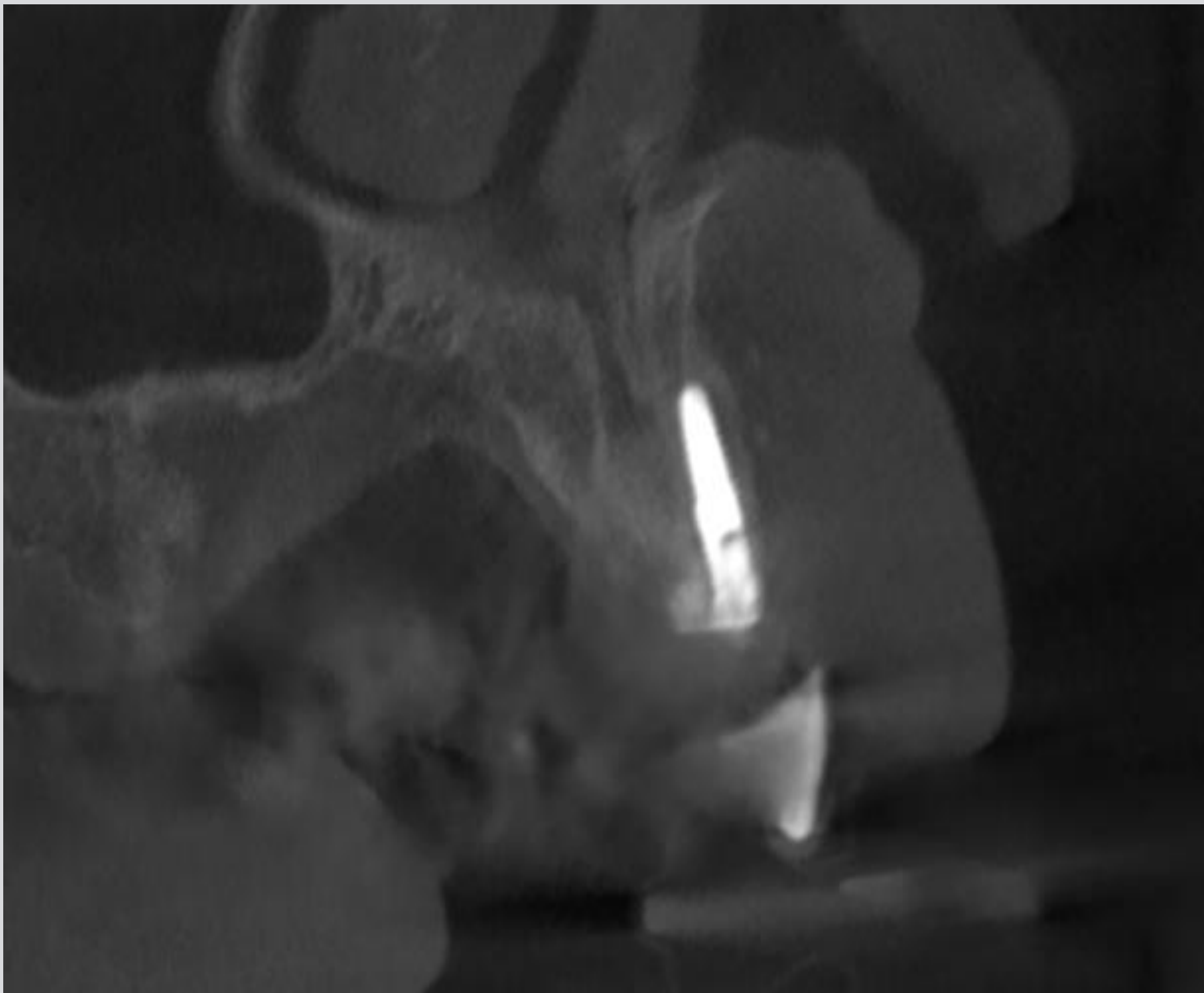
Local anesthesia was administered and a mid-crestal incision was created from the distal of tooth number 5 to the mesial of tooth number 9. The nasopalatine canal was exposed and all soft tissue was removed.

The implant placement process started with the use of a surgical guide to create the initial osteotomy. A verification pin was placed with floss to confirm placement position and direction. A CBCT was taken to verify the anticipated implant length.

The CBCT also confirmed there was a perforation to the nasopalatine canal. Implant site preparation was completed for a Southern Implants 12-degree Co-axis 3.25 x 11.5 mm external hex implant.

The canal was irrigated with sterile saline and a small Colla-plug was placed at the base of the canal. Additionally, 0.25 cc of freeze-dried bone graft was placed in the nasopalatine canal. The implant was then placed and primary stability was achieved above 35 n/cm. Figure. 1.B. A cover screw was placed and primary flap closure was achieved using Vicryl sutures.

Throughout the entire post-surgery period, which included the implant healing phase and the second surgery to uncover the implant, the patient did not experience any clinical complications. The implant remained stable and the patient is now awaiting the final impression, which will be used to create the final crown.



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Treatment:

Case 2:

A 58-year-old female presented to the Advanced Care Clinic at the School of Dental Medicine for an implant consult due to a failing tooth number 8. A clinical examination, CBCT, and intra-oral digital scan were performed.

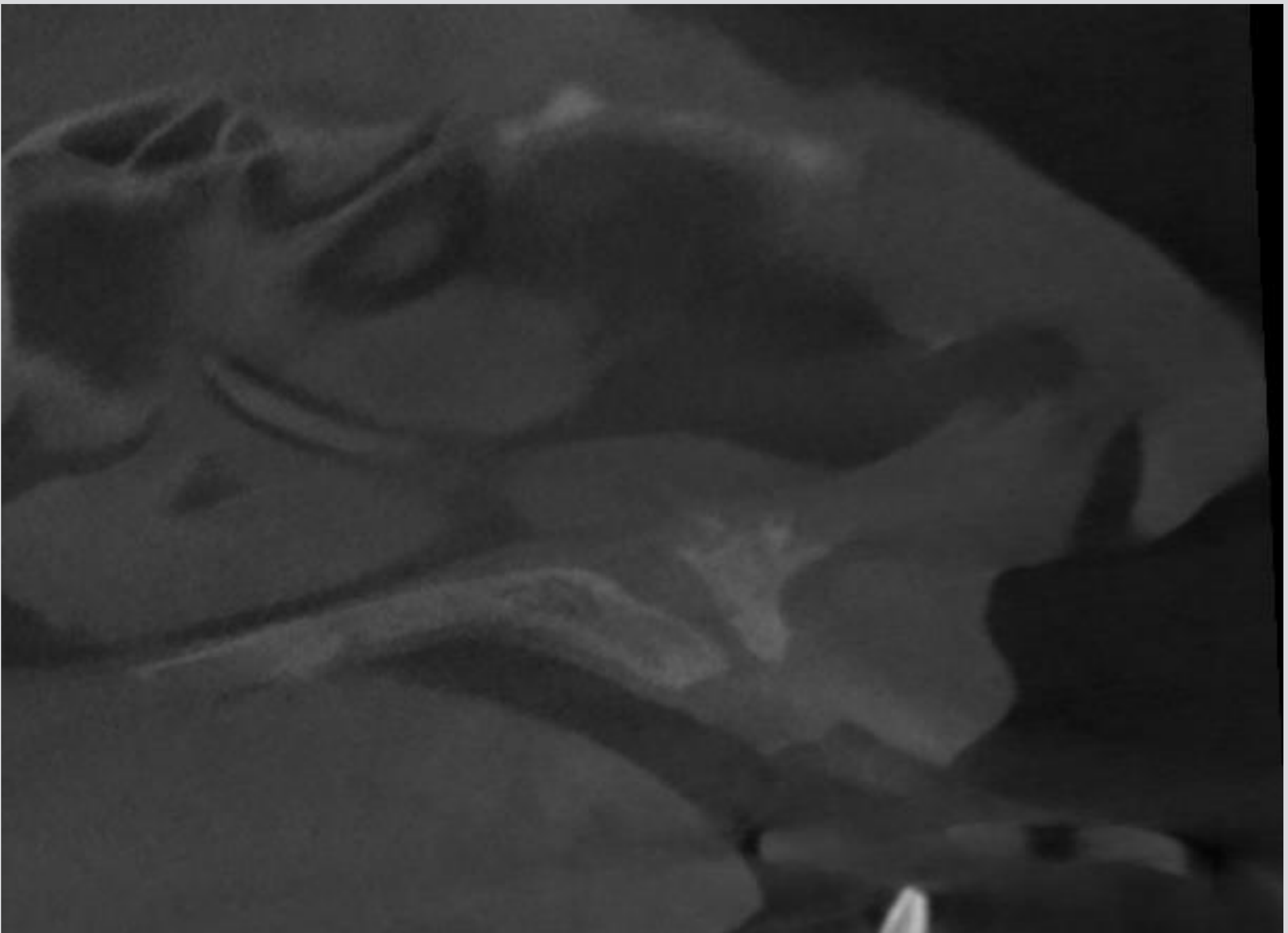
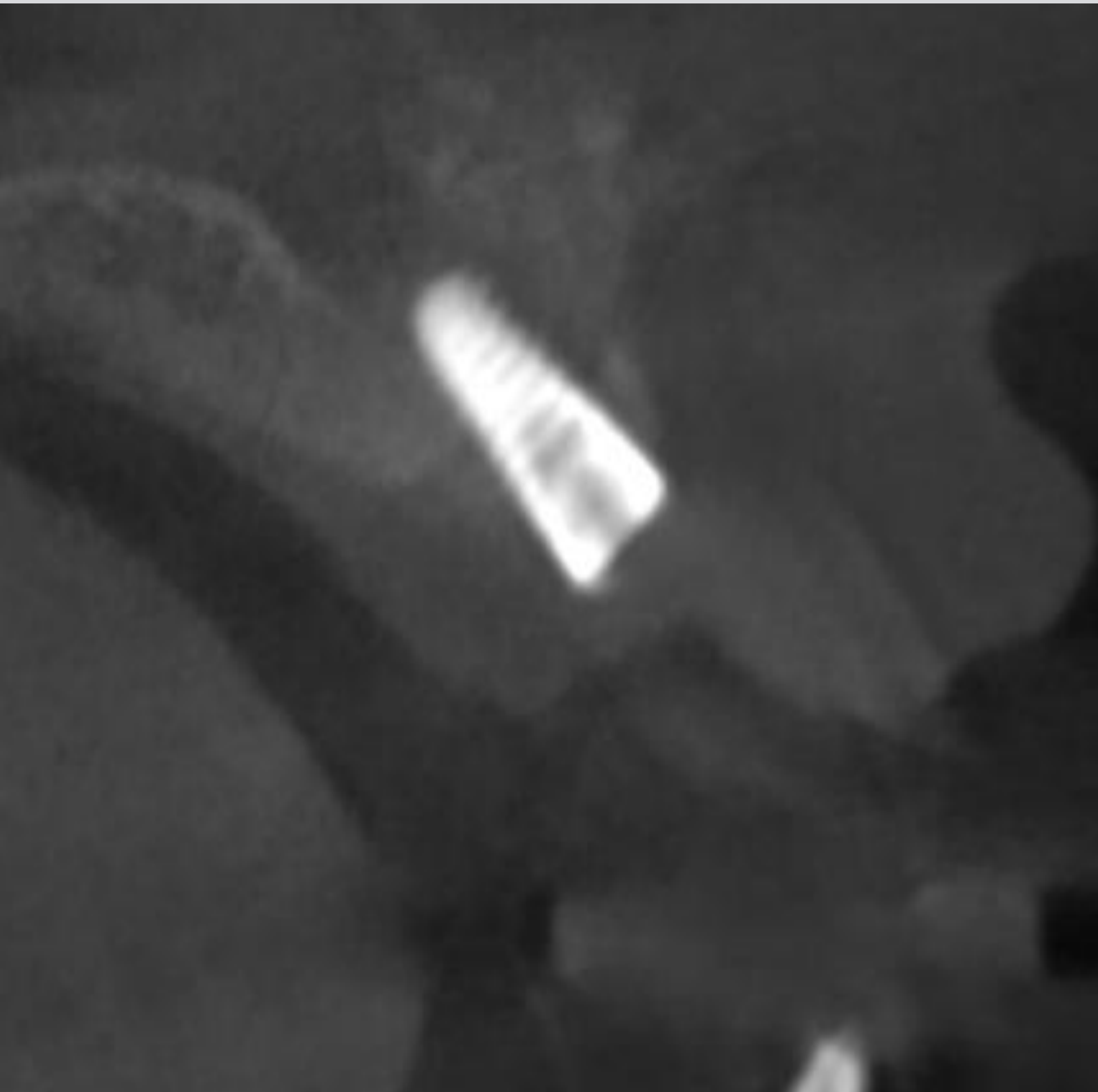
Surgical Treatment:

After local anesthesia was administered, a mid-crestal incision was made from tooth number 7 to tooth number 9 with vertical releasing incisions. After flap elevation, the nasopalatine canal was very close to the planned implant position. A surgical curette was used to remove all soft tissue contents from the nasopalatine canal. Next, the process of bone ring fixation and implant placement was started. The surgical guide was used for the initial osteotomy. A verification pin was placed and a CBCT was taken to confirm position. The CBCT indicated a perforation in the nasopalatine canal.

An osteotomy was then made for the bone-ring graft using the bone ring graft kit and the canal was irrigated. Freeze-dried bone allograft was placed in the nasopalatine canal. The bone ring was then fixed in implant site number 8 and a Straumann 4.1 x 10 mm implant was placed through the bone ring. Primary stability was achieved above 40 N/cm and the implant cover screw was placed. Figure.2. B

The surgical site was covered with a resorbable collagen membrane and primary flap closure was achieved using 3-0 Vicryl suture.

At one week, the patient presented with deep pain and abnormal sensations over the incisive papilla. The patient was prescribed gabapentin at 300mg four times daily for two weeks. Gabapentin is an anticonvulsant medication often used for neuropathic pain. After the two-week course of gabapentin, the patient experienced a remarkable improvement and returned to normal functioning. The pain and paresthesia completely resolved.



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Discussion:

The anterior maxilla presents a unique challenge in dental implant placement due to the presence of the incisive foramen which is a small anatomical structure located in the midline of the palate.

In cases where the incisive canal is present in the ideal anatomical area for implant placement, surgical techniques can be used to utilize the canal as an anchorage region for the implant. Two main techniques have been described in the literature for this purpose.

The management of the nasopalatine canal during dental procedures has been a topic of debate among clinicians. Some authors advocate for nerve repositioning or removal, while others suggest emptying the contents of the canal and grafting without causing significant nerve injury. Various techniques have been documented to achieve successful grafting of the nasopalatine canal

Conclusion:

implant placement in the nasopalatine canal region can be a valuable option for patients who require implant-supported rehabilitation. Further research and clinical experience may help to refine the technique and improve its predictability and safety.