



# Removal of Failed Implants: A Literature Review and Guideline of Explantation Techniques

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## INTRODUCTION

Over time, the percentage of dental implants that fail is increasing. Clinicians must understand that an implant removal is different from a tooth removal and therefore they must be knowledgeable in different procedures regarding the removal of dental implants. They must also consider clinical and anatomical factors as well as the patient's desire of reimplantation in failed implant site.

## METHODS & MATERIAL

A literature review has been performed using the PubMed and Google Scholar electronic databases. 7 articles qualified and have been selected for this study.

## Factors for Decision Making

### Clinical

1. Type of Implant/abutment connection
2. Implant diameter
3. Remaining level of osseointegration, mobility of implant
4. Presence of peri-implant inflammation/ infection
5. Timing of future implant placement

### Anatomical

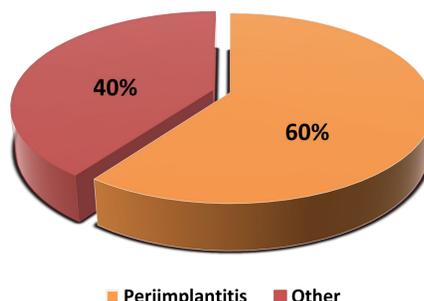
1. Bone density
2. Vital anatomical structures (max. sinus, IAN)
3. Width of cortical plates (buccal/ lingual)
4. Distance from adjacent teeth or implants

### PLANNED IMPLANT REMOVAL

STABILITY	BONE QUALITY	OSSEOINTEGRATION	EXPLANATION PROCEDURE	INVASIVENESS
MOBILE	NA		ATRAUMATIC REMOVAL With Forcep or Unwinding	↓ Less Invasive Procedures
NON MOBILE		≥4mm ≤4mm	-CTRT, Osteotomy, Trephines & Piezosurgery -CTRT & Reverse Screw	

## RESULTS

### Reasons for Implant Removal



### Implant Removal Techniques

#### Non-Bone removal technique

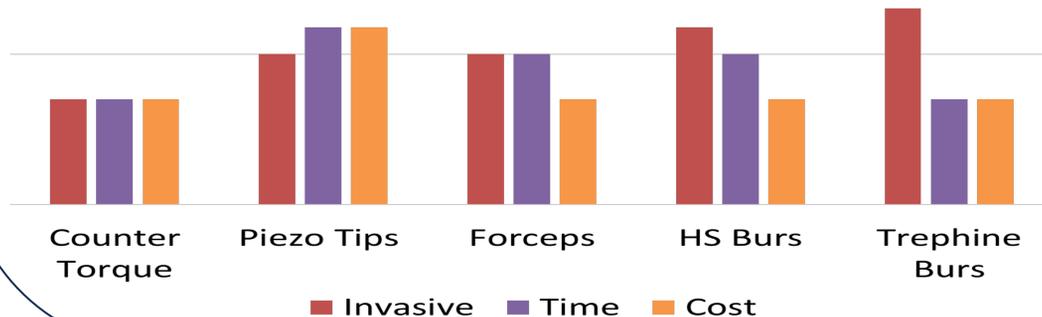
- Counter-torque
- Reverse Screw

#### Bone removal technique

- Trepine Drills
- High Speed Burs
- Piezo Surgery
- Scalpel and Forceps
- Laser

#### Combination of Techniques

## Comparison of Different Methods for Implant Removal



## Non-Bone Removal Techniques

### Counter Torque



- Malpositioned implant
- Thin biotype of tissue
- Aesthetic area
- Buccal and Lingual plate <2mm

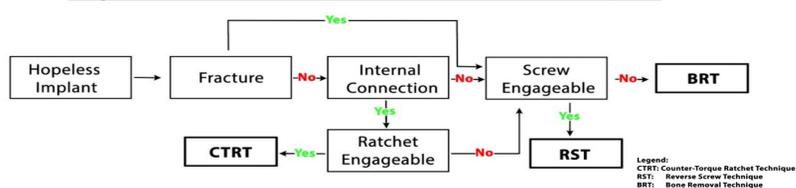
No mucoperiosteal flap elevation required

### Reverse Screw Implant retrieval tool



- Indications:
- Damaged external connection
  - Fractured Implant

### Algorithm For Non Bone Removal Techniques



## Bone Removal Techniques

### Trepine Bur



Mucoperiosteal flap elevation is required

- Disadvantages:
- Adjacent structures may preclude the use of a trephine bur
  - Significant loss of bone
  - Results in bone defects that require guided bone regeneration
  - Often prevents placement of immediate implants

### High Speed Burs



Implant fully integrated apically

### Surgical Instruments



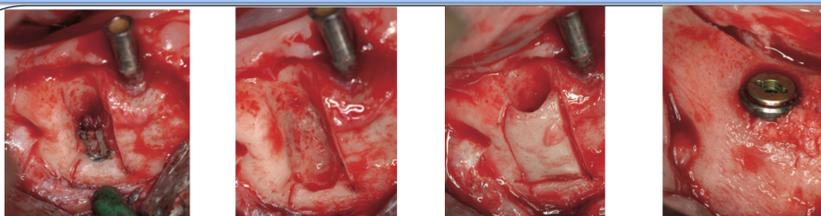
Cortical bone plate (buccal and lingual) >2 mm

### Delivery of Implant



5 wall defect: Failed Implant Site is suitable for reimplantation.

## Bony Lid/ Combination Technique



### Technique:

1. Removal of cortical bone lid by using a micro saw or piezo unit
2. Non-surgical removal of failed implant through window
3. Replanting the bone lid, immediate implant and GBR

### Advantages over the traditional methods for implant removal:

1. Reduces the loss of existing bone and minimizes the bony defect
2. Preserves the contour of the explantation socket
3. Allows the placement of immediate implants and GBR
4. Decreases the overall treatment time and improves outcomes
5. Combination with other non - surgical techniques is possible

## CONCLUSION

Implant removal should always be performed in an atraumatic, tissue preserving and time saving manner. According to our literature review, the use of counter torque technique appears to be the most elegant and least invasive technique for removing an implant with highest predictability of reinsertion of another implant, but a combination of different techniques might be necessary in other clinical situations.

The bony lid technique has many advantages over the traditional surgical methods for implant explantation since it allows immediate implant placement and thereby reduces the overall treatment time.

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