

Comprehensive lecture.  
Planning and completing  
dental implants in different  
situations.

Dr. Tatiana Shkolnik, MD.,DMD

# Indications and contraindications of dental implant.

- ❖ Based on more than 30 years experience indications expanded greatly;
- ❖ very few contraindications;
- ❖ new approach in implant planning: implant placement or tooth preservation? for how long the teeth have to be preserved in periodontally damaged bone and soft tissue? at what stage to extract the teeth?
- ❖ Timing of of implant placement .: immediate vs. delayed

# General principles of implant planning.

❖ Backward planning principle. (implant placement is driven by prosthetic objective.)

❖ Treatment sequence:

- pretreatment prophylaxis
- history taking and clinical findings
- assessment of findings (teeth present, jaw relations; soft and hard tissue, existing function and esthetic limitations)
- Definition of the prosthetic objective (primary aim is fixed prosthesis)
- Implantation (if necessary bone augmentation)
- Prosthetic rehabilitation
- Recall

# Clinical considerations

## ❖ Bone quality.

It is a consistency, hence the desired mechanical stability and osseointegration capacity of the bone

## ❖ Factors, influencing bone quality:

inorganic matrix

cellular factors: - osteoblasts

- mesenchymal progenitor cells
- platelets
- granulation tissue and inflammatory cells
- BMP
- osteoclasts (RANK-RANKL, modulators of bone metabolism)

# Misch Bone Quality Classification

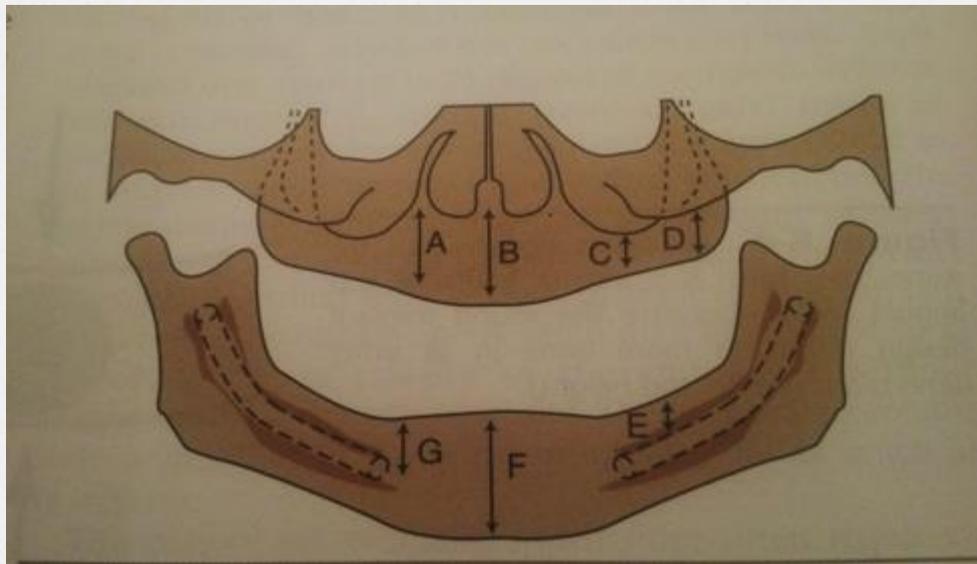
Bone Density	Description	Typical anatomical location
D1	Dense cortical	Anterior mandible
D2	Porous cortical and coarse trabecular	Anterior mandible Posterior mandible Anterior maxilla
D3	Porous cortical (thin) and fine trabecular	Posterior mandible Anterior maxilla Posterior maxilla
D4	Fine trabecular	Posterior maxilla

# Bone quantity

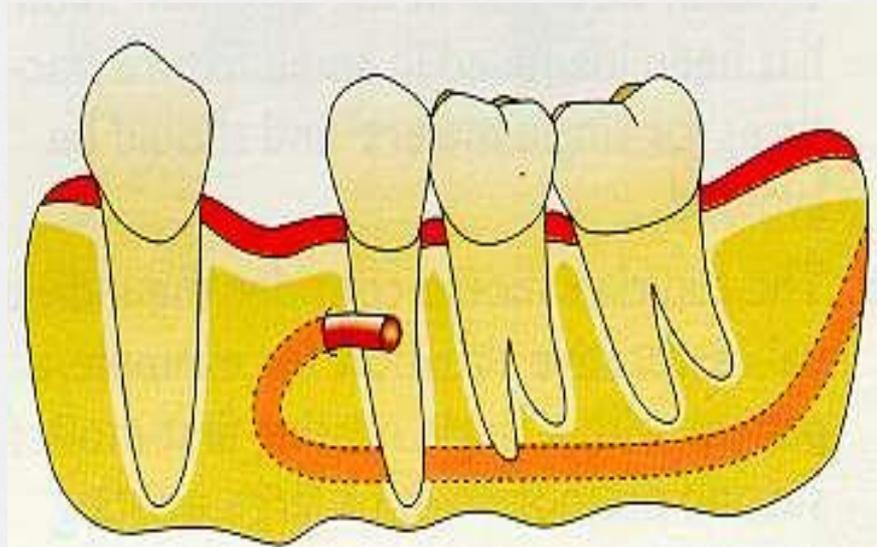
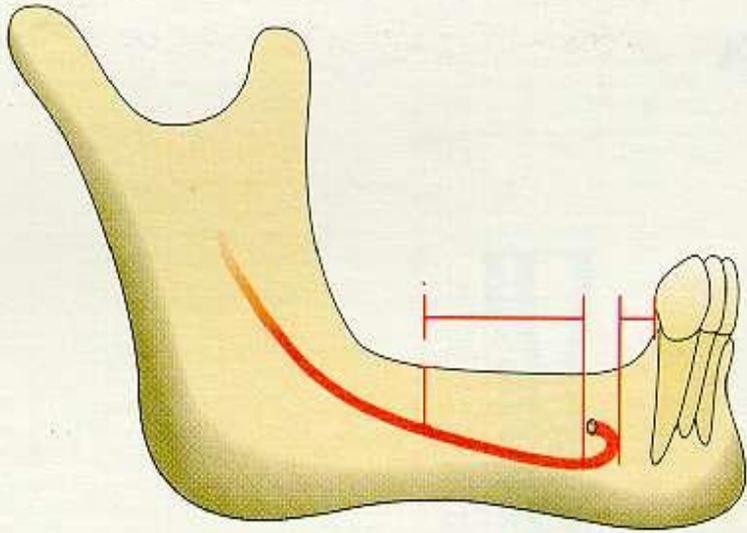
- ❖ Bone height
- ❖ Bone width
- ❖ Bone length
- ❖ Bone angulation

# Bone height

- ❖ Minimum height requirements is partly related to the density of the bone
- ❖ The height is measured from the crest to the opposing landmark

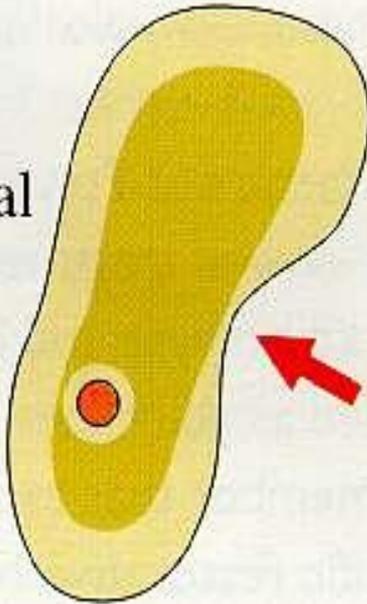


## Anatomical dangers

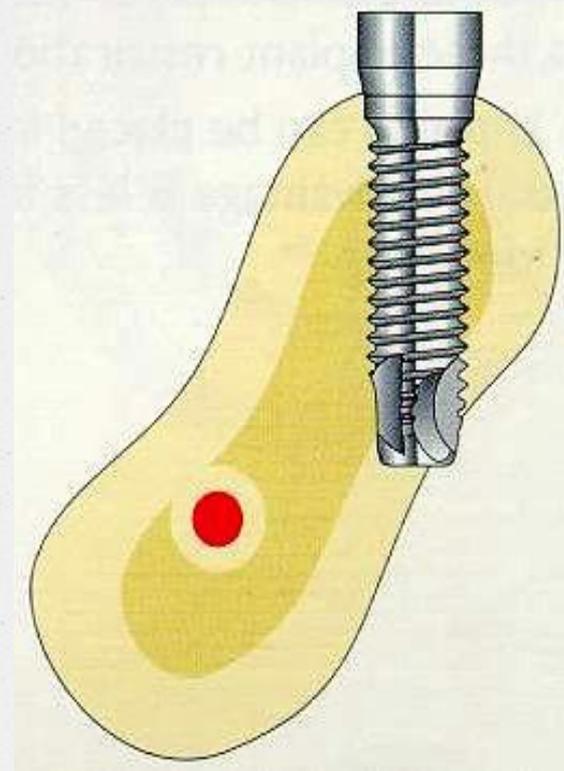


Buccal

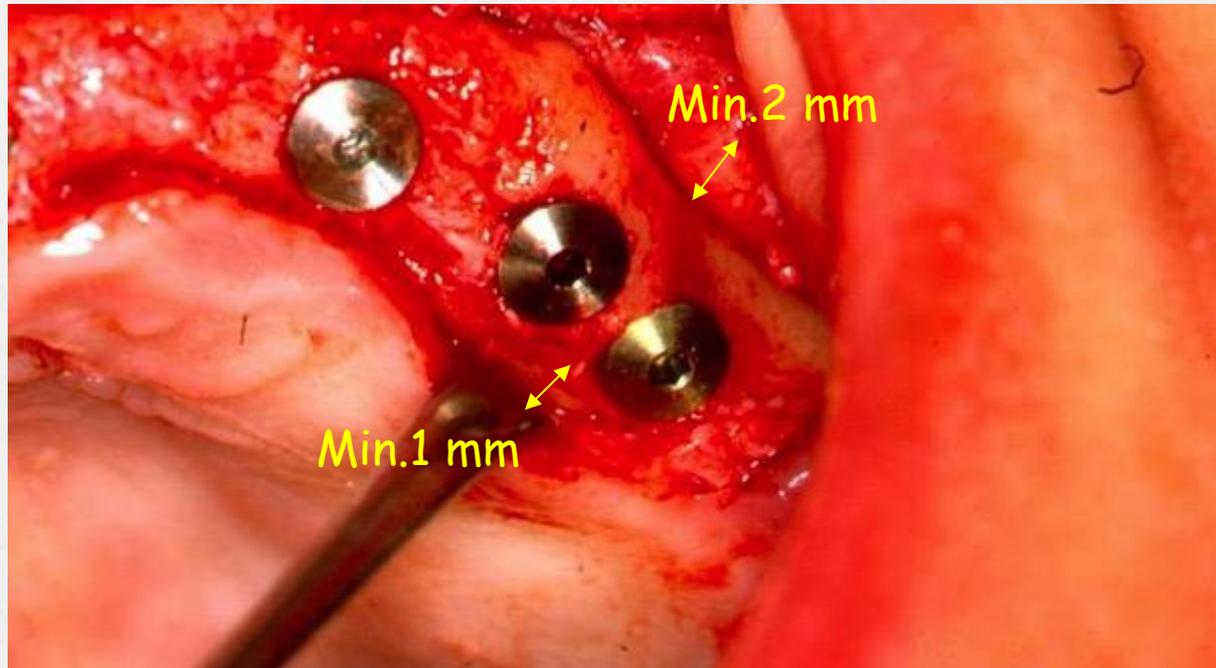
Lingual



## Anatomical dangers

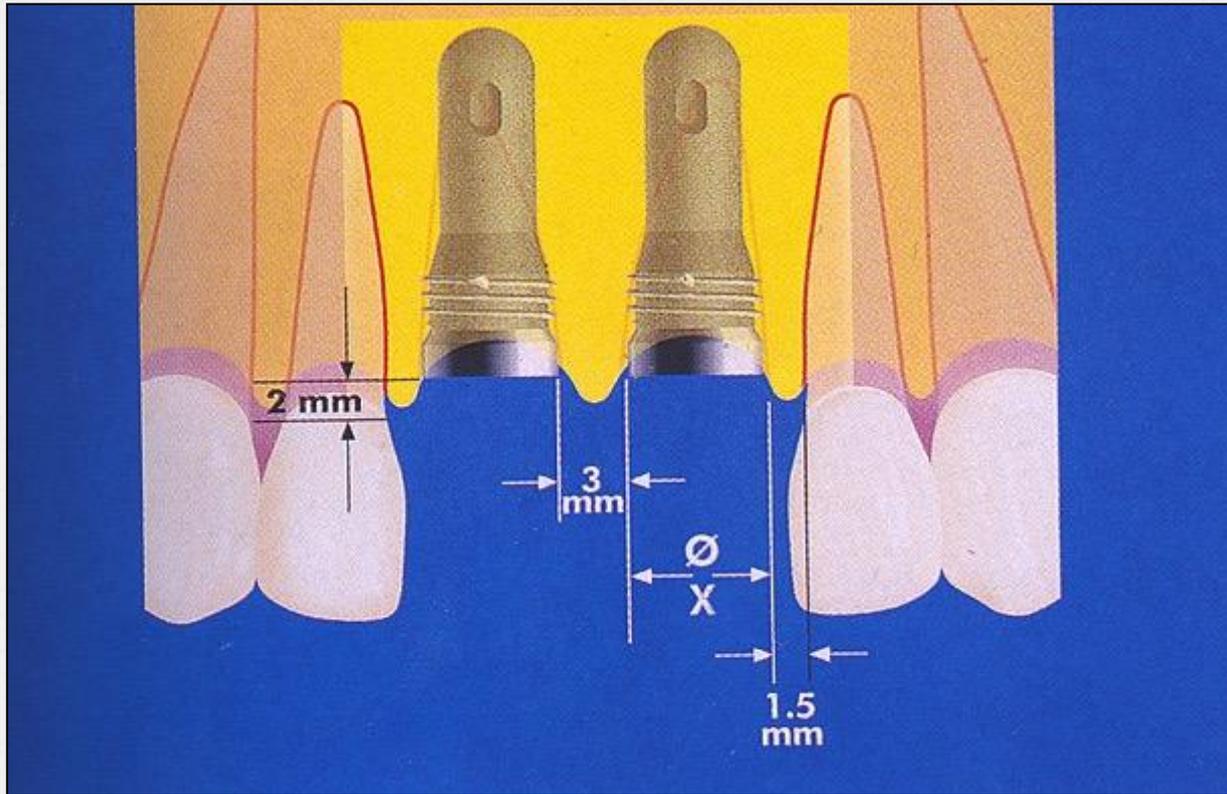


## Bone width

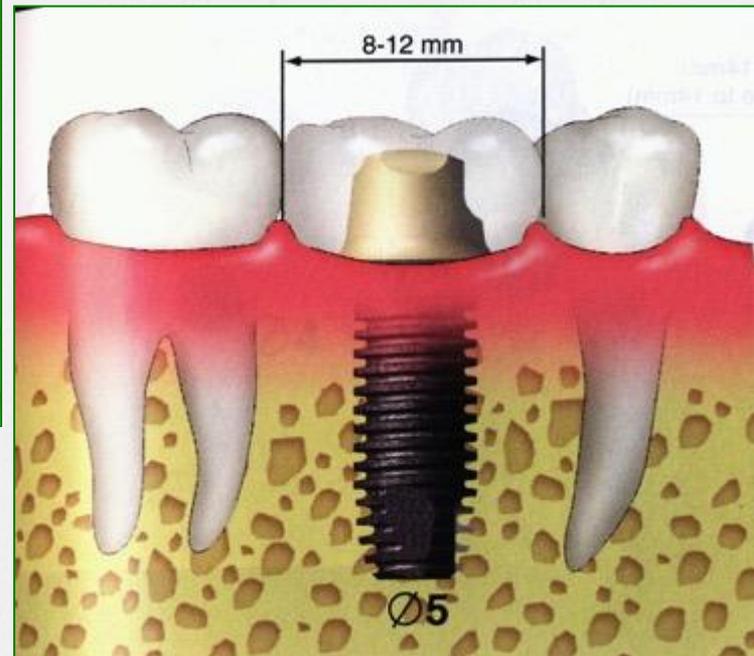
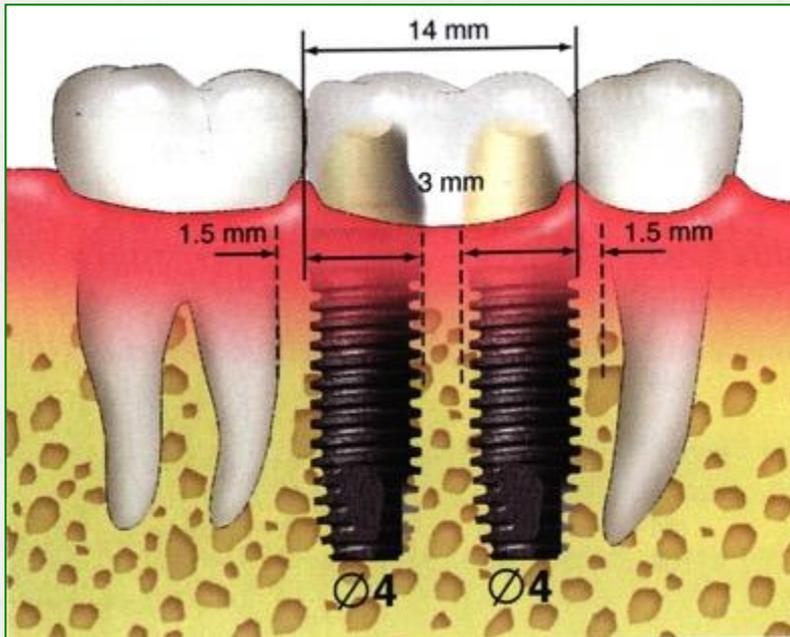


Edentulous ridge greater than 6mm demonstrated less crestal bone loss

# Bone length



# Bone length



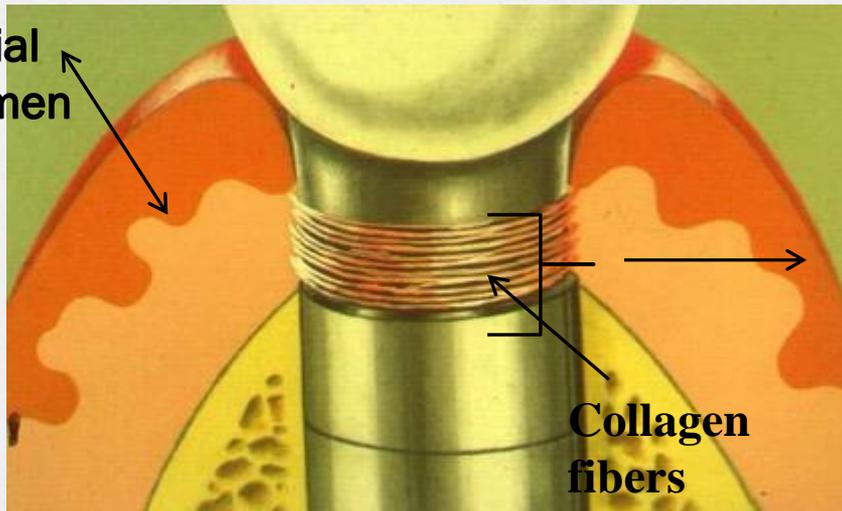
# Soft tissue

Factors, determining healthy implant/soft tissue relation:

- Vascularization
- Soft tissue structure (presence of attached gingiva)
- Implant design
- Implant surface
- Implant position

- ❖ Biological seal (peri-implant mucosa) is one of the key factors in long-term survival and success of implants.
- ❖ Peri-implant tissue (biological width) consists of sulcular epithelium and connective tissue layer.

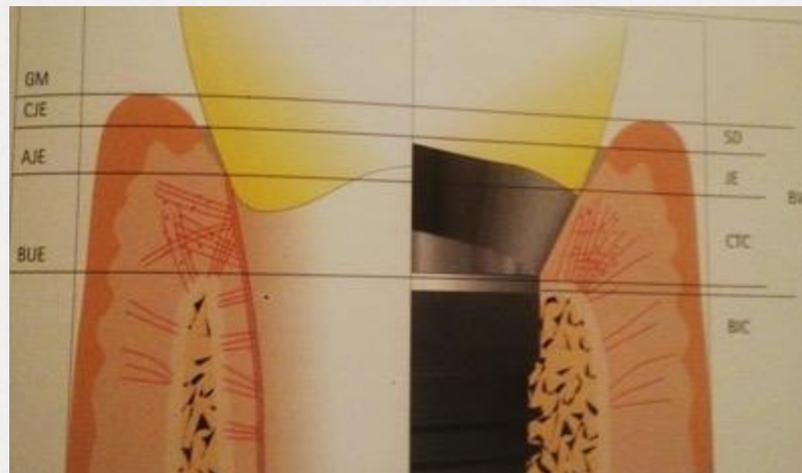
Epithelial  
attachmen  
t



A vertical dimension of  
Peri-implant connective  
tissue

There are essential differences between the natural periodontium and the peri-implant connective tissue:

- Lack of connective tissue attachment
- Hypovascular and hypocellular connective tissue around implant
- Lack of blood supply from periodontal ligament



Biological seal and as a result a long term survival of implants is determined by two very important factors:

- Presence of attached gingiva
- Biological width

Mucosa lying around an implant must measure at least 4mm from periosteum to marginal border of the peri-implant mucosa.

# Planning dental implants in different clinical situations

## Available implant supported prosthetic solutions:

- Fixed prosthesis
  - single crown(s)
  - fixed partial denture(s)
- Removable prosthesis
  - double crown technique
  - bar-retained technique: custom made or prefabricated
  - ball or locator attachment

## Number of implants required:

- In edentulous maxilla minimum 6 implants for fixed restoration and minimum 4 implants for removable
- In edentulous mandible at least 4 implants for fixed restorations and at least 2 for removable overdentures

## Special consideration in restoring teeth in esthetic zone



Successful esthetic outcome depends on preservation or restoration of natural anatomy i.e. maintaining a natural pink and white line

- Preservation of bony structure by atraumatic extraction, socket preservation
- Preservation of soft tissue by using interim provisional restorations, custom-made gum formers, ,implant-supported long term provisional crowns.
- Interdental papilla preservation ( immediate implant placement )

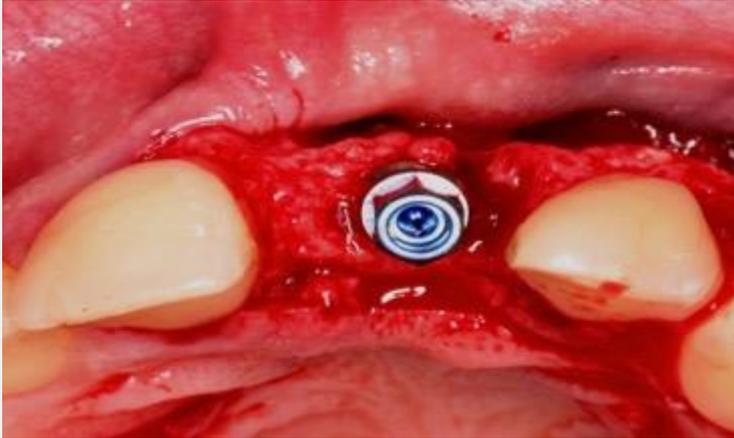
## Single -tooth gap in anterior region



Fracture of the the  
Tooth N21 after  
bicycle  
accident



## Single -tooth gap in anterior region



## Single -tooth gap in anterior region



Reopening with free tissue  
grafting



## Single -tooth gap in anterior region



Long term provisional crown  
with  
Individualized abutment



## Single -tooth gap in anterior region



Zirconia abutment for final restoration

Zirconia final restoration



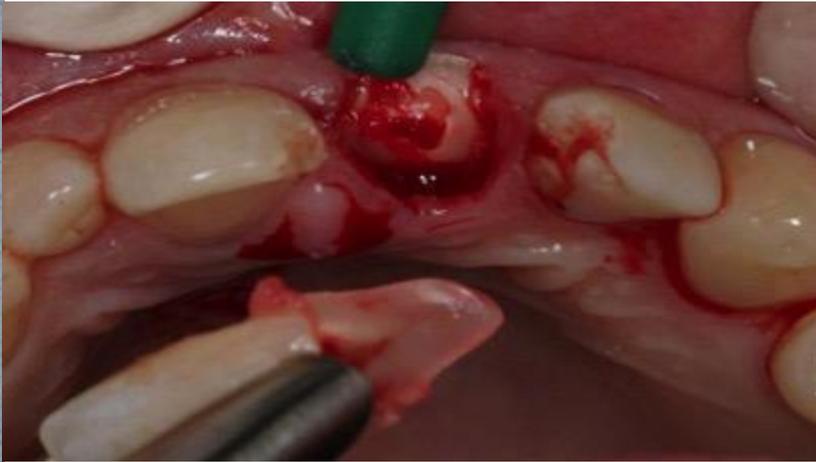
## Restorations in esthetic zone



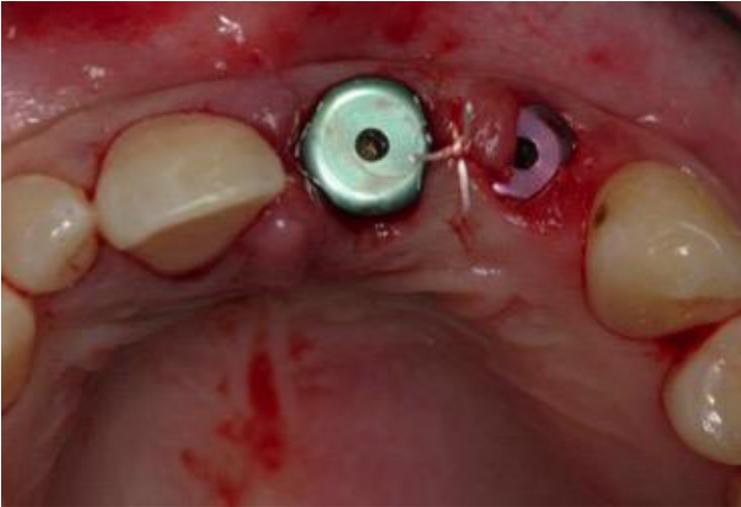
Traumatic fracture of the teeth  
N 21,22



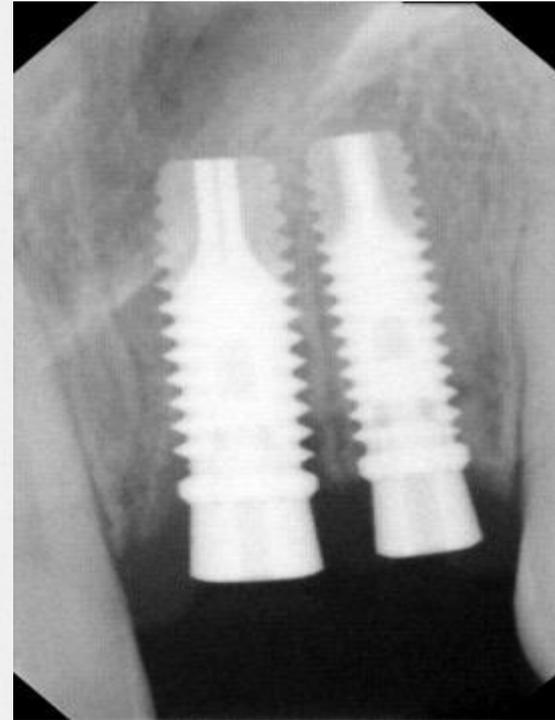
## Restorations in esthetic zone



## Restorations in esthetic zone



- Immediate implantation
- Open healing with the use of gingival shapers to preserve the soft tissue contour



## Restorations in esthetic zone



## Lateral edentulous gap

- When there edentulous spaces between the teeth present it is possible to restore them with conventional bridge or with implants
- Assessment of vertical and horizontal bone dimensions
- Usually delayed implant placement is opted for
- Augmentation procedures when necessary



# Free-end situation in the maxilla and mandible

- ❖ First we must check if the teeth are worth preserving.
- ❖ If not how much transverse and vertical bone is available
- ❖ Necessity of sinus lift or bone augmentation
- ❖ Stepwise procedure
- ❖ In many cases because of inferior alveolar nerve proximity in mandible the use of computer-navigated surgical templates is advocated.

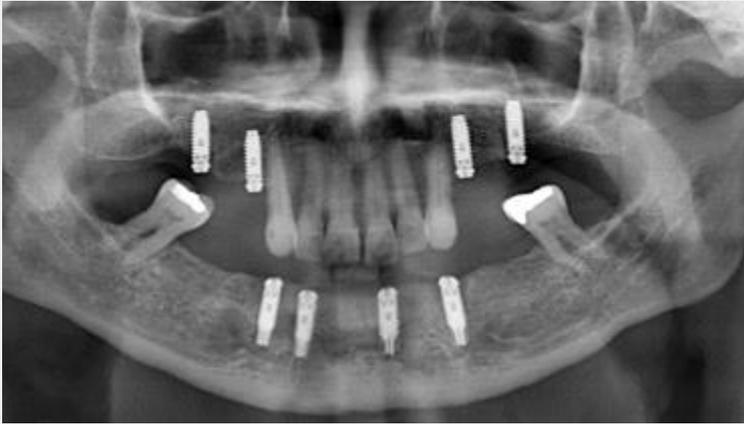
## Free-end situation in the maxilla and mandible



# Edentulous mandible

- ❖ The prosthetic aim is a fixed restoration however the possibility of injury to the inferior alveolar or mental nerve poses certain limitations .
- ❖ Compromises should be made in advanced mandibular atrophy when implants are placed interforaminally.
- ❖ Extensive bone augmentation is an alternative.
- ❖ Use of computer- navigated implant placement.

# Edentulous mandible



# Edentulous mandible



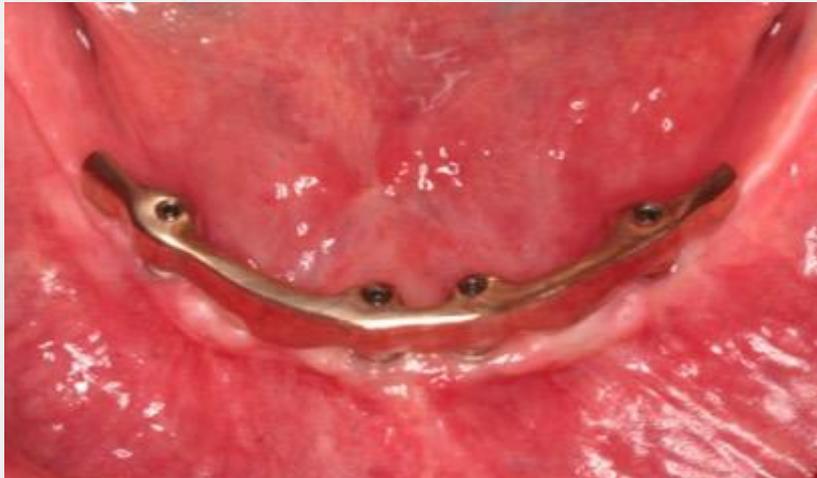
Screw-retained full denture



# Edentulous mandible



# Edentulous mandible



Bar-retained removable denture.

Individually made bar.

# Edentulous mandible



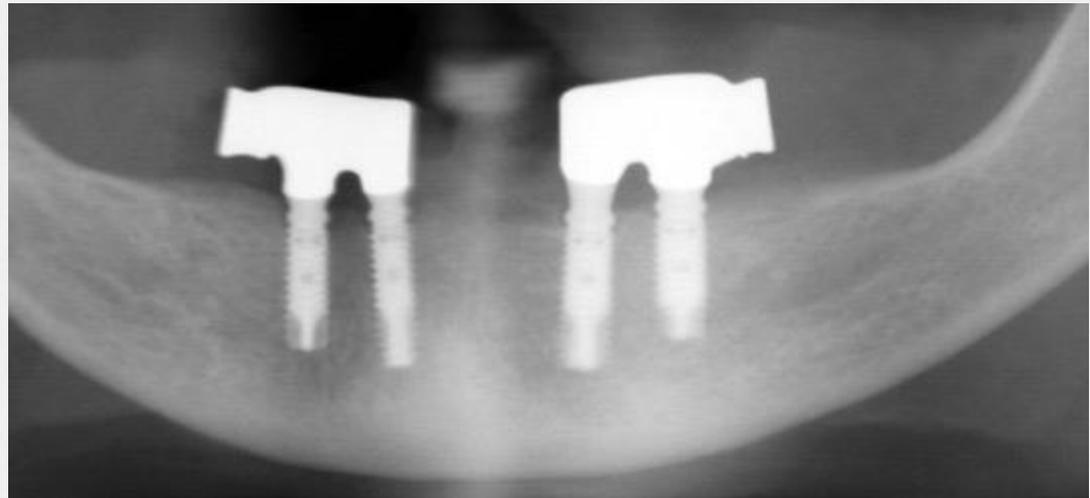
# Edentulous mandible



# Edentulous mandible



Panoramic X-ray before  
and after treatment



# Edentulous mandible



# Edentulous maxilla

- ❖ Most patient don't have enough vertical or horizontal bone
- ❖ Maxillary sinus floor elevation and different augmentation techniques are often necessary.
- ❖ Diagnostic wax-up is important to check interrelation of jaws.
- ❖ Careful evaluation of face profile .
- ❖ Fixed prosthesis vs. implant supported removable denture.
- ❖ Navigated drilling templates are often required.

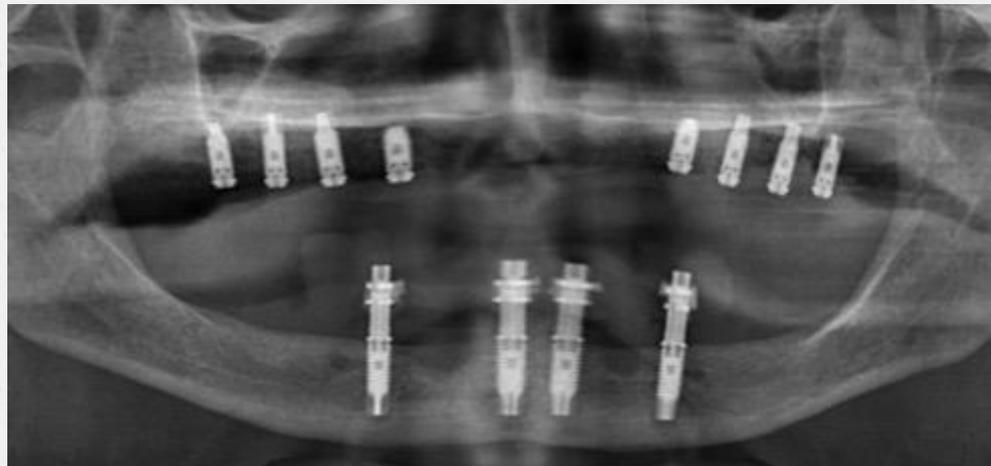
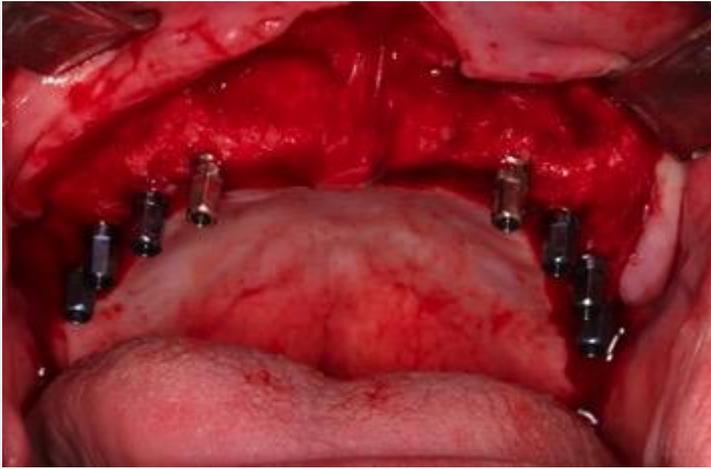
# Edentulous maxilla



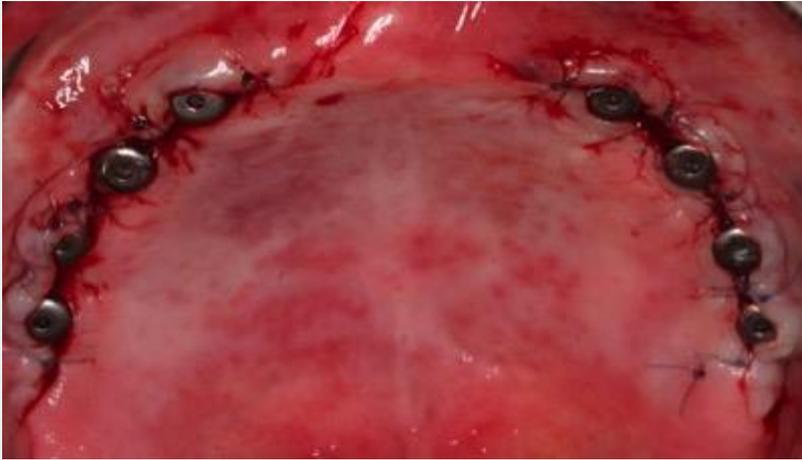
Implant placement after  
double sinus lift surgery



# Edentulous maxilla



# Edentulous maxilla



Reopening of implants



# Edentulous maxilla



Impression coping

Individual bars



## Edentulous maxilla



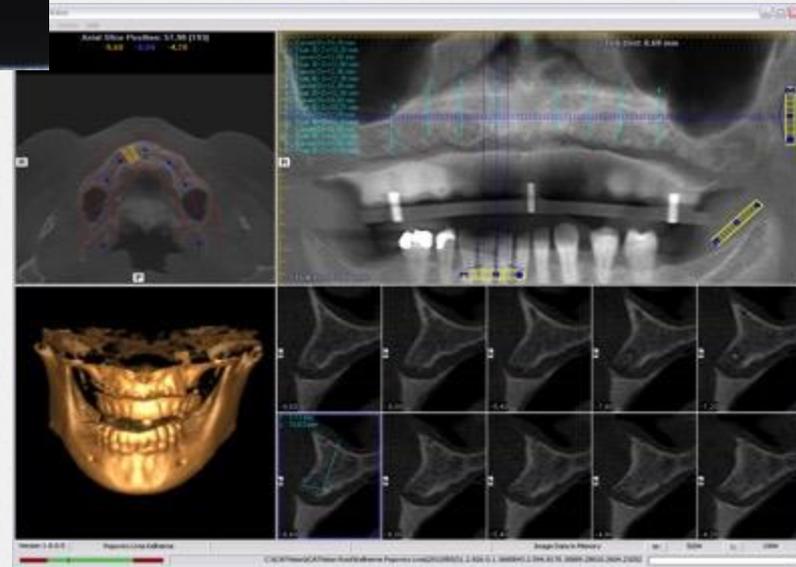
Final result: Bar-retained overdenture

# Edentulous maxilla

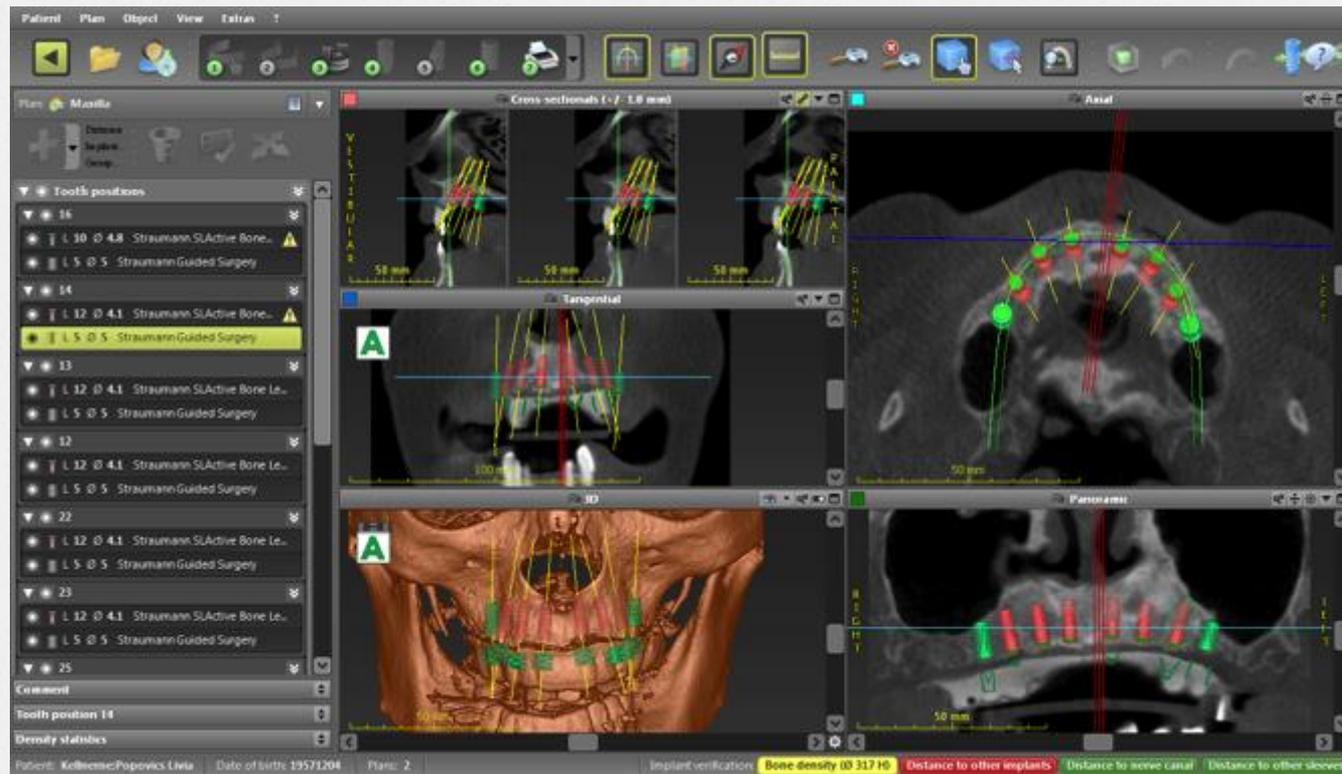


Panoramic X-Ray of a patient:  
Question: to keep the teeth or  
extract?

After extracting all teeth  
and adequate healing  
period computed-guided  
planning and implant  
placement was chosen.



# Edentulous maxilla



# Edentulous maxilla



# Edentulous maxilla



Postoperative view

3 day after the surgery



# Edentulous maxilla



# Edentulous maxilla



**Thank you for your  
attention!**

