

TECHNIQUE OF DENTAL IMPLANT REMOVAL USING A BONE TREPHINE: INDICATIONS, TECHNIQUE, AND POSSIBLE COMPLICATIONS

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Abstract:

Implants are an effective way to restore missing teeth; however, in some cases, implant removal may become necessary. One of the methods used for implant removal is the use of a bone trephine. This method is typically applied in situations where traditional extraction methods do not yield the desired result. This article provides a detailed review of the indications for implant removal, the technique of the procedure using a trephine, possible complications, and ways to prevent them.

Keywords: implant removal, bone trephine, peri-implant infection, osseointegration, surgical access, implant extraction, implant removal technique, complications after implant removal, bone grafting, recovery after implant removal

1. Indications for Implant Removal The need to remove an implant may arise for several reasons, including the following:

Peri-implant infection. One of the most common reasons for implant removal is infection in the peri-implant tissues, which can lead to bone loss and implant failure.

Incorrect implant positioning. The implant may be placed with positioning errors, leading to unsatisfactory aesthetic and functional results.

Failed osseointegration. In rare cases, the implant may not integrate with the bone, making it unstable.

Mechanical implant damage. There are situations where the implant becomes fractured or deformed, especially when using older designs.

Periodontal diseases. In cases of severe periodontitis, despite a well-placed implant, it may need to be removed due to significant bone resorption.

2. Technique for Implant Removal Using a Trephine

The use of a bone trephine for implant removal is generally applied when other methods are ineffective. This could be due to the implant's tight attachment to the bone or the need to minimize tissue trauma. The procedure involves several steps:

Patient preparation and anesthesia. Before the procedure, it is crucial to conduct a thorough diagnosis, including radiographs or CT scans, to precisely assess the implant's position and surrounding structures.

Local anesthesia or sedation may be used depending on the complexity of the surgery and the patient's condition.

Surgical access. After administering anesthesia, an incision is made in the mucosa over the implant, exposing the bone. A linear or semi-lunar incision is commonly used.

The occlusion of the bone tissue at the implant site is evaluated both visually and by palpation.

Application of the bone trephine. The bone trephine is a specialized tool that consists of a cylindrical bur with sharp edges. Its task is to drill through the bone around the implant for subsequent removal.

The trephine is placed around the implant, and with careful rotational movements, a section of bone surrounding the implant is drilled away. This process must be precise to avoid damage to critical anatomical structures, such as nerve canals or adjacent teeth.

Implant extraction. Once sufficient bone has been removed, the implant becomes mobile and can be extracted using a special extractor or forceps.

Care must be taken to avoid damaging or deforming the implant, as this can complicate the procedure.

Evaluation and treatment of the extraction socket. After the implant is removed, the condition of the remaining bone tissue must be assessed. If there are signs of infection or inflammation, the socket is thoroughly sanitized with antiseptics.

Suturing the surgical site. After treating the socket, the wound is sutured. The type of suture used may be absorbable or non-absorbable, depending on the specific situation.

3. Postoperative Recovery

After implant removal using a trephine, the healing process requires careful monitoring by the surgeon and strict adherence to postoperative instructions by the patient.

Care instructions. The patient is prescribed antiseptic agents for oral care and analgesics to reduce pain.

Antibiotic therapy. Antibiotics may be prescribed in the presence of infection or inflammation to prevent further complications.

Diet. A soft diet is recommended during the initial recovery period, avoiding hard and spicy foods.

The healing time depends on the extent of the procedure, the patient's overall health, and adherence to postoperative instructions. On average, rehabilitation takes several weeks to several months.

4. Possible Complications

Like any surgical procedure, implant removal using a trephine can be associated with several complications. The most common include:



Damage to surrounding tissues. Incorrect technique may lead to damage to nerve fibers or adjacent teeth.

Infectious complications. If the socket is not properly treated, or the patient does not follow hygiene rules, osteomyelitis or other infections may develop.

Bleeding. Poor surgical technique can lead to significant bleeding, particularly if large blood vessels are affected.

Recurrence of infection. If the surgical site is not adequately debrided, recurrent infection may occur, requiring further surgery.

Bone resorption. In some cases, particularly when removing large implants, significant bone loss can occur, requiring additional bone grafting.

5. Prevention of Complications

To minimize the risk of complications during implant removal using a trephine, the following guidelines should be followed:

Thorough planning. A detailed preoperative assessment, including radiographic imaging and CT scans, is essential for accurately determining the implant's position and the surrounding structures.

Surgeon experience. The procedure should be performed by a qualified specialist with experience in this type of surgery.

Antibiotic prophylaxis. Antibiotics may be prescribed in some cases to prevent infection, particularly if inflammatory processes are present in the peri-implant tissues.

Conclusion

Removal of dental implants using a bone trephine is a complex but effective procedure that minimizes tissue trauma and prevents severe complications. The key



factors for successful outcomes are careful planning, the surgeon's expertise, and the patient's adherence to all postoperative recommendations.

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