BEGINNER's GUIDE TO DENTAL IMPLANTS-Patient Education Initiative

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Today, **dental implants** are the state-of-the-art and ideal tooth replacement systems and are now more common than ever before. In the past, implants often failed. However now, the typical life of an implant is about 15 years or longer. Today, about 98% of implants are successful if taken care of properly.

What are dental implants?

Dental implants are metal devices that are surgically inserted into the jawbone in order **to replace one or more missing teeth**. **Dental implants support a dental prosthesis** such as a crown, bridge, removable dentures but sometimes they may act as orthodontic anchors (in order to align and straighten teeth).

Implant-supported bridge

Implant-supported denture

First, a surgical procedure is required to place the dental implant inside the jawbone. The basis for modern dental implants is a biologic process called osseointegration where materials, such as titanium, **form an intimate bond with the bone**. A variable amount of healing time is required for osseointegration (3 to 6 months).

After the healing time, an abutment is attached to the implant. The abutment will hold the dental prosthesis (crown, bridge, removable denture).

ADVANTAGES:

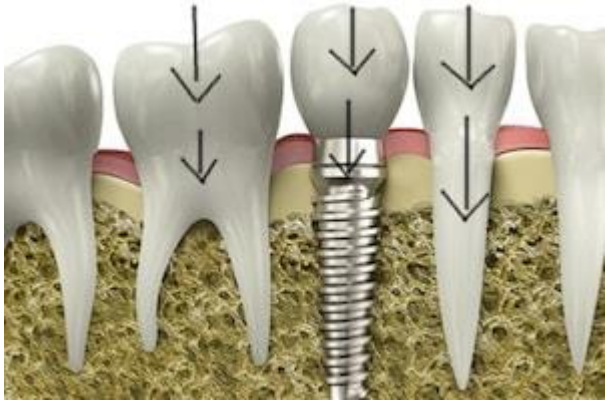
A lot of patients may wonder why they should choose dental implants (which entail a higher cost) over traditional dental restorations supported on natural teeth.

The great advantage of a dental implant is that it replaces the missing tooth **in the most natural way possible**. Dental implants "fuse" with the bone due to the biological process called osseointegration.

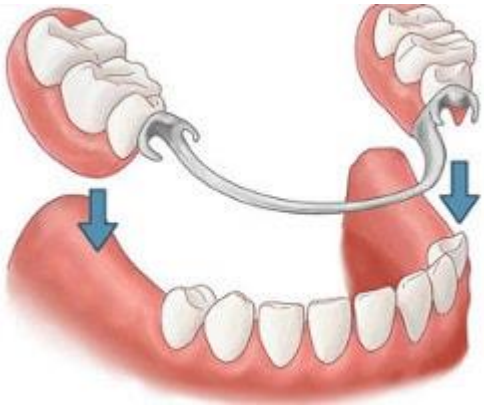
The main objective of any dental restoration is **the proper replacement of the missing teeth**.

Teeth have 3 functions: Chewing, Aesthetics, and Pronunciation. When a dental restoration is designed, one of the main goals is to restore these functions as close as possible to natural teeth.

Let's compare implant restorations to traditional restoration in rehabilitating teeth's main functions:



Chewing forces in case of a dental implant



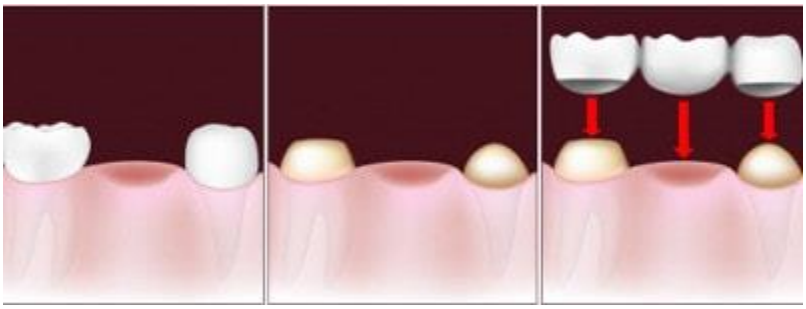
Chewing forces in case of a removable dentures

- **Aesthetics**

- **Phonation or pronunciation**

Other important advantages

Independent tooth support.



Single tooth gap: if a traditional dental bridge is designed, the preparation of the adjacent teeth is required

Single tooth gap: if an implant-supported crown is manufactured, the adjacent teeth remain untouched

- Dental implants preserves bone and significantly **reduces bone resorption** and deterioration that results in loss of jawbone height.
- **Implant supported dentures** may allow chewing the food better and speaking more clearly. Studies have shown that these prostheses contribute to improved chewing efficiency and speaking, **compared to full dentures**.

Implant-supported denture

Full denture

Dental implants drawbacks

If there are no general or local contraindications, dental implants have few drawbacks.

- A surgical procedure for implant placement and a period of healing may sometimes be necessary before the prosthesis may be completed.
- Dental implant procedures may entail an increase in cost compared to conventional dentistry.

Indications

Dental implants can successfully restore **all forms** of partial edentulism (one or several teeth are missing) and complete edentulism (all teeth from a dental arch are missing).

Situations when dental implants are strongly indicated:

- **Single unit toothless gap with healthy adjacent teeth**

  When a single tooth is missing, an implant-supported crown will preserve the adjacent natural teeth by avoiding the need to prepare/cut them. If the toothless gap is restored with a traditional dental bridge, both adjacent teeth will have to be prepared/cut.

  This involves permanently removing parts of the teeth's original structure, including portions that might still be healthy and structurally sound.

Single unit toothless gap

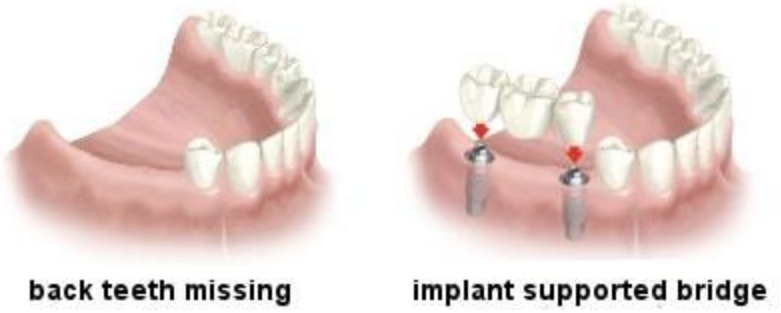
An implant-supported crown is the best treatment option

- **Partial edentulism with the back (posterior) tooth missing**

  These conditions imply the absence of several posterior (back) teeth (molars and/or premolars) on one or both sides of the dental arch (Kennedy class 1 or Kennedy class 2).

  In these cases, traditional dental bridges (supported by natural teeth) are difficult to design because the back support tooth is missing. Removable partial dentures generally require the preparation of several teeth.

  Implant supported prostheses, although entailing a higher cost, are highly indicated in these clinical situations.



- **Complete edentulism**

  When all teeth are missing, the only traditional solution available is a *full removable denture*.

  Implant supported prosthesis (either fixed or removable) allow to chew the food better, speak more clearly and they have a superior stability.

Implant-supported removable denture

Full denture

- **Other situations when dental implants may be indicated**
  - Patients who cannot tolerate a removable restoration (removable denture).
  - Patients with high aesthetic and/or functional demands.

Contraindications

General contraindications

a. Absolute contraindications

Some *serious general conditions* make anaesthesia, surgical procedures and the overall placement inadvisable.

- Heart diseases affecting the valves, recent infarcts, severe cardiac insufficiency, cardiomyopathy
- Active cancer, certain bone diseases (osteomalacia, Paget's disease, brittle bones syndrome, etc.)
- Certain immunological diseases, immunosuppressant treatments, clinical AIDS, awaiting an organ transplant
- Certain mental diseases
- Strongly irradiated jaw bones (radiotherapy treatment)
- Treatments of osteoporosis or some cancers by *bisphosphonates*

b. Relative contraindications

Other situations will be evaluated on a case-by-case basis. Most often, dental implants can only be placed (with the greatest caution) after some preliminary treatments.

- Diabetes (particularly insulin-dependent)
- Angina pectoris (angina)

- Significant consumption of tobacco
- Certain mental diseases
- Certain auto-immunes diseases
- Drug and alcohol dependency
- Pregnancy

Age

- Children: not before the jaw bones have stopped growing (in general 17-18 years).
- On the other hand, advanced age does not pose problems *if the patient's general condition is good*.

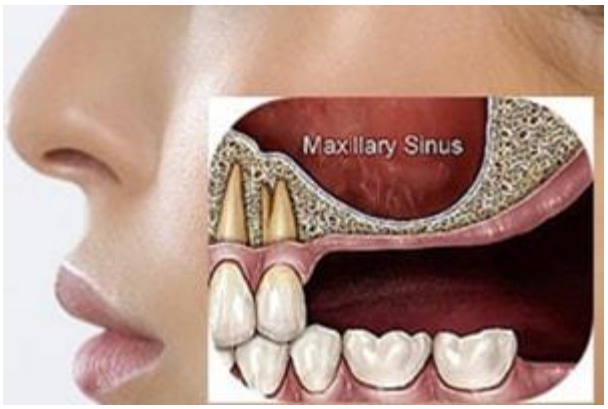
Local contraindications

Some conditions or physiological changes, usually inside the mouth cavity, may temporarily prevent the placement of dental implants. Most of the times, these conditions can be remedied before the implants are inserted in the jawbone.

- There is insufficient bone to support the implants or bone structure is inadequate (due to some chronic infections or other conditions). To ensure a good prognosis, a dental implant **must be completely surrounded by healthy bone tissue**.

A dental implant must be surrounded by healthy bone tissue (with red)

- Important anatomical structures such as the maxillary sinus, the inferior alveolar nerve (located inside the mandible), could have an abnormal position that can interfere with the dental implants.



Lowering of the maxillary sinus

Adjunctive surgical procedures may have to be performed before the placement of dental implants. These procedures aim to increase the amount of bone, so more bone is available to support the implants.

- Some local diseases of the oral mucosa or alveolar bone can temporarily prevent the placement of dental implants until the conditions are treated.
- Hypersensitivity or other allergic reactions; rarely occurs.
- Poor oral hygiene.
- Bruxism or involuntary grinding of the teeth.

What is the structure of a dental implant restoration?

Most often, a dental implant restoration consists of 3 parts:

1. **Dental implant** - A surgical component that interfaces with the bone of the jaw or skull to support a dental prosthesis such as a crown, bridge or removable denture.

   A surgical procedure is required to place the dental implant inside the jawbone. One or more implants may be required for specific cases.

   For example, when a single tooth is missing, a single implant will be positioned. If all teeth from a dental arch are missing, 4 to 8 implants may be required to support the full mouth restoration.

2. **Abutment** - Implant abutments are artificial devices that are connected to the dental implants after the healing process is over.

   The abutments are used to attach a crown, bridge, or removable denture to the implant fixtures.

3. **Prosthetic device** - Dental implants can support a large variety of prosthetic devices: dental crowns, dental bridges and various types of implant-supported removable dentures.

To summarize there are many advantages of dental implants, including:

- **Improved appearance.** Dental implants look and feel like your own teeth. And because they are designed to fuse with bone, they become permanent.
- **Improved speech.** With a poor fit, the dentures can slip within the mouth causing you to mumble or slur your words. Dental implants allow you to speak without the worry that teeth might slip.
- **Improved comfort.** Implants eliminate the discomfort associated with removable dentures.
- **Easier eating.** Sliding dentures can make chewing difficult. Dental implants function like your own teeth, allowing you to eat your favourite foods with confidence and without pain.
- **Improved self-esteem.** Dental implants can give you back your smile and help you feel better about yourself.
- **Improved oral health.** Dental implants doesn't require reducing other teeth, as a tooth-supported bridge does. Because nearby teeth are not altered to support the implant, more of your own teeth are left intact, improving long-term oral health. Individual implants also allow easier access between teeth, improving oral hygiene.
- **Durability.** Implants are durable and will last many years. With good care, many implants can last a lifetime.
- **Convenience.** Removable dentures are just that; removable. Dental implants eliminate the embarrassing inconvenience of removing dentures, as well as the need for messy adhesives to keep them in place.

To conclude…

Success rates of dental implants vary, depending on where in the jaw the implants are placed however, in general, dental implants have a success rate of up to 98%. With proper care, implants can last a lifetime.