Esthetic considerations in implant therapy.

Surgical management of soft tissues.

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Past

The indication of implant therapy was determined by the anatomic conditions of bone.

Present

The indication of implant therapy can be any of those re-establishment of the function and esthetics of natural teeth.
Common commercials of implant therapy
Beauty does not arise from the particular character of a form, but from the dynamic relationship existing between forms.
Esthetic zone: was defined as any dentoalveolar segment that is visible upon full smile

/Consensus Statements and Recommended Clinical Procedures Regarding Esthetics in Implant Dentistry. 2004/
Factors **determining** the esthetic value of implant therapy

- position of the implant
- profile of surrounding hard and soft tissues
- form and colour of prosthetic crown — **prosthetic issue**
Surgical stages of completing esthetic implant restorations

- patient evaluation, diagnostics
- surgical preparation
- implant placement
- soft tissue management
Surgical stages of completing esthetic implant restorations

- patient evaluation,
- diagnostics
  - surgical preparation
  - implant placement
  - soft tissue management
Esthetic considerations in diagnostic evaluation

- risk assessment

- evaluation of anatomic conditions
  - hard, soft tissues
  - position of teeth
Examination of the form and display of teeth

From the upper incisor

at men ~ 1.91 mm
women ~ 3.40 mm
is visible

It can be more at young, and less at elderly people

(Chiche G., Pinault A.: Esthetics of anterior fixed prosthodontics. 1994)
Examination of the periodontium

- determination of the smile line
Excessive gingival display, over 3.0mm, can be esthetically displeasing

“gummy smile” = esthetic risk

(Chiche G., Pinault A.: Esthetics of anterior fixed prosthodontics. 1994)
Gingiva is not visible at smiling
Examination of the periodontium

- determination of the smile line
- examination of the gingival outline
Straight pattern of gingival outline

Sinuous pattern of gingival outline

(Sclar A. G.: Soft tissue and esthetic considerations in implant therapy. 2003)
Asymmetries of gingival outline
Examination of the periodontium

- determination of smile line
- examination of the gingival outline
- biotype of the periodontium
Thick, flat periodontium


- not inclined to recession
- higher degree of scar formation
Thin, scalloped periodontium


- inclined to recession
- low degree of scar formation
Thin, scalloped **periodontium**


- inclined to recession
- low degree of scar formation
Thick, flat biotype /15%/  

Thin, scalloped biotype /85%/
Surgical stages of completing esthetic implant restorations

- patient evaluation, diagnostics
- **surgical preparation**
  - implant placement
  - soft tissue management
Surgical preparation for implant therapy

- Bone grafting procedure
- Soft tissue preparation
Frenulectomy
Frenulectomy
Surgical stages of completing esthetic implant restorations

- patient evaluation, diagnostics
- surgical preparation
- implant placement
- soft tissue management
Ideal position of dental implants
Biologic width

A constant vertical dimension of periodontal, periimplant soft tissues

Hermann JS, Buser D, Schenk RK, Schoolfield JD, Cochran DL.: Biologic Width around one-and two-piece titanium implants
Clinical Oral Implants Research 12, 2001; 559-571
Biologic width
Average values of biologic width, measured in cadavers:

2.04 mm /Gargiulo A. W. et al. 1961/

0.75-4.33 mm /Vacek J. S. et al. 1994/

Clinical average value: 3.0 mm
The optimal vertical position of dental implant
Inproper vertical implant placement
The optimal oro-vestibular position of dental implant
Implant placed too far palatally
Forming of the alveolar process by grafting procedure
Immediate implantation with GBR
Immediate implantation with GBR
Major issue: the missing papilla
Arteficial gum is not esthetically pleasing
The form of papilla adjacent to the implant, is determined by the vertical height of alveolar septum.
In the case of more than 5.0 mm distance between the peak of septum and the contact point of crowns, the development of a papilla is uncertain.
Form of papilla and the height of the septum
Possible times of implant placement following the loss of tooth

/Hammärle et al. 2004/

- **Immediate** - at the same time of tooth removal
- **Delayed** - 4-8 weeks later
- **Early** - 3-4 months later
- **Late** – completely healed jaw,
  
  4-6 months later
Immediate implantation
Immediate implantation, prosthetic restoration
Immediate implantation
Temporary crown immediately after implant placement
Surgical stages of completing esthetic implant restorations

• patient evaluation, diagnostics
• surgical preparation
• implant placement

• soft tissue management
Surgical protocols of implant placement can be:

• One-Stage
  Implant placement.
  Transgingival healing.

• Two-stage
  I. Implant placement,
  submerged healing
  II. Exposing and forming of gingiva. Abutment connection.
Types of second stage surgery

- Sufficient Quantity, quality of gingiva
  - Apically positioned flap
  - Connective tissue graft
  - Gingiva excision

- Insufficient Quantity, quality of gingiva
  - Papilla reconstruction
Gingiva formed by transmucosal abutment
Types of second stage surgery

**Sufficient**
Quantity, quality of gingiva

- **Apically positioned flap**

**Insufficient**
Quantity, quality of gingiva

- **Papilla reconstruction**
- **Connective tissue graft**

**Gingiva excision**
Gingiva forming with apically positioned flap
Gingiva formed by apically positioned flap
Gingiva formed by apically positioned flap
Gingiva forming by apically positioned flap and temporary crown
Implant-abutment connections

Conventional

Platform switching,
/Platform shifting/
Re-establishment of biologic width after conventional abutment connection
Re-establishment of biologic width after abutment connection

Platform switching, Platform shifting/

Conventional connection
Types of second stage surgery

Sufficient Quantity, quality of gingiva

Apically positioned flap

Connective tissue graft

Gingiva excision

Insufficient Quantity, quality of gingiva

Papilla reconstruction
Papilla regeneration technique I.

/P. Palacci/
Papilla regeneration technique II.

/P. Palacci/
Opening of the implant with reconstruction of the papilla / Haessler, Kornmann 1998, Misch 2004 / I. Figure
Opening of the implant with reconstruction of the papilla. II. Figure „Split finger” technique
At small pedicle flaps, due to the impaired blood supply, necrosis may occur.

/Rosenquist 1997, Adriaenssens et al. 1999/
Papilla reconstruction with H-shape flap /Hahn et al. 2005, Shahidi et al. 2008/
Upper lateral incisor before removal
Placed and healed implant
Gingiva forming by H-shape flap
Abutment frased and ceramic crown completed
Types of second stage surgery

Sufficient
Quantity, quality of gingiva

Insufficient
Quantity, quality of gingiva

Apically positioned flap

Papilla reconstruction

Connective tissue graft

Gingiva excision
Connective tissue graft from the palate
Schematic illustration of connective tissue grafting
Connective tissue grafting
Connective tissue grafting
Recommended timing of connective tissue grafting

Implantation → 3.5 months → Tissue grafting

Tissue grafting → 6 weeks → Prosthetic therapy

5 months