

Stage 2 | Surgical procedures

# Step 1 Implant surgery

# Surgical procedures

Step 1 | Implant surgery

Overview

## Assessment and treatment planning



Step 1 | Patient's expectations,  
history and examination



Step 2 | Treatment planning



Step 3 | Consultation and consent



Step 4 | Fabrication of the surgical drill template

## Surgical procedures



Step 1 | Implant surgery



Step 2 | Post-operative review and suture removal

7–10 days

6–8 weeks

## Prosthetic procedures



Step 1 | Impression-taking



Step 2 | Fabrication of the final prosthesis



Step 3 | Insertion of the final prosthesis

2 weeks

## Aftercare and maintenance



Step 1 | Review visit

3–6 months  
(or as necessary)



Step 2 | Maintenance visit



*In clinic with patient*



*Office / Lab work*

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# Surgical procedures

Step 1 | Implant surgery

Introduction



## Introduction

Implant surgery is similar to many other oral surgical procedures. It starts with appropriate preparation for the surgery. Like other oral surgical interventions, working under sterile conditions is mandatory. Implant placement normally requires raising a soft tissue flap, preparing the implant bed by drilling the alveolar bone, placement of the implant and [Healing Cap or Healing Abutment](#) respectively, followed by adequate closure of the wound.

Good preparation of the surgery and instruments under sterile conditions is critical to reduce the risk of infection.











# Surgical procedures

Step 1 | Implant surgery

Learning  
Objectives



## Learning objectives

-  Know how to prepare the patient for surgery by providing appropriate antibiotic prophylaxis, premedication, antiseptic mouth-rinse and adequate local anesthesia at the surgical site.
-  Be familiar with drilling procedures and its general considerations.
-  Know how to assess bone quality, perform an appropriate incision to raise a full-thickness flap and expose the bone.
-  Be able to place the implant in the correct three-dimensional position.
-  Know what to inform the patient about post-operative aftercare, medication and oral hygiene measures.
-  Know what complications can occur intra- or post-operatively and how to handle such situations.

The procedure for implant placement consists of three parts:



**1. Pre-operative  
part**



**2. Intra-operative  
part**



**3. Post-operative  
part**



# Surgical procedures

Step 1 | Implant surgery

Pre-operative  
part



## 1. Pre-operative part

A suitable room for surgical procedures under hygienic conditions is recommended to reduce the risk of infection, although a strictly sterile operatory is not necessary for successful implant osseointegration<sup>1</sup>. The patient should be covered with sterile drapes, and the surgeon and dental assistant should be dressed in sterile attire. The presence of a second non-sterile assistant can be useful during surgery.

All members of the dental team should be working under sterile conditions, but a second non-sterile assistant can help as a runner during the surgery.

### 1.1 Surgical instrument set-up



Example of a surgical tray set-up.

Check all instruments for completeness and function.  
An adequate stock of implants and sterile spare instruments should always be available.



# Surgical procedures

Step 1 | Implant surgery

Pre-operative  
part

## Personal Protective Equipment (PPE) for the dentist and dental assistant



1. Surgical gloves (sterile)
2. Surgical mask
3. Safety goggles
4. Head cover
5. Surgical gown (sterile)

Personal Protective  
Equipment



[Video: Personal Protective Equipment \(PPE\) and sterile gowning](#)



## Other instruments



1. Dental mirror
2. Flap retractor
3. Lip retractors
4. Surgical suction cannula

Other instruments

## General instruments



1. Anesthesia syringe/needle
2. Dental tweezers (diamond)
3. Dental tweezers (regular)
4. Anatomic tweezers (straight)
5. Periodontal probe
6. Dental probe
7. Dental mirror

General instruments



# Surgical procedures

Step 1 | Implant surgery

Pre-operative  
part

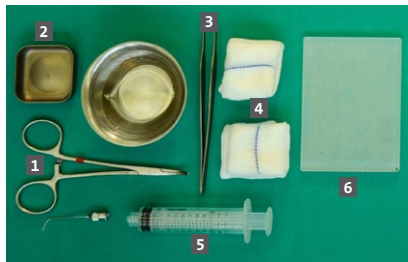
## Flap elevation



1. Surgical scalpels (No. 12 and 15 blades; Microblade)
2. Periosteal elevator
3. Scaler
4. Curettes

Instruments for flap  
elevation

## Additional instruments



1. Clamp
2. Titanium bowl
3. Titanium tweezers
4. Sterile gauzes
5. Irrigation syringe
6. Small glass mixing plate

Additional instruments

## Wound closure



1. Suture material
2. Needle holder
3. Scissors
4. Dental mirror
5. Surgical tweezers

Instruments and suture  
material for wound  
closure



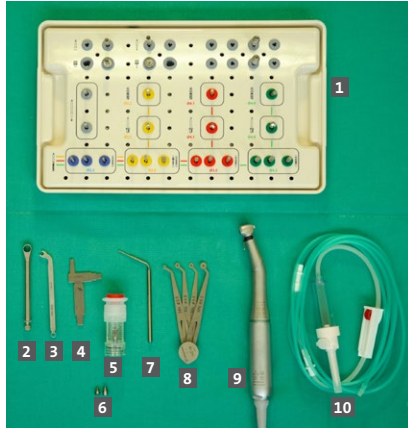


# Surgical procedures

Step 1 | Implant surgery

Pre-operative  
part

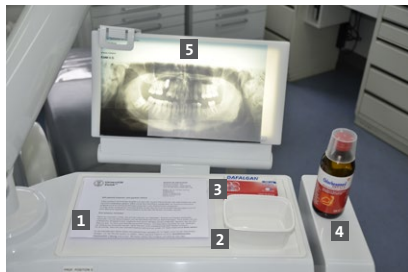
## Drilling and implant insertion



1. Straumann® Basic Surgical Cassette
2. Ratchet
3. Holding Key
4. Diagnostic T
5. Planned implant in sterile container
6. Healing Cap or Healing Abutment
7. Bulb-headed probe
8. Implant Distance Indicator
9. Surgical motor and contra-angled hand-piece
10. Tubing for sterile saline

Instruments for implant  
bed preparation and  
implant placement

## Planning tools/medication



1. Post-operative patient information
2. Surgical drill template in disinfected mouthrinse (chlorhexidine)
3. Pre- and post-operative medication
4. Chlorhexidine mouthrinse
5. OPG or periapical X-ray

Planning tools and  
medication



# Surgical procedures

Step 1 | Implant surgery

Pre-operative  
part



## 1.2 Patient preparation and premedication

- **Antiseptic mouthrinse**

The patient should rinse his or her oral cavity with an antiseptic mouthrinse (chlorhexidine-digluconate 0.12 %) for 1 minute<sup>2</sup>.

- **Analgesics and anti-inflammatory medication**

In order to reduce pain and swelling after the operation, the use of pre-operative analgesics and anti-inflammatory agents is recommended<sup>3</sup>.

- **Antibiotic prophylaxis**

This is not indicated in healthy patients if a straightforward surgical procedure is expected<sup>4</sup>. It may be indicated in high-risk patients (such as those with heart conditions which predispose them to risk of infective endocarditis; or those with prosthetic joints who may be at risk for developing infections at the site of the prosthesis) based on recommendations of national medical societies. It is always best to clarify with the patient's physician on this requirement before the day of the surgery.

**Prepare the patient with the following prophylaxis if necessary:**

- Antiseptic mouthrinse
- Analgesics and/or anti-inflammatories
- Antibiotics



# Surgical procedures

Step 1 | Implant surgery

Intra-operative  
part



## 2. Intra-operative part

The ultimate goal is to perform a minimally traumatic implant surgery with a predictable outcome on the patient. This involves avoidance of any unnecessary tissue damage, as well as minimizing any contamination of the implant site with intraoral or extraoral bacteria.

Goal: Minimally traumatic surgical implant placement.

The following steps are described in this section:

- 2.1 → [Local anesthesia](#)
- 2.2 → [Incision and flap elevation](#)
- 2.3 → [Surgical procedures for Straumann® Standard Plus \(SP\) Implants](#)
- 2.4 → [Surgical procedures for Straumann® Bone Level Tapered \(BLT\) Implants](#)

### 2.1 Local anesthesia



Appropriate local anesthesia is a prerequisite for a safe and painless surgical intervention.

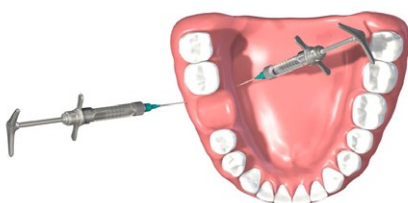
Good local anesthesia provides patient comfort and safety.



#### Maxilla

- Perform a local buccal and palatal infiltration.
- Additionally, a palatal nerve block of the upper posterior maxillary nerve (at the maxillary tuberosity) is required.

Maxilla: Buccal and palatal infiltrations are required. Also consider blocking the upper posterior maxillary nerve if necessary.



#### Mandible

- Perform a local inferior alveolar / lingual nerve block.
- Infiltrate around the long buccal nerve and mental nerve if necessary.

Mandible: Inferior alveolar/ lingual nerve block. Also consider blocking the long buccal nerve & mental nerve if necessary.



# Surgical procedures

Step 1 | Implant surgery

Intra-operative  
part

## 2.2 Incision and flap elevation

### Incision and flap elevation should:

- Be as minimally traumatic as possible.
- Provide adequate visibility and access to the implant bed.

You can use different blades to perform the incisions to gain access to the implant site.



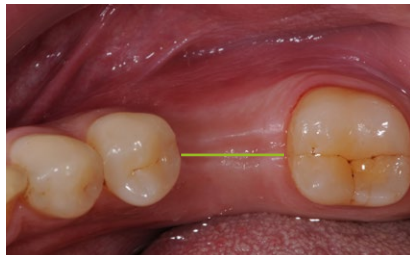
1. Microblade: This is recommended especially in esthetically sensitive areas and thin biotypes. They allow precise incision especially in the sulcular area.
2. Blade No. 12
3. Blade No. 15

Raise a flap with minimal trauma to provide adequate access to the implant site.

Select a suitable blade to perform the incision.

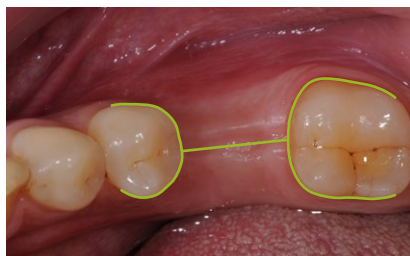
## Step-by-step procedure

### 2.2.1 For a single-tooth gap: Use blades No. 12 and 15



- Make a **mid-crestal** (horizontal) ridge incision extending mesially or distally into the sulcus of the adjacent teeth.

Start with a mid-crestal incision and widen the flap around the sulcus of the adjacent teeth.



- Continue with **sulcular incisions** around both adjacent teeth to the implant bed. On the distal tooth, start the incision from the distobuccal aspect and continue to the distolingual / distopalatal aspect. On the mesial tooth, start from the mesiobuccal aspect and continue to the mesiolingual / mesiopalatal aspect.



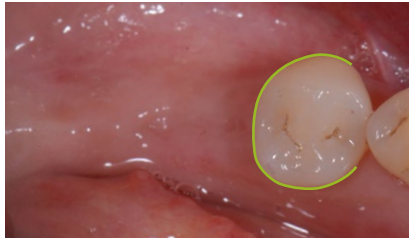


# Surgical procedures

Step 1 | Implant surgery

Intra-operative  
part

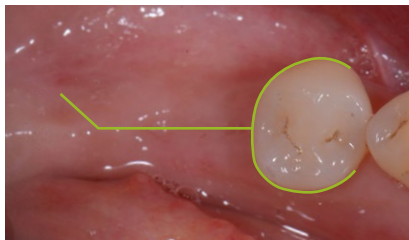
## 2.2.2 For a free-end situation: Use blades No. 12 and 15



- Start with a **sulcular incision** around the mesial tooth from the mesiobuccal aspect to the mesiolingual/mesiopalatal side.



- Continue with a **mid-crestal ridge incision** of about 2 cm distally to the planned implant position. Ideally a band of keratinized mucosa of at least 2 mm should be present buccally and lingually or palatally to the incision.



- A vertical releasing incision may be placed at the distal end of the mid-crestal incision. This incision allows more access to the bony site and facilitates flap closure afterwards.

### Flap in free-end situation:

- Sulcular incision
- Mid-crestal incision extending 2 cm distally to planned implant position
- Vertical releasing incision

**⚠ Caution:** When you make an incision, always use a single incision technique and sharp instruments.



## Surgical procedures

### Step 1 | Implant surgery

### Intra-operative part



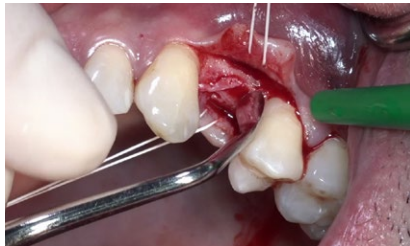
#### 2.2.3 Flap elevation and assessment of bony site

##### → Use the instruments for flap elevation



- A full-thickness mucoperiosteal flap should be raised from the mesial towards the distal aspect, using a periosteal elevator.

Always raise a full thickness mucoperiosteal flap using the periosteal elevator in contact with the bone.



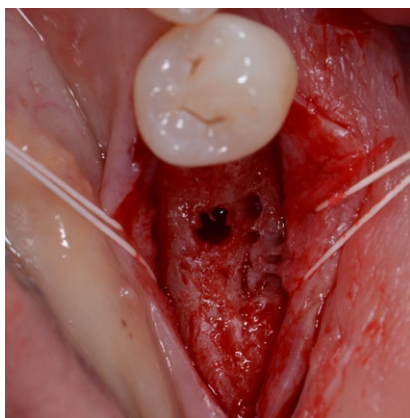
- The entire periosteum is properly released from the bone buccally and in some parts of the palatal or lingual aspect.
- Elevate the flap sufficiently far apically to provide adequate visibility and access to the implant site.

Elevation of the flap should provide good visibility and access to the planned implant site.



- Remove all soft tissue remnants from the bone to have a clean field of view.
- Assess the anatomy of the bony ridge. Check for any bony concavities to avoid perforation during the osteotomy.

Remove all soft tissue remnants and assess the anatomy of the exposed ridge.



In this image shown here, the post-extraction healing process is still ongoing. Soft tissue attachments can be seen. When raising the flap, the periosteal elevator should always be in contact with bone.

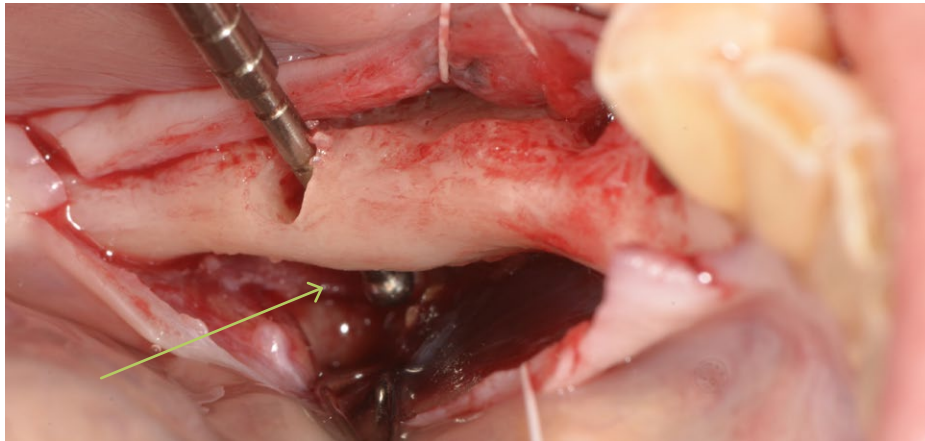
To remove any scar tissue or soft tissue attachments, you may use the curettes or scalers. Sometimes you may need to use the scalpel to cut and lift the initial part of the flap before application of the periosteal elevator. This is often found if the healing process is still ongoing after extraction of the tooth.



# Surgical procedures

Step 1 | Implant surgery

Intra-operative  
part



- ⚠ Caution:** Make sure to identify and protect important anatomical structures such as the inferior alveolar nerve, if it is in the vicinity.
- The base of the flap should not be twisted, stretched or perforated since this may compromise healing.
  - Concavities and lingual undercuts in the ridge can differ in size in patients and in different parts of the jaw.
  - In this image, accidental penetration of the lingual wall of the mandible has occurred.

Protect important  
anatomical structures.

Do not twist, stretch or  
perforate the base of the  
flap.



If you are working with  
Standard Plus (SP)  
Implants, please click here



If you are working with  
Bone Level Tapered (BLT)  
Implants, please click here

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