The essential conditions of success of the implantation II.

Gingival seal.

Progressive osseointegration.

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Department of Oral and Maxillofacial Surgery

Conditions of success of oral implants

- Biocompatibility
- Gingival seal
- Optimal transmission of masticatory forces

Surgical protocols of implant placement can be:

- One-Stage

  Implant placement.

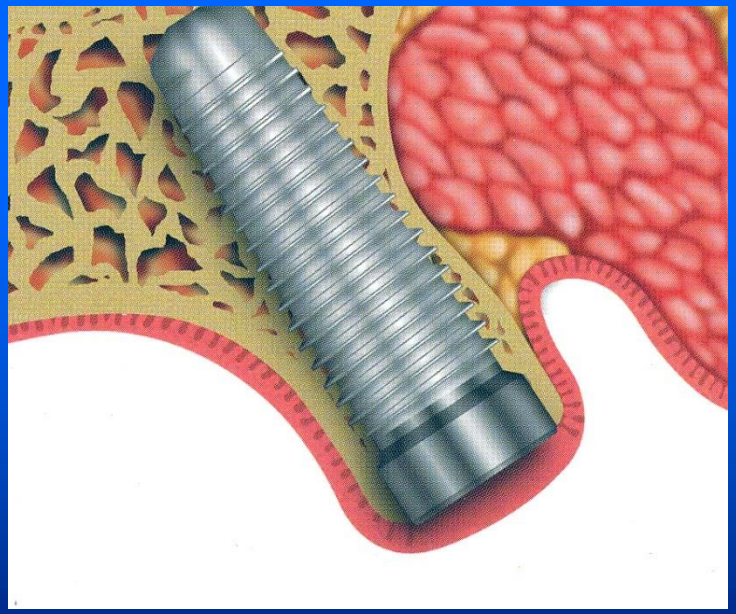
  Transgingival healing.

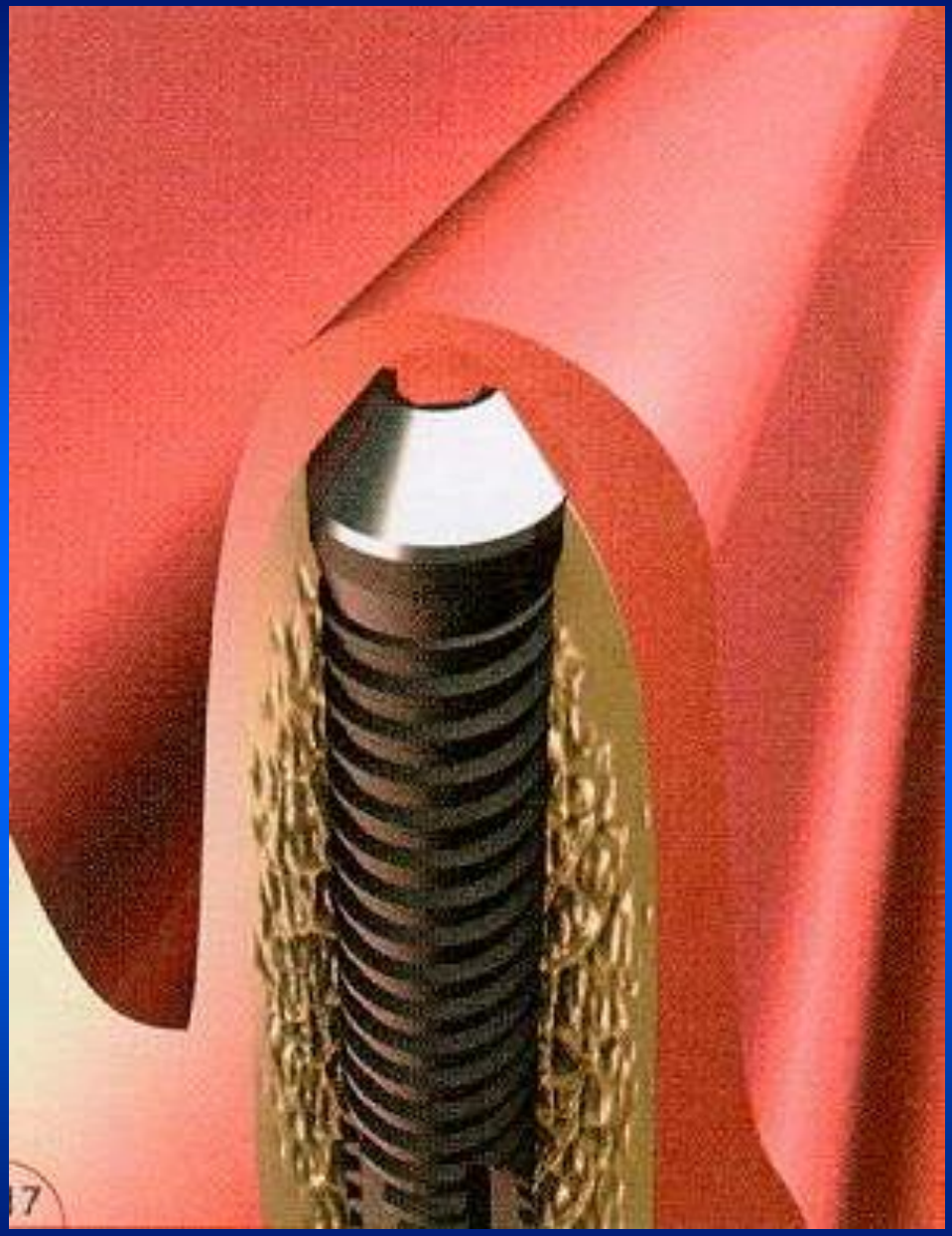
- **Two-stage**

  I. Implant placement,

  submerged healing

  II.Exposing and forming of gingiva. Abutment connection.



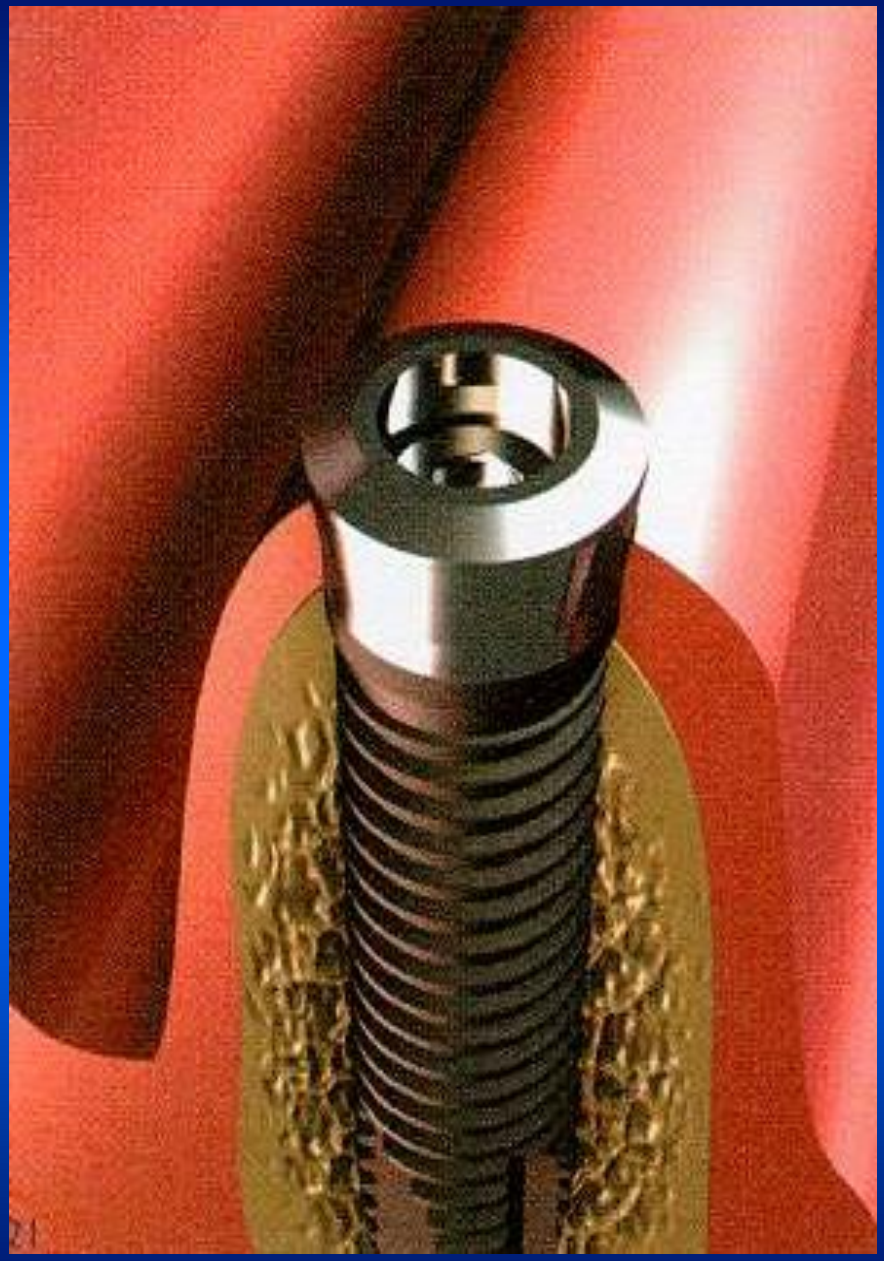


Healed two-part implant

Two-stage surgical protocol:

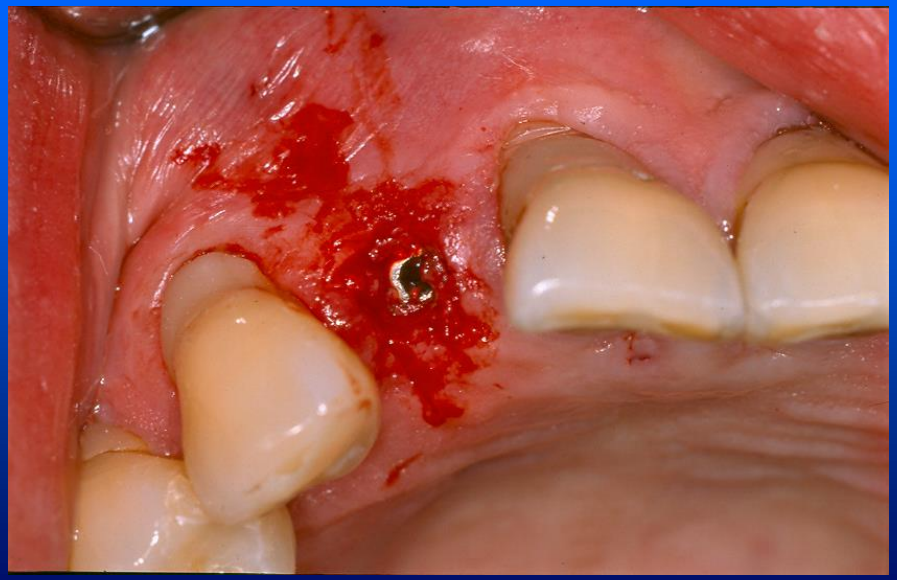
2. operation

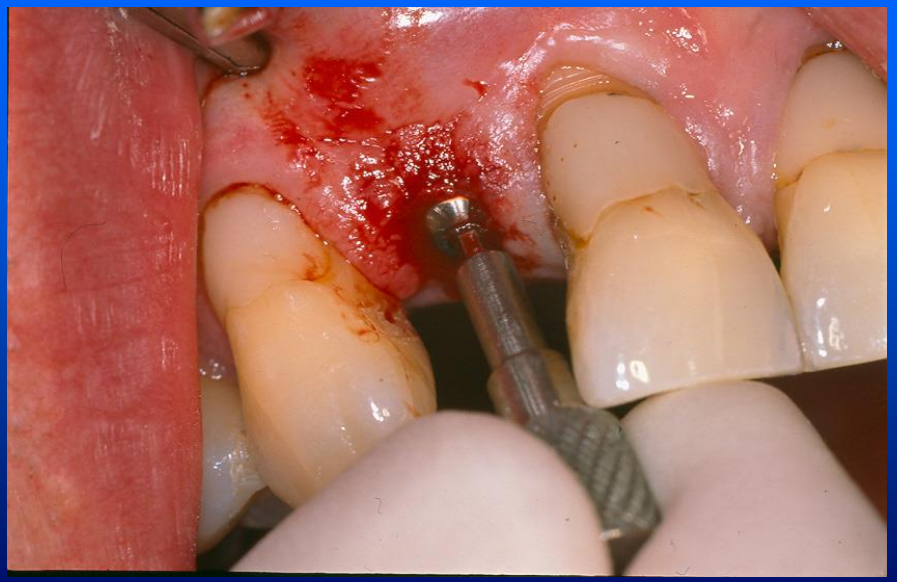
Placement of a healing abutment



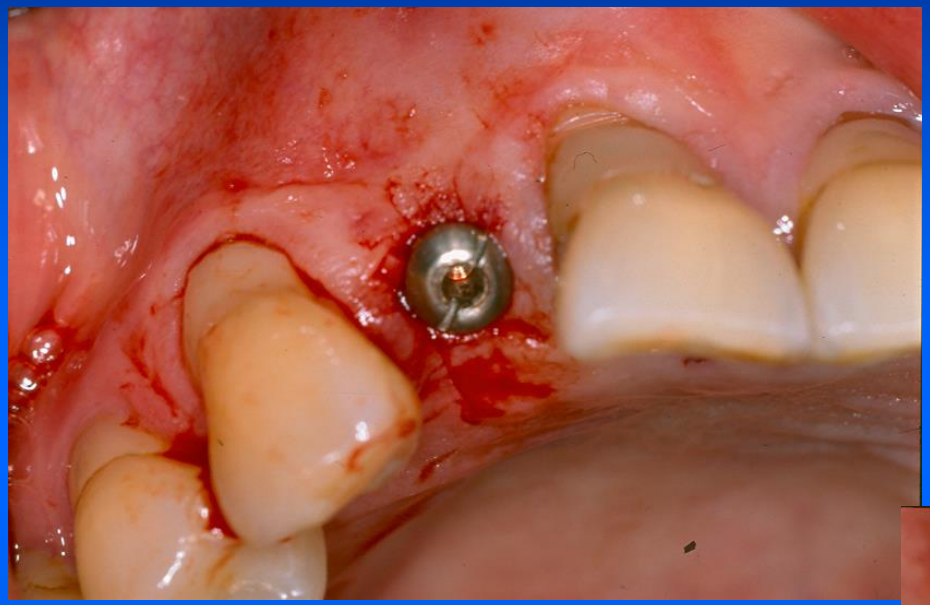
Healing abutment in place

Excision of the mucosa over the implant

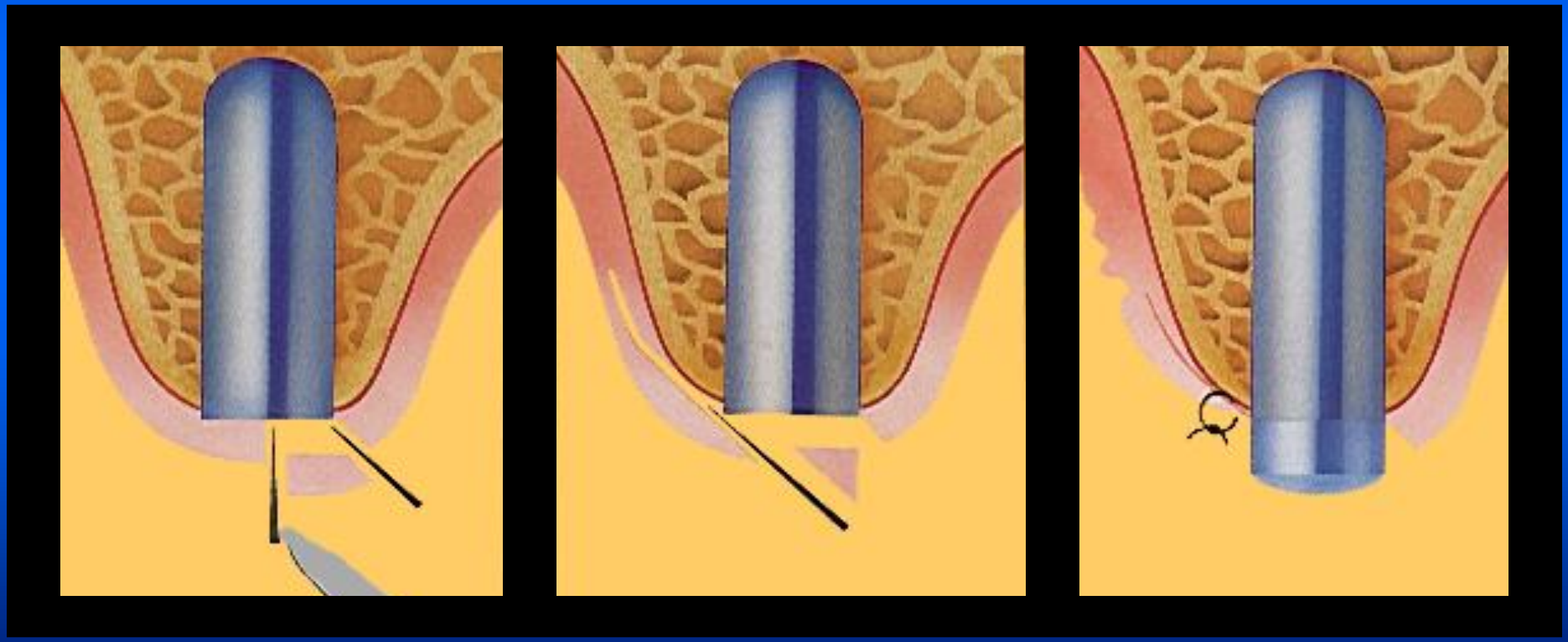


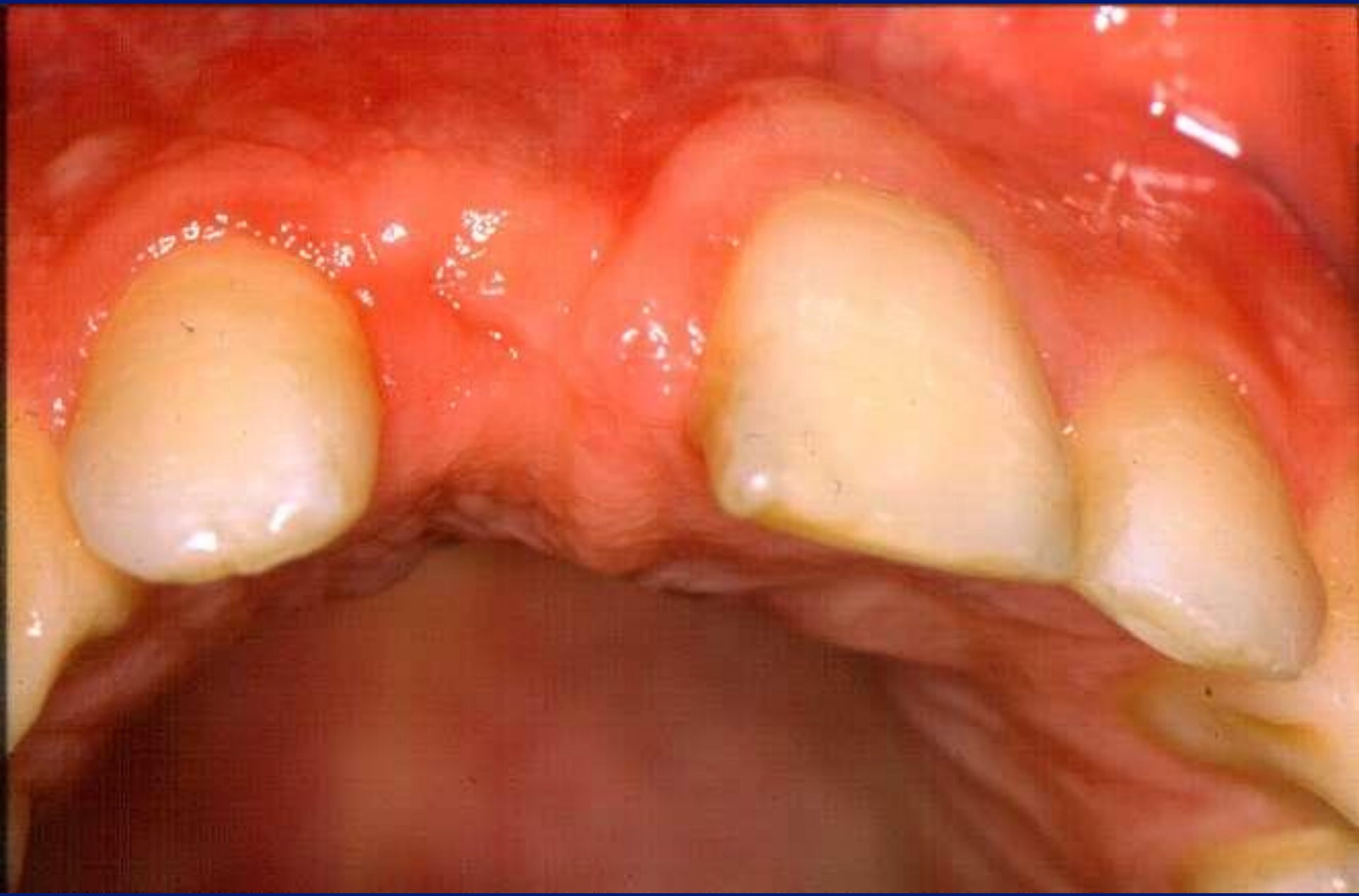


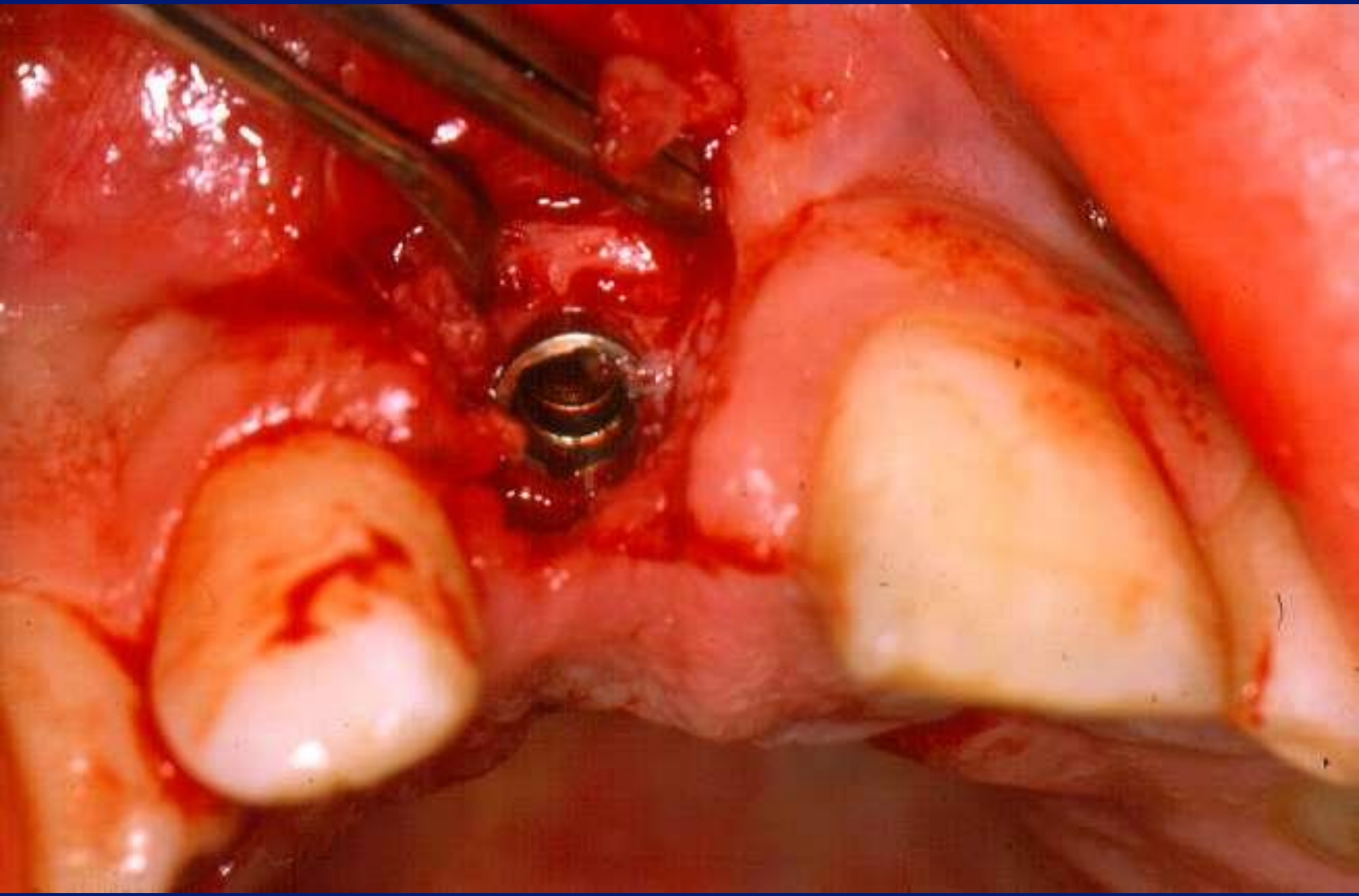
Placement of gingiva former /healing abutment/ **after the excision**

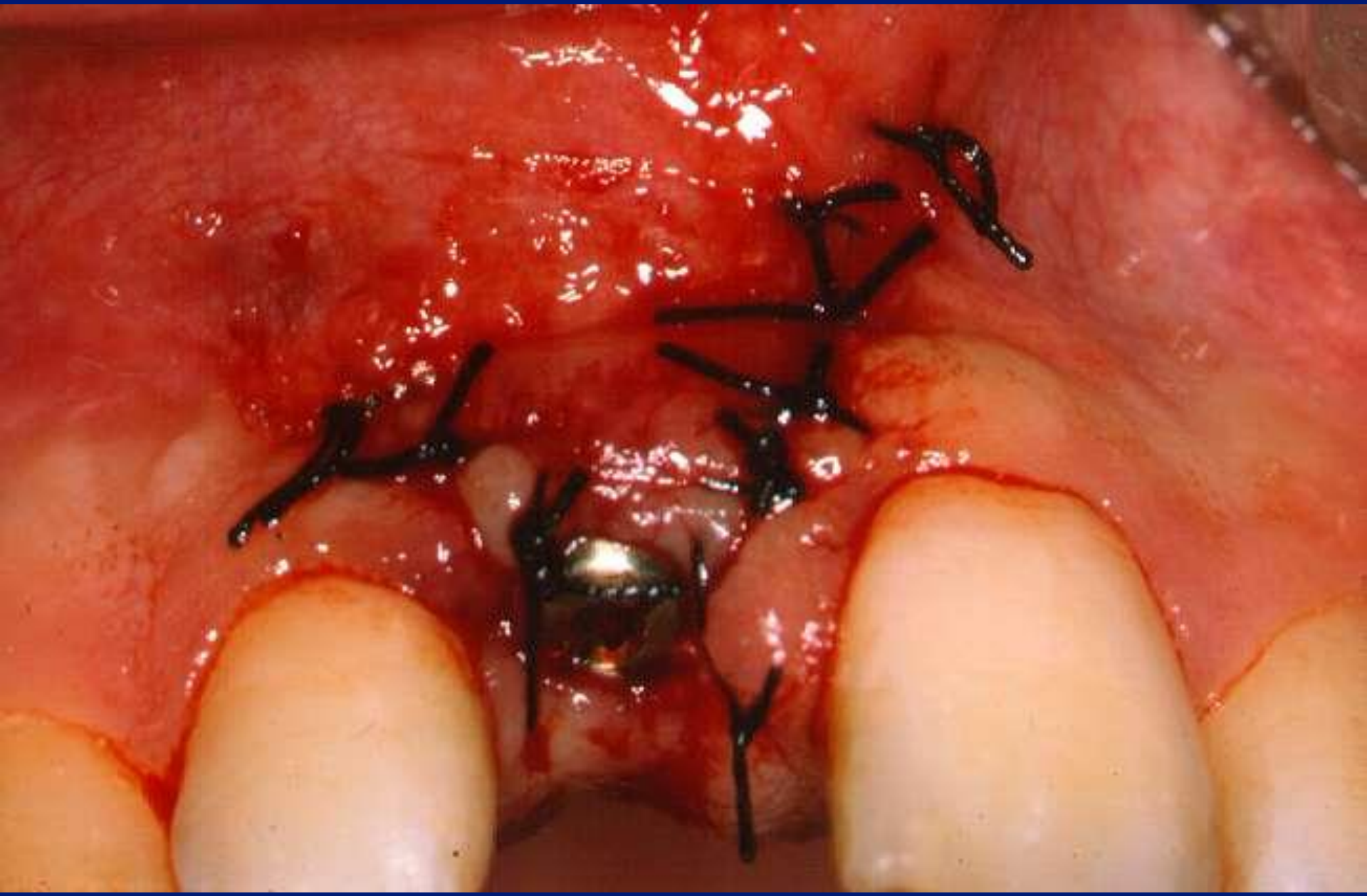


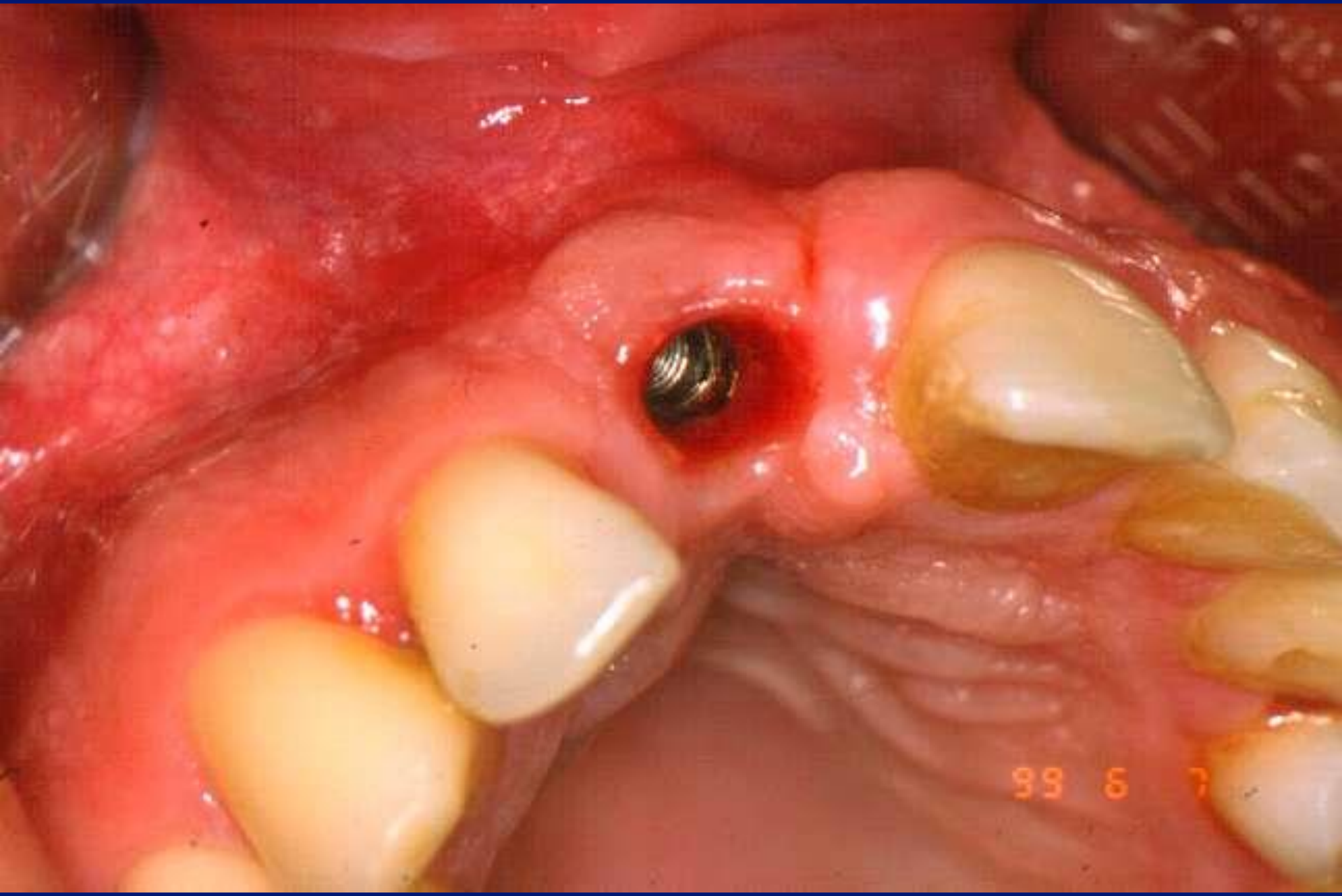
APICAL REPOSITIONING OF FLAP







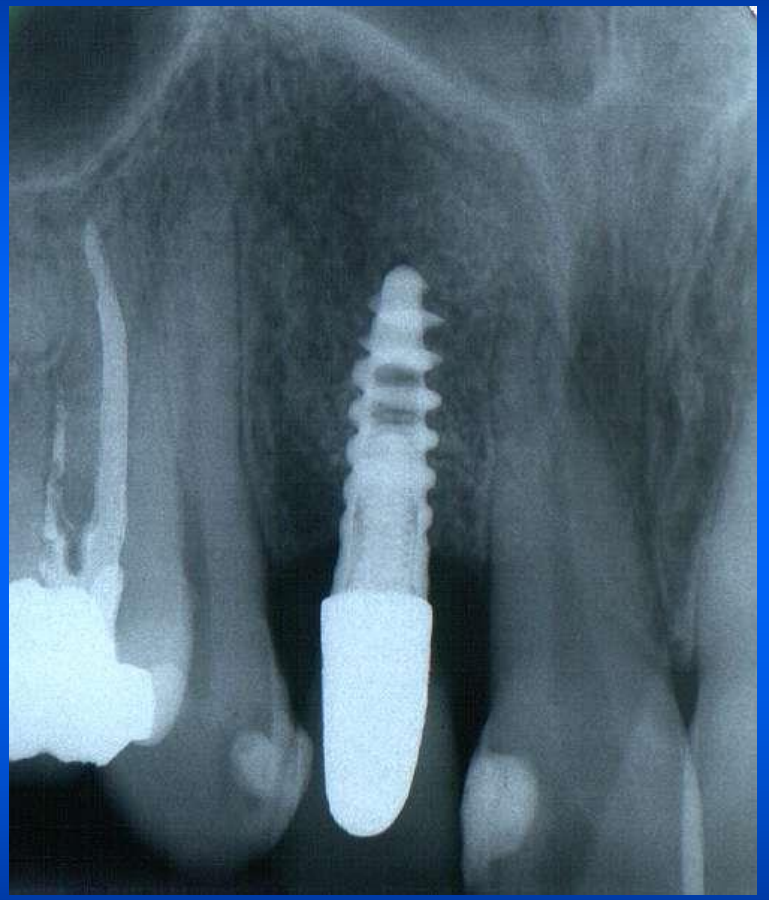





99 6 7

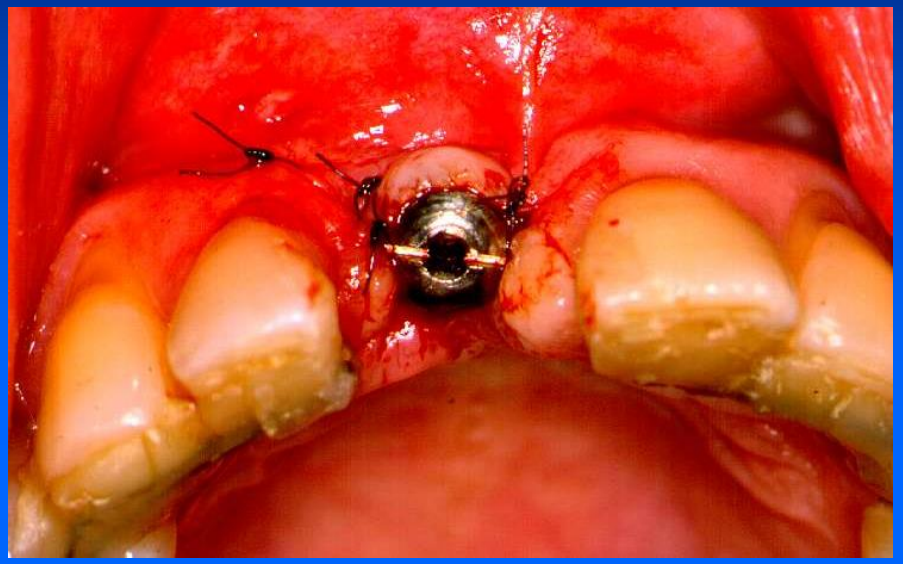
Forming of peri-implant mucosa by apically positioned flap

Gingiva forming and ceramo-metal crown



Gingiva forming by apically positioned flap

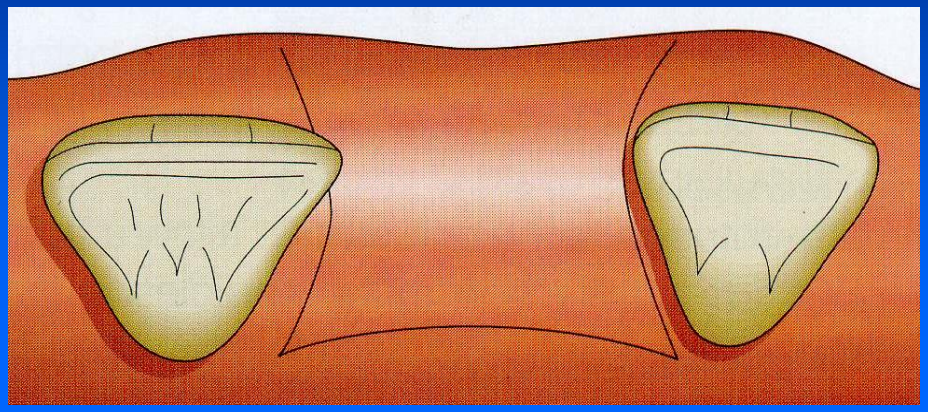
Gingiva forming by apically positioned flap

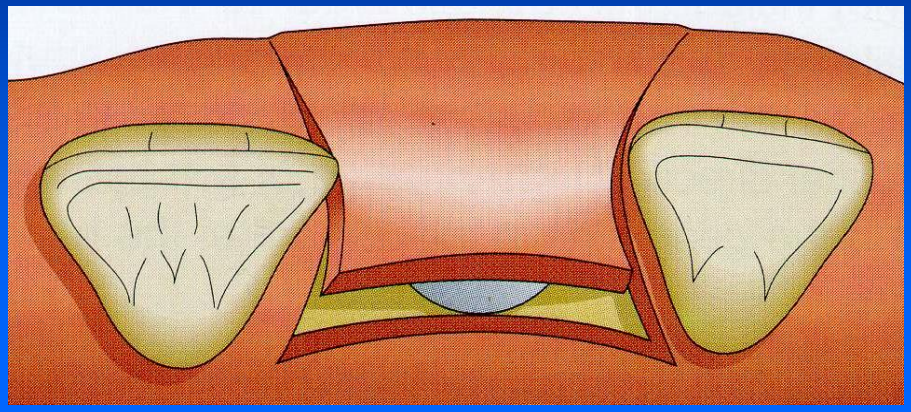


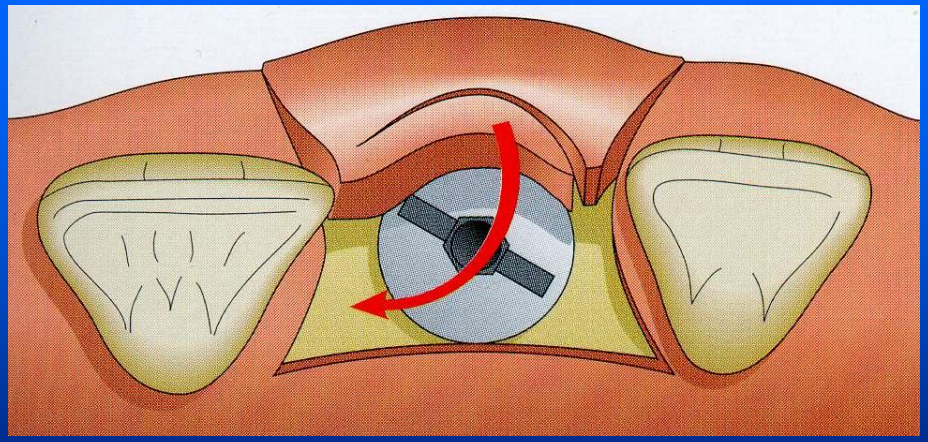
The result of apically positioned flap and temporary crown

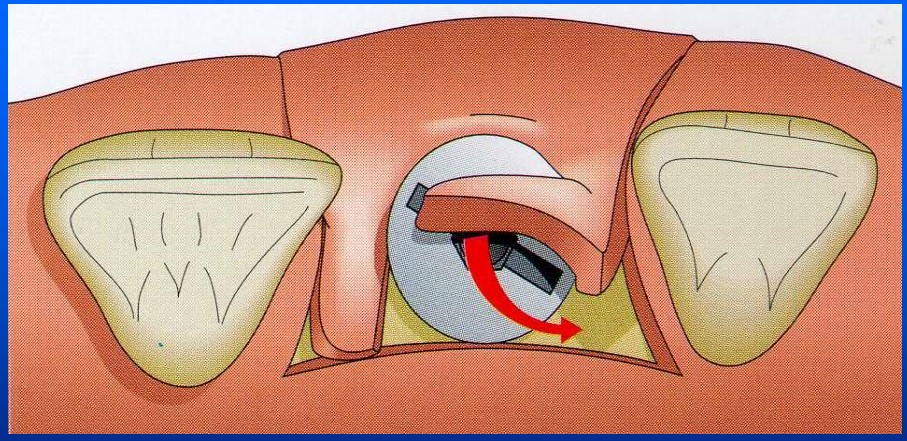
Papilla regeneration technique I.

/P. Palacci/



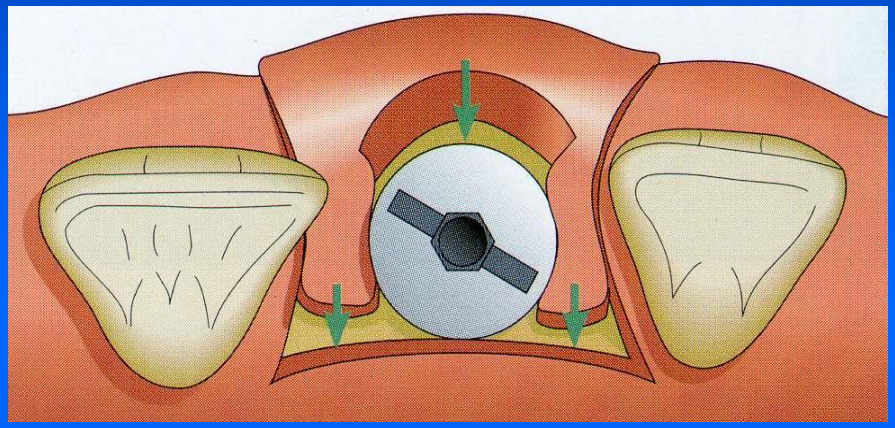


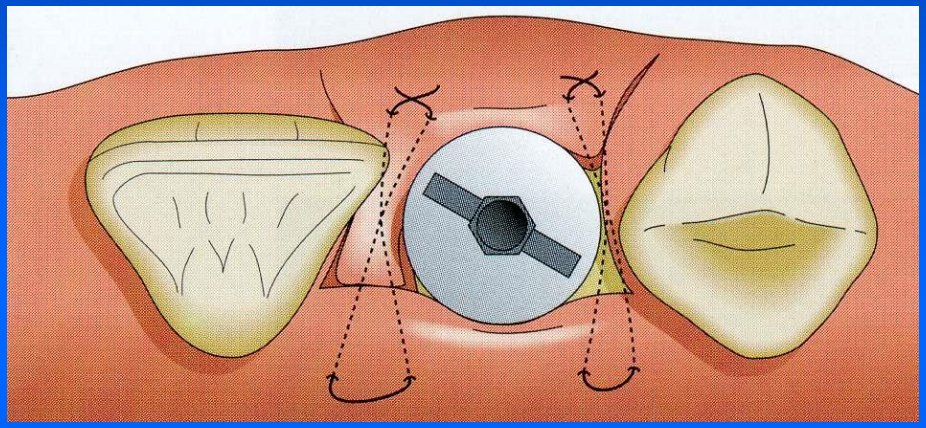


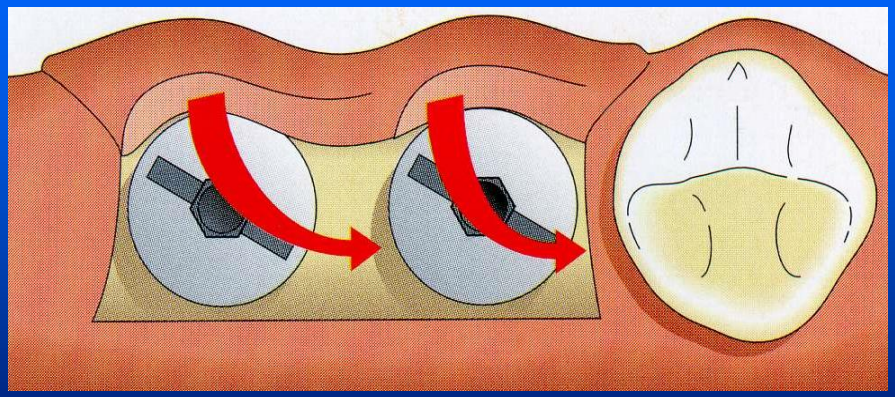


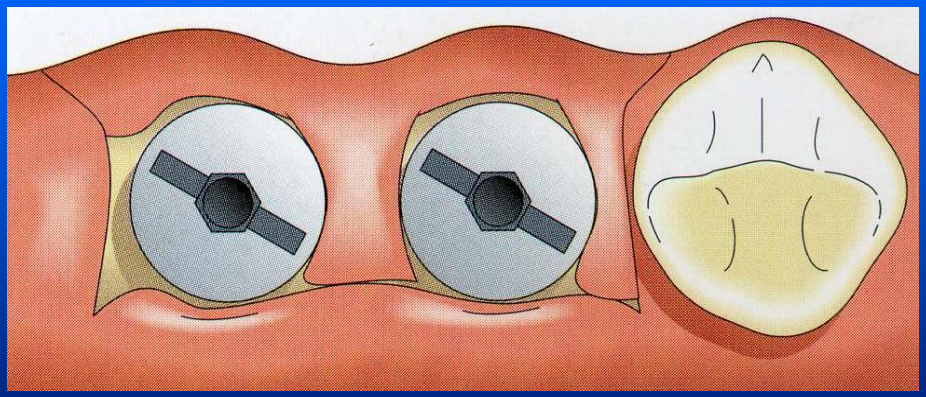
Papilla regeneration technique II.

/P. Palacci/



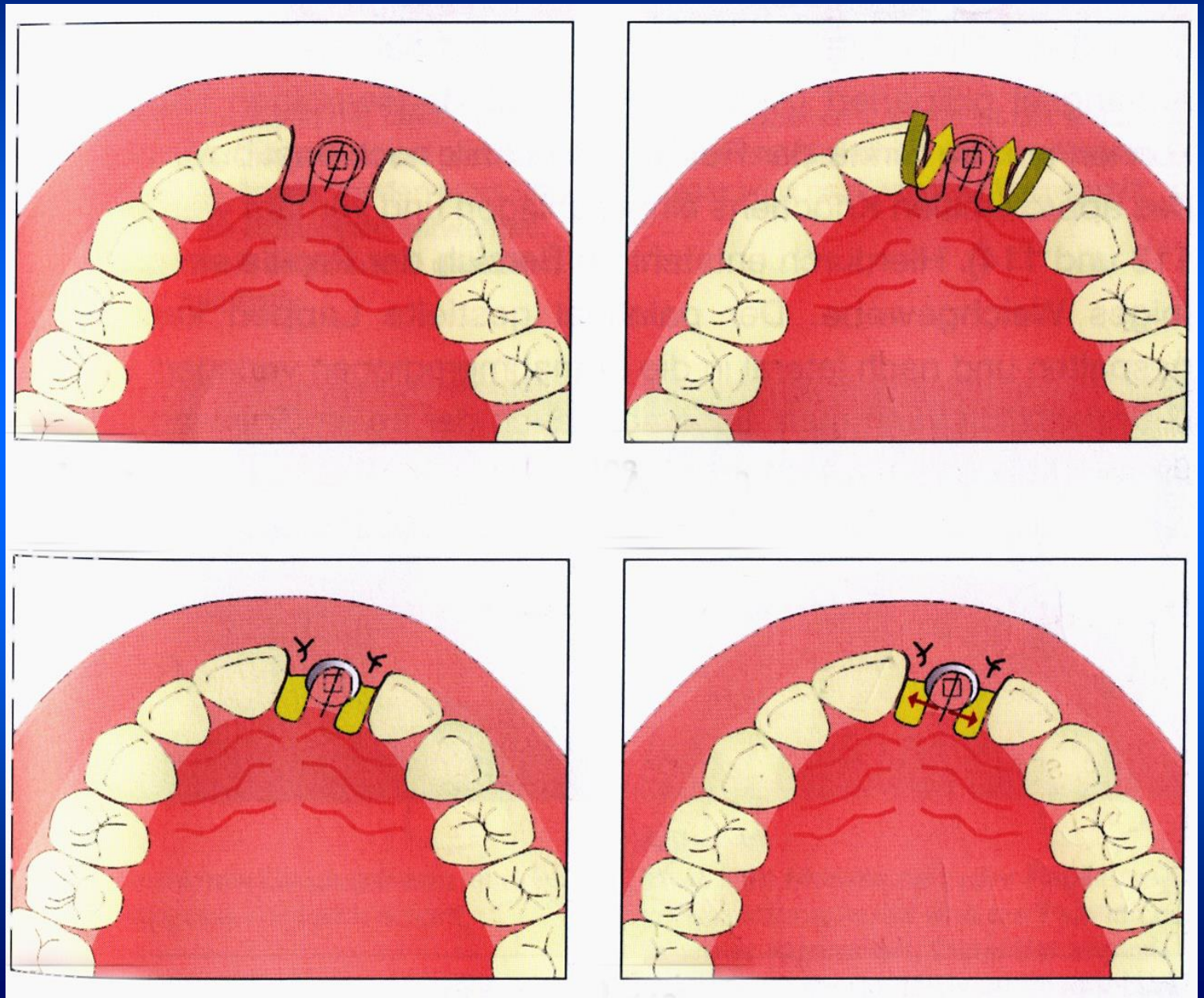




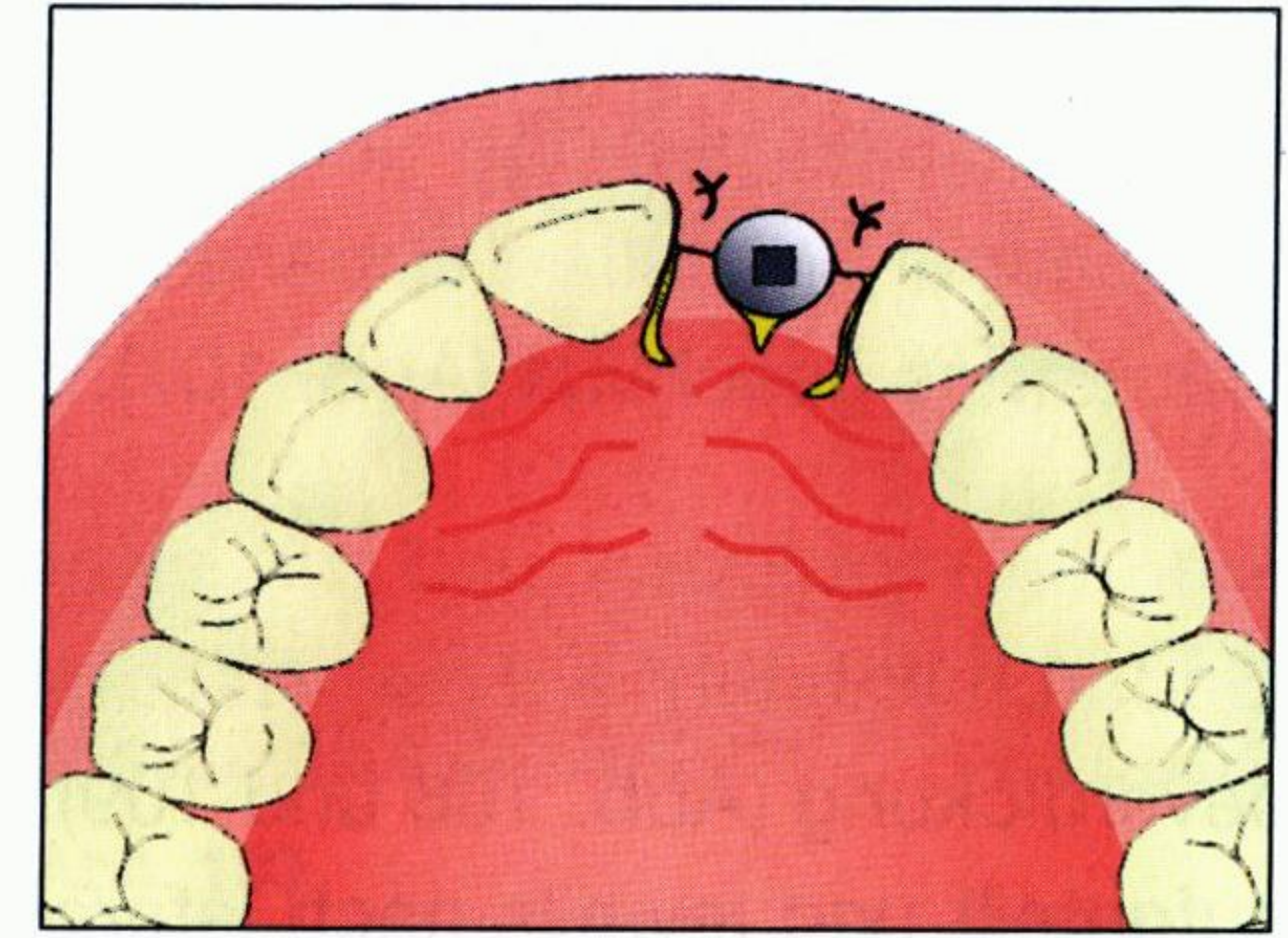


Opening of the implant with reconstruction of the papilla

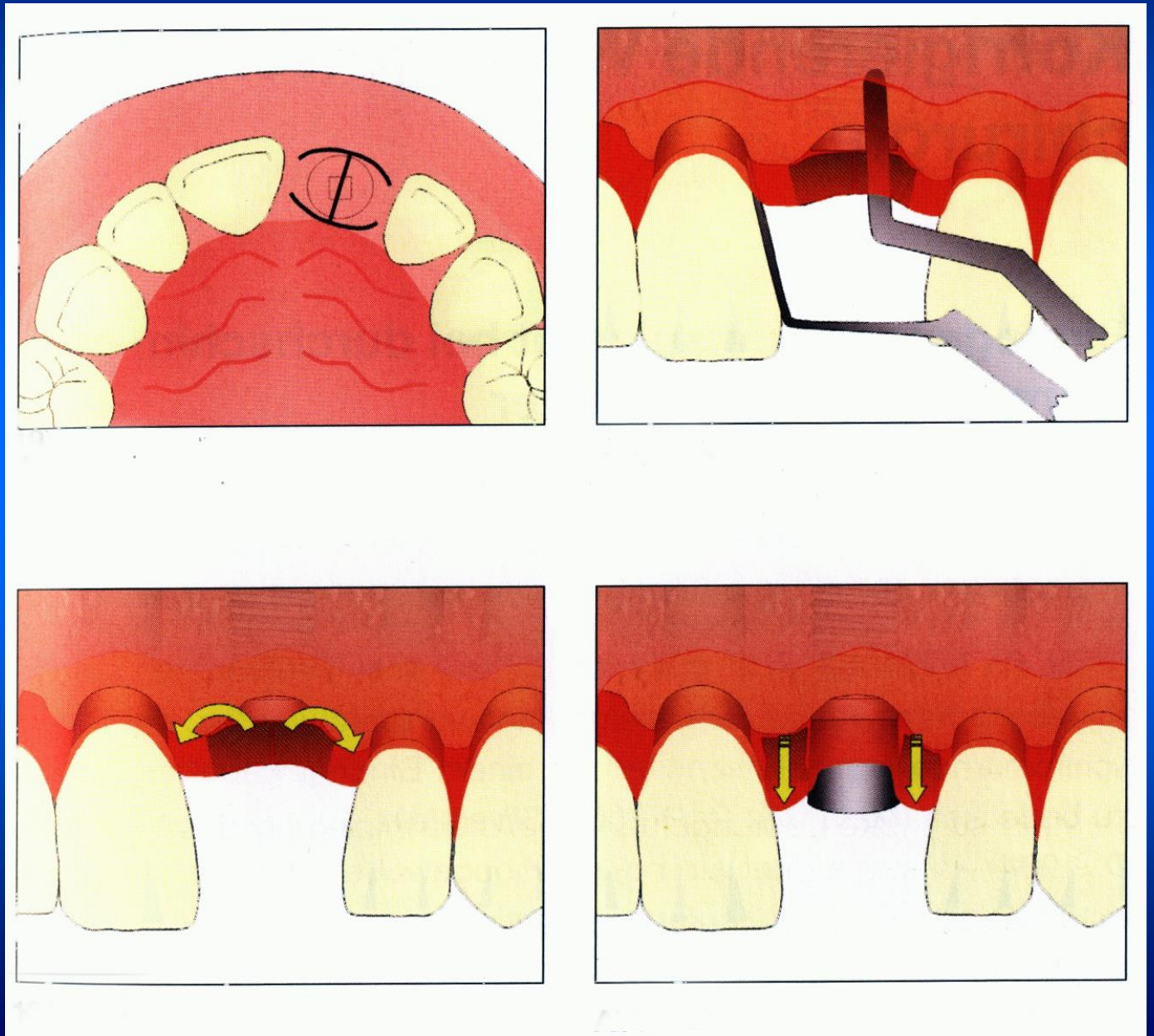
/ Haessler ,Kornmann 1998 ,Misch 2004 / I.Figure



Opening of the implant with reconstruction of the papilla. II.Figure
„Split finger”technique

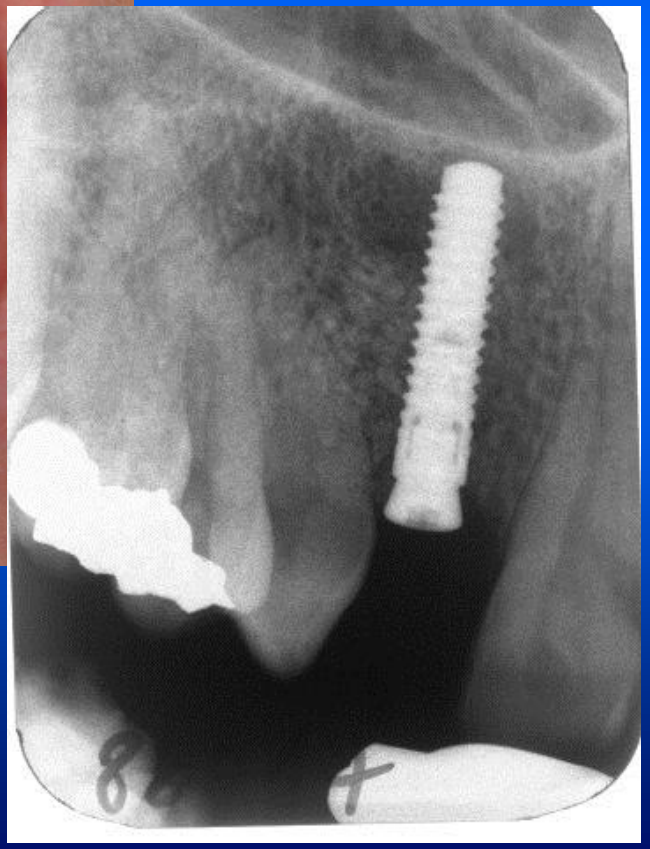


Papilla reconstruction with H-shape flap /Hahn et al.2005, Shahidi et al.2008/

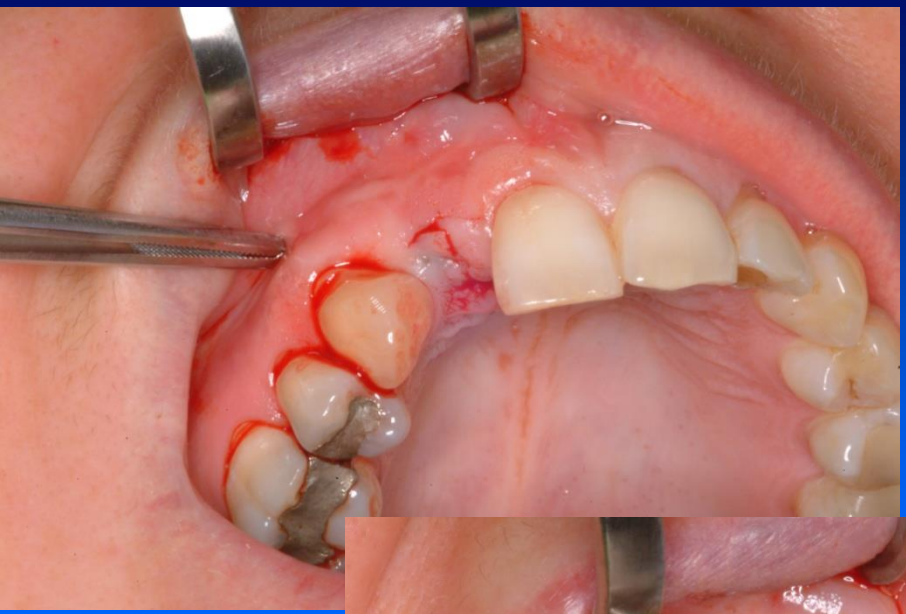


Upper lateral incisor before removal

Placed and healed implant

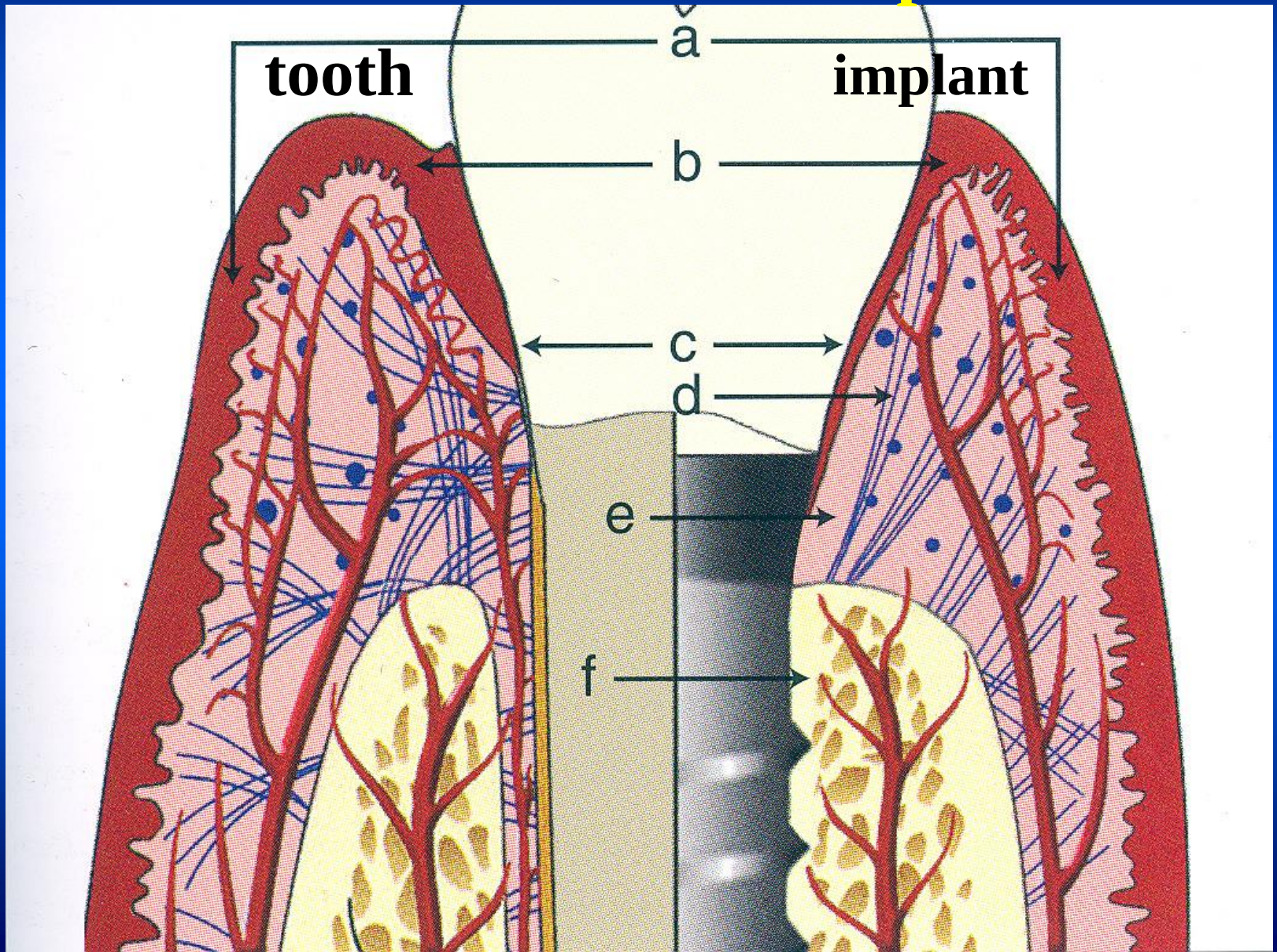


Gingiva forming by H-shape flap

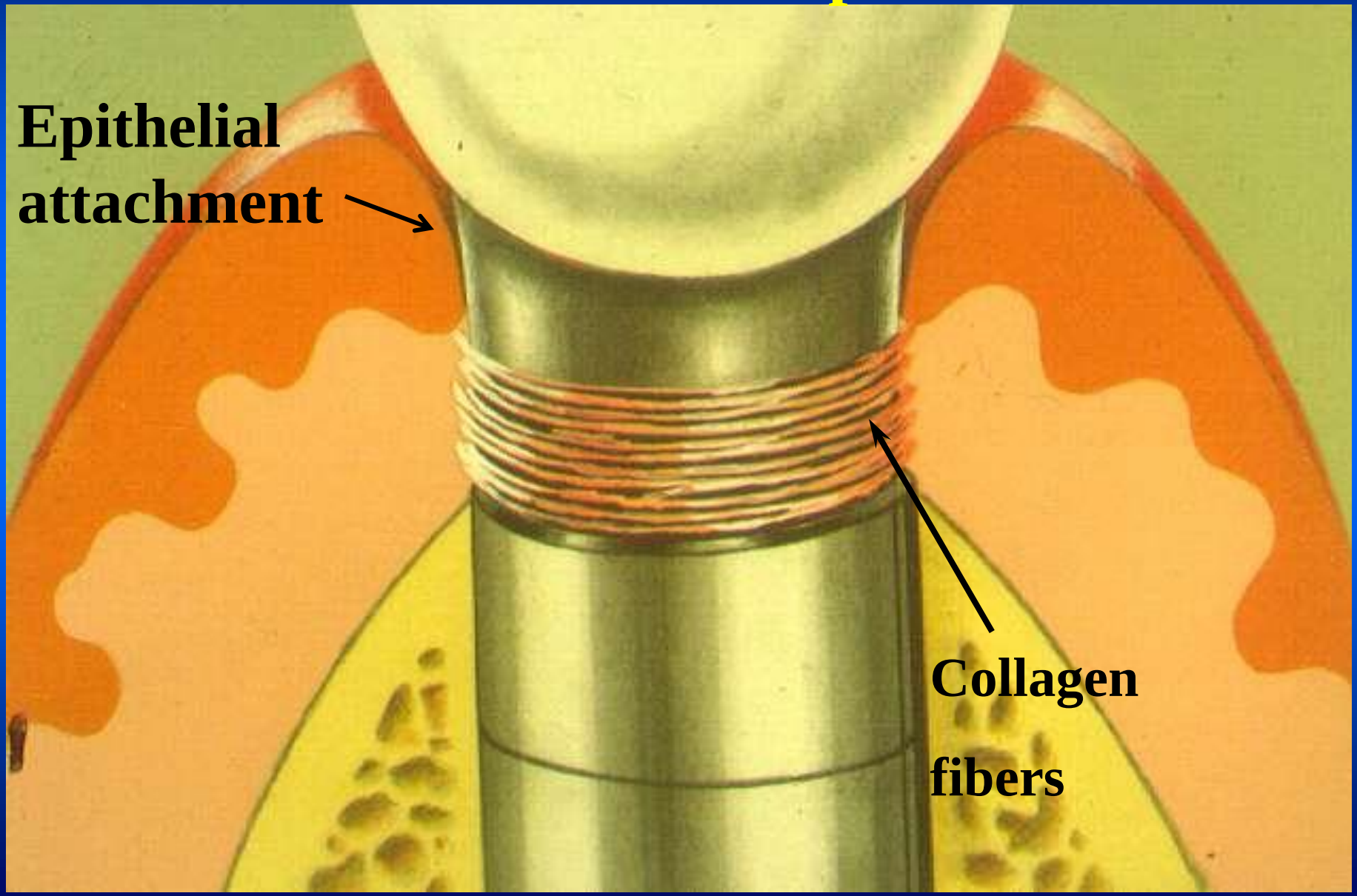


Abutment frased and ceramic crown completed

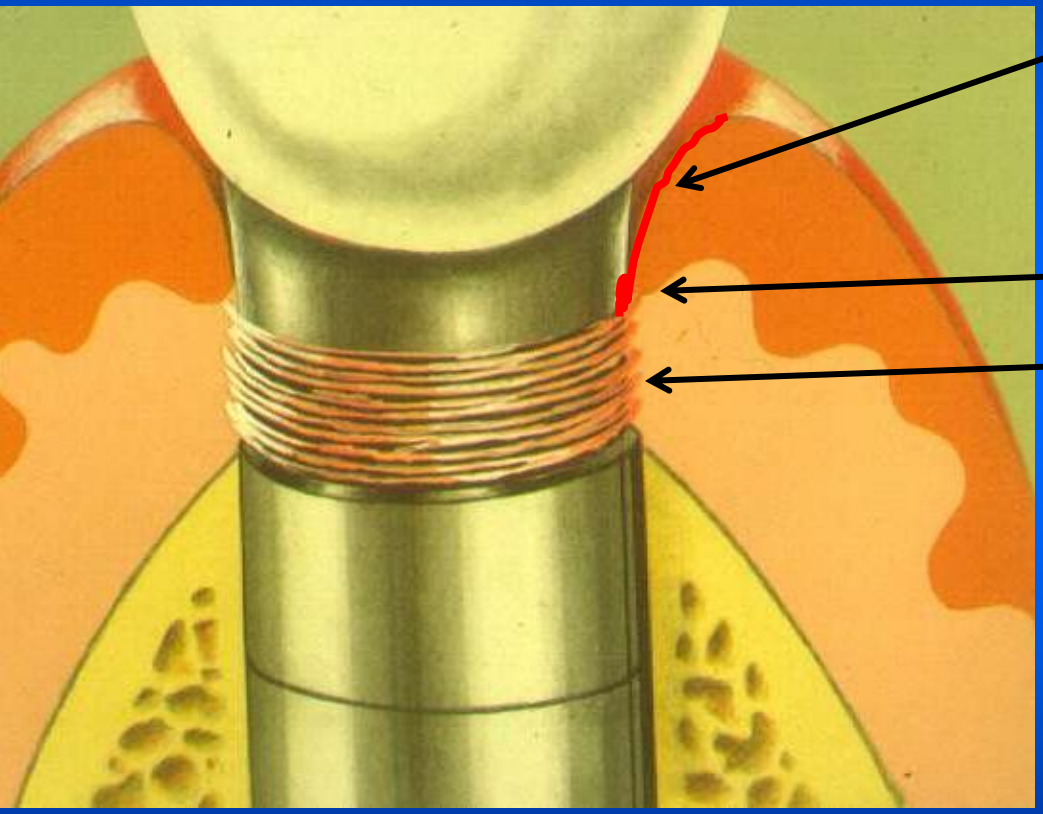
Comparison of gingival seal around tooth and implant



Schematic illustration of the gingival seal around oral implant



The morhology of gingival seal around implant



Junctional epithel,

Provide the defense mechanism for peri-implant tissues

Basal lamina

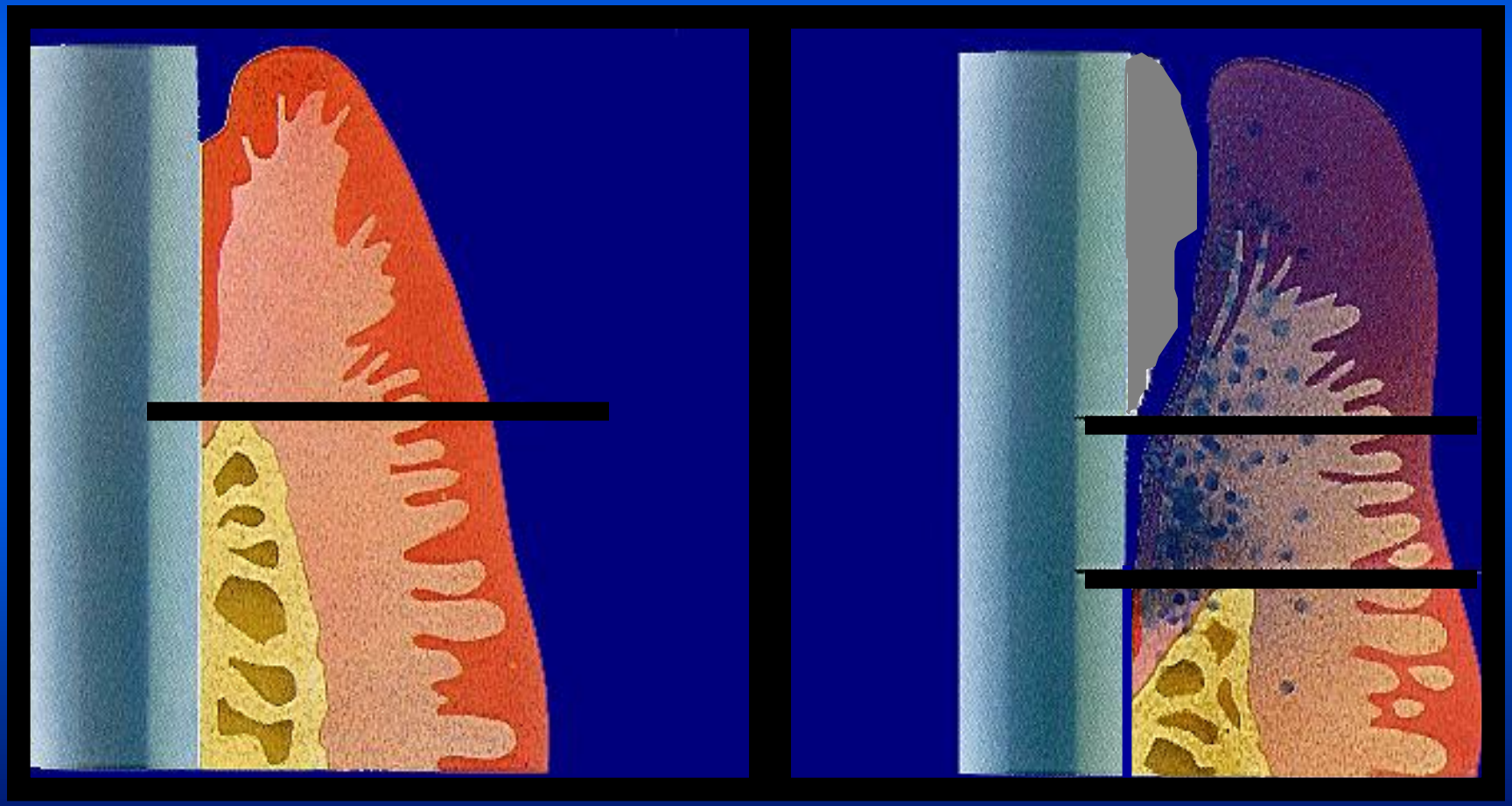
Part of the junctional epithel, adheres to the implant surface by numerous hemidesmosames

Connective tissue seal,

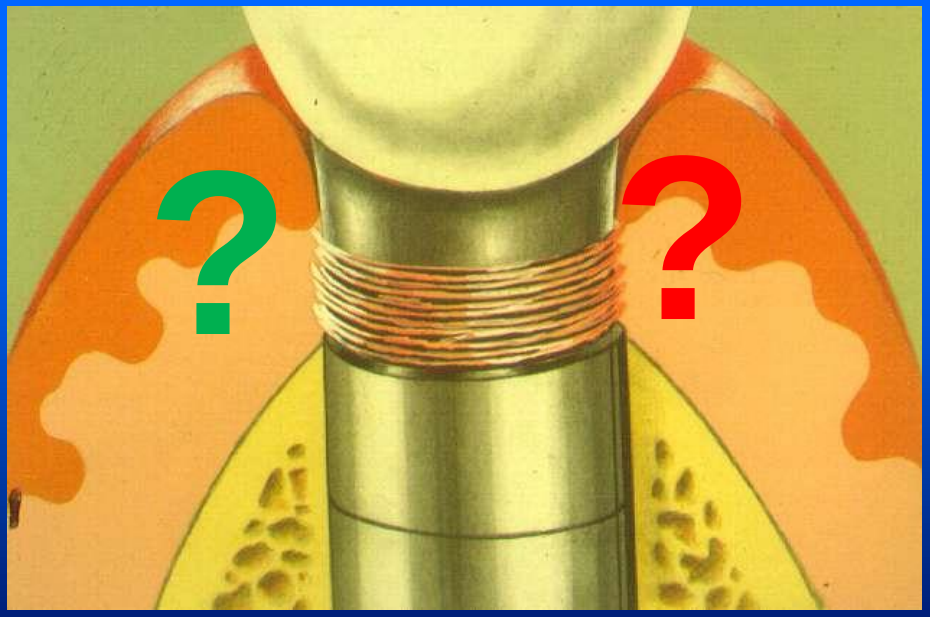
Collagen fibers ,running a course parallel /*machined surface/* or directed toward the implant surface /*microtextured surface/.*

Provides the stability of peri-implant mucosa

HEALTHY AND DISEASED GINGIVAL SEAL AROUND AN IMPLANT



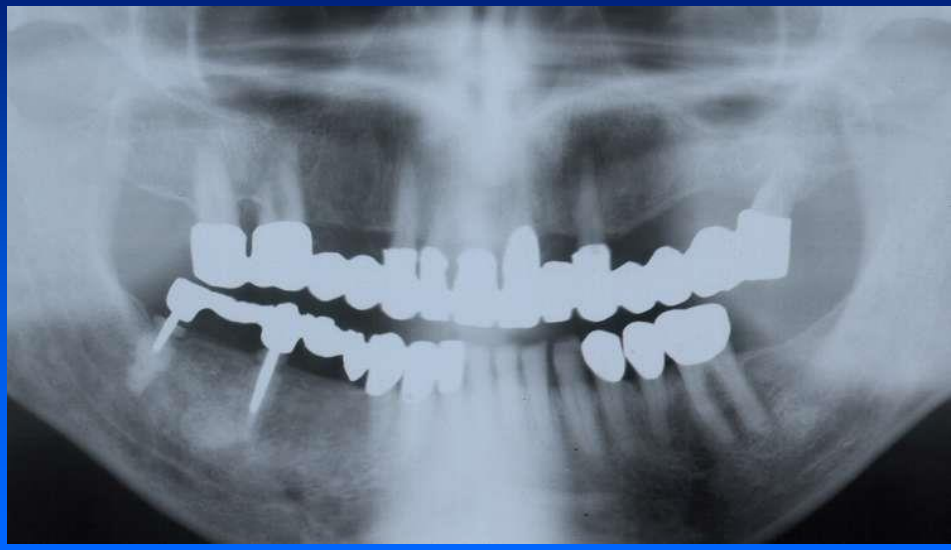
What about the effectiveness of the gingival seal around implants?



Case report

04.1985.

12.1985.



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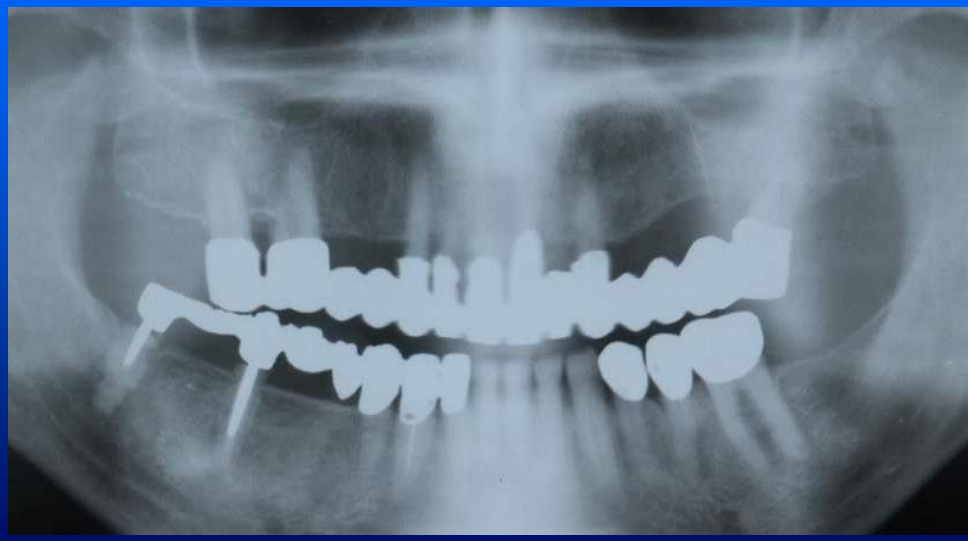
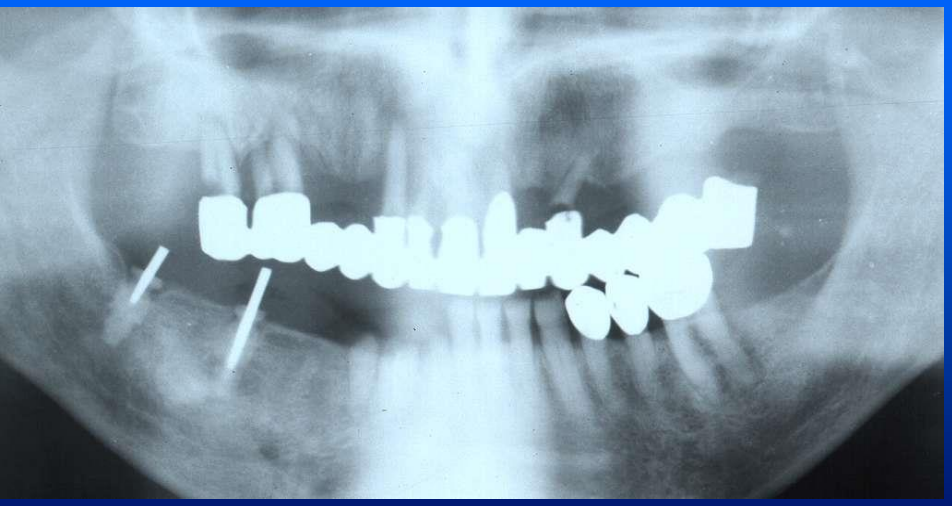


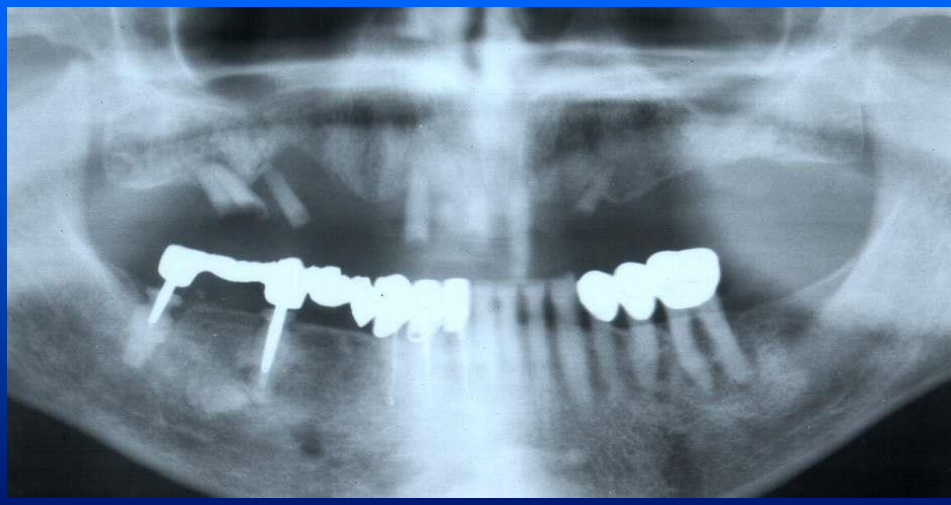
05.1989.

10.1990.

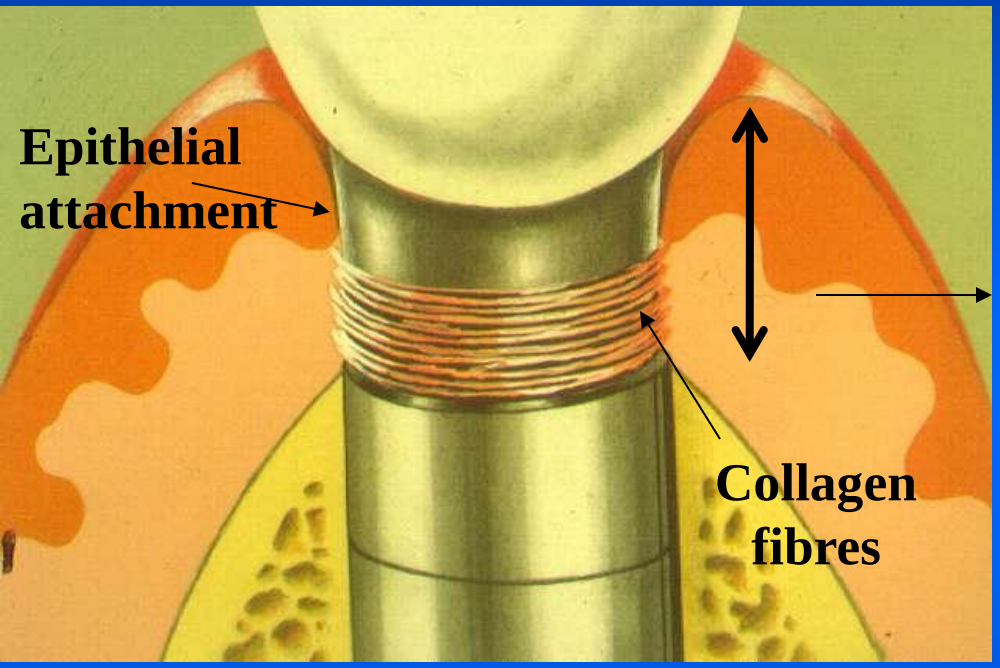
04.1992.



01.1993.



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

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/

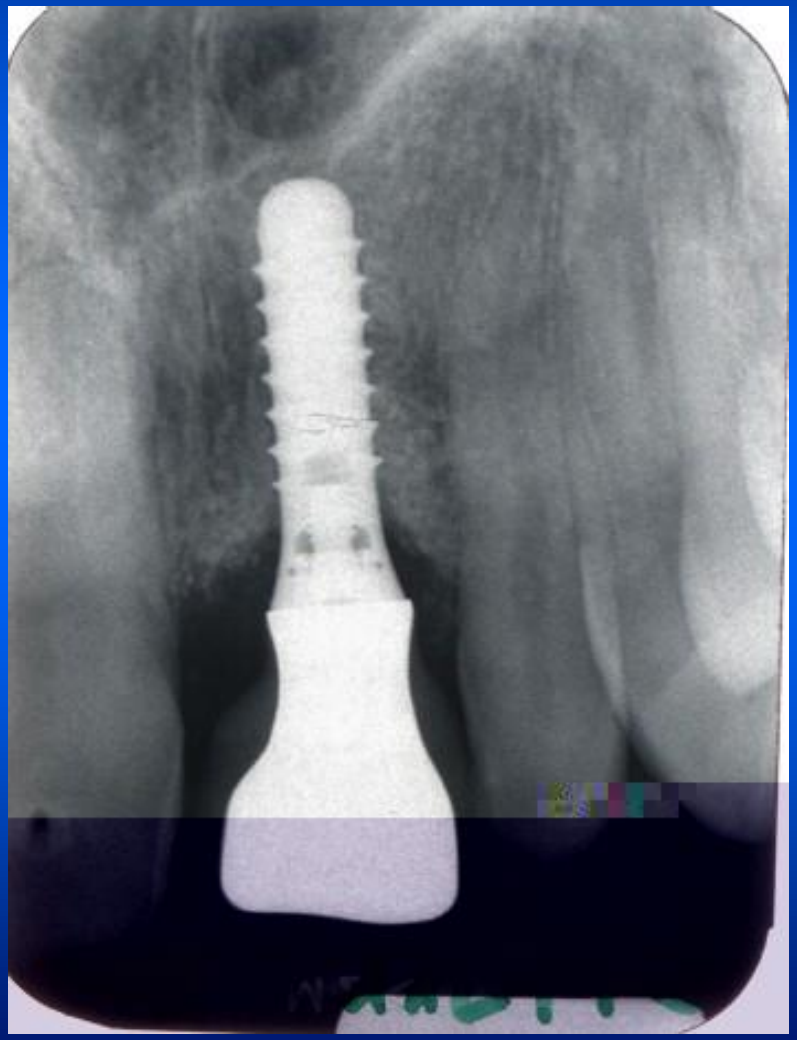
~ 3.0. mm

A study of the formation of biologic width:

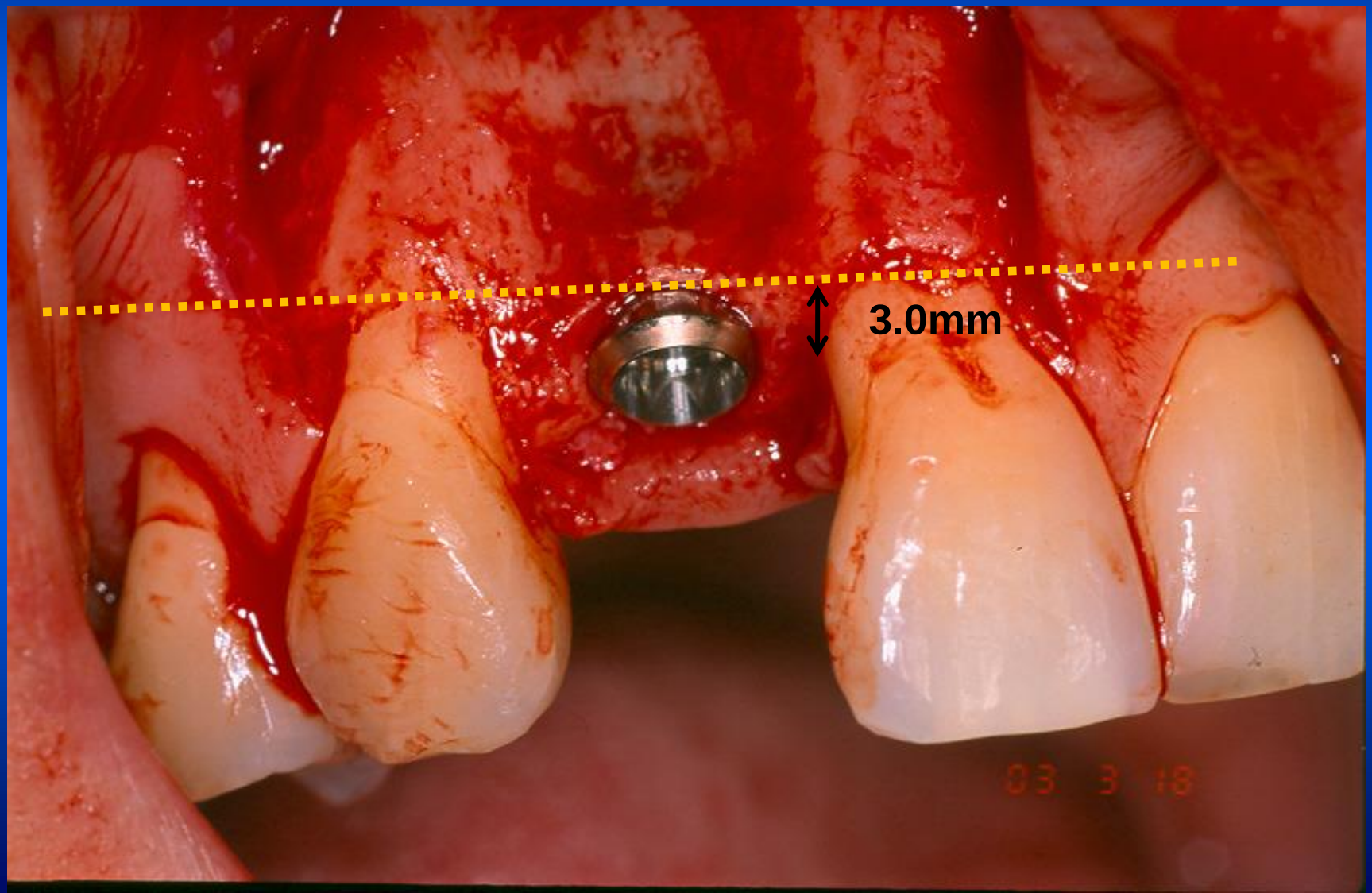
the width of 3.0 mms forms around an implant placed into bone level even through bone resorption.

/Berghlundh T., Lindhe J. animal studies, 1996./

V-formed marginal bone loss around implant



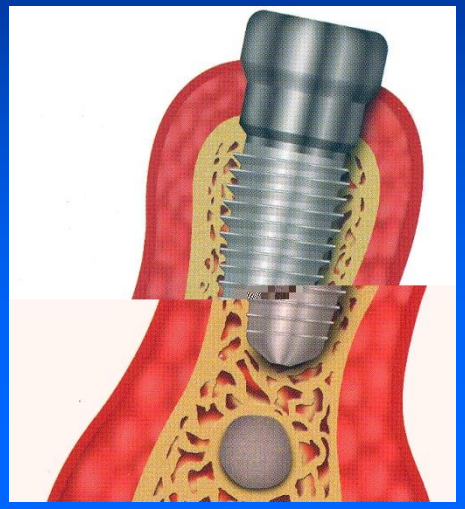
Considering the biological width, the dictance recommended between the submerged implant and the cemento-enamel junction of neighbouring teeth is 3.0 mm.



Surgical protocols can be:

- **One-Stage**

  Transgingival implant healing.

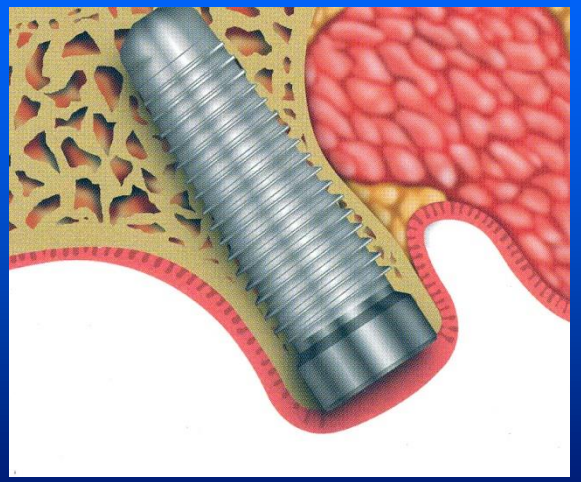


?

- **Two-Stage**

  I. **Implant placement, submerged healing.**

  II. **Exposing and forming of gingiva.Abutment connection.**



The clinical importance of biologic width:

Is transgingival healing better than submerged one?

One- stage or two- stage surgical protocol?

The effect of implant loading on the bone

Stages of peri-implant endosseous healing

/John E.Davies:J.Dent.Educ.67.2003/

- Osteoconduction- Migration of osteogenic cells to the implant surface
- de novo bone formation /modeling/
- **Bone remodeling**

Facts of the biology of bone remodeling

- „ Form follows function”. Trabecular bone will place or displace itself from fuctional pressures

/Wolff 1892, Roux 1895/

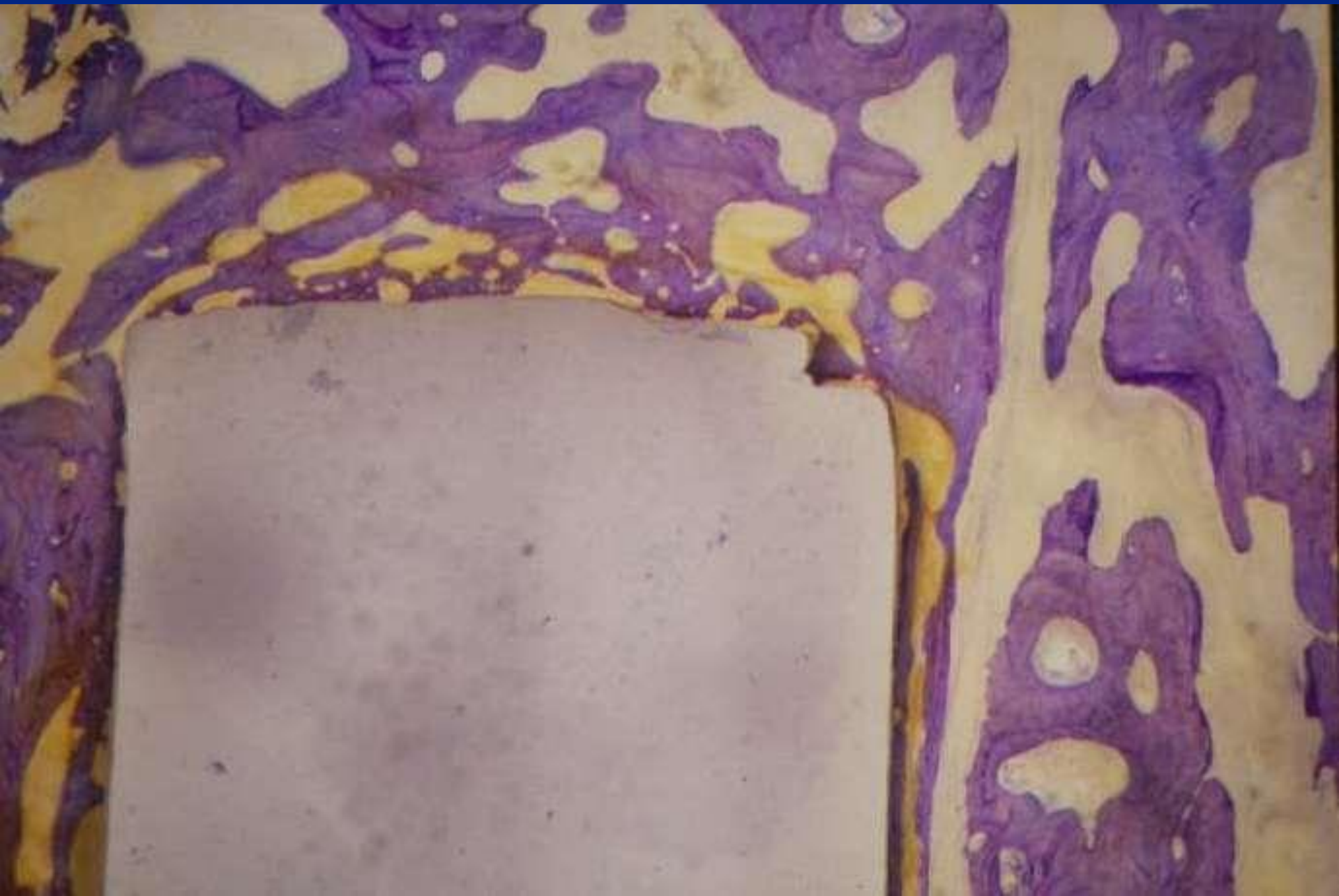
- Osteocytes sense mechanical stimuli and regulate the osteoblastic activity.

/Cowin 2007,Rubin et al.2006,Taylor et al.2007/

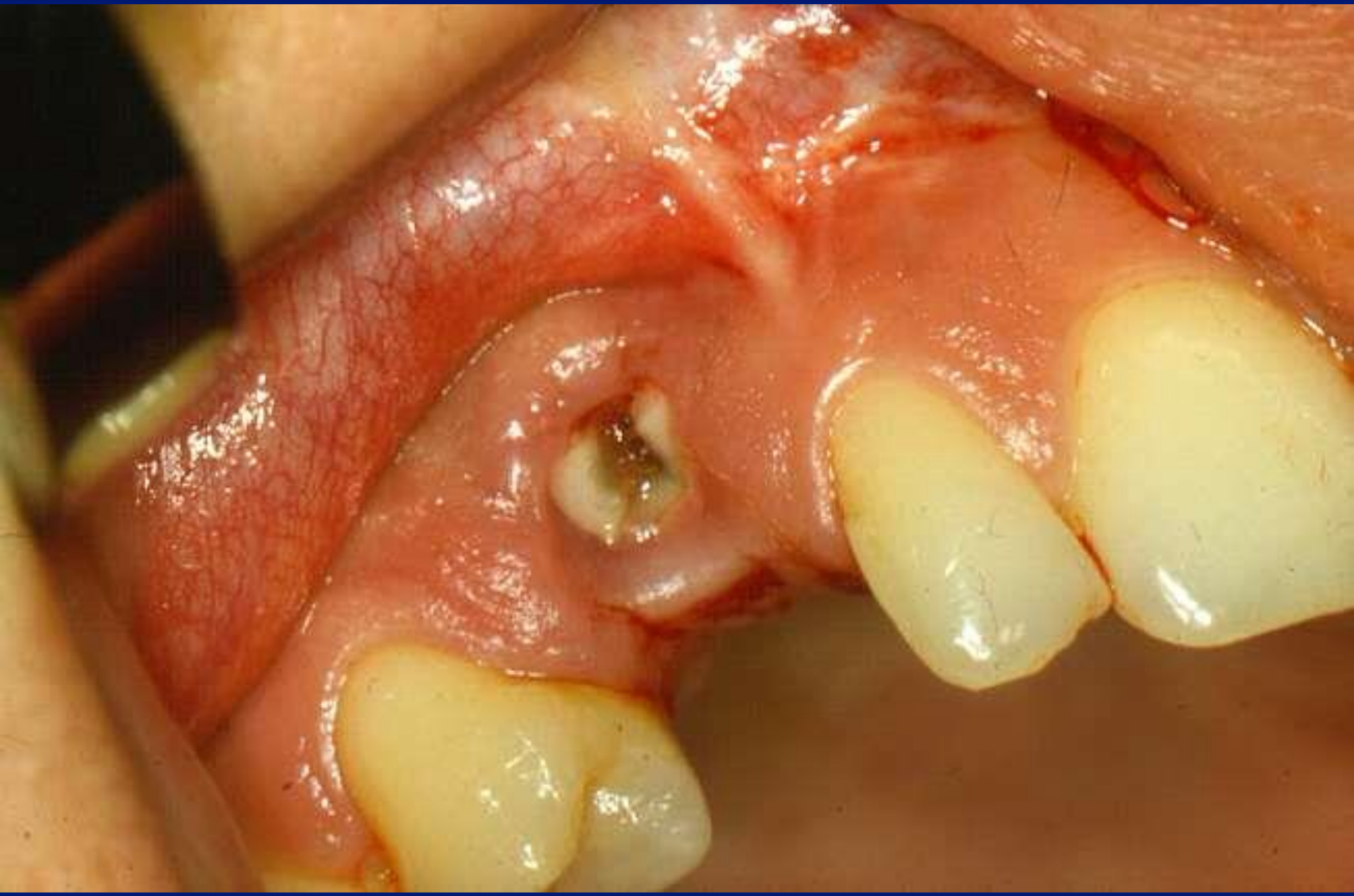
- Dynamic loading has more osteogenic potential, then static one./Akuz et al.2006/

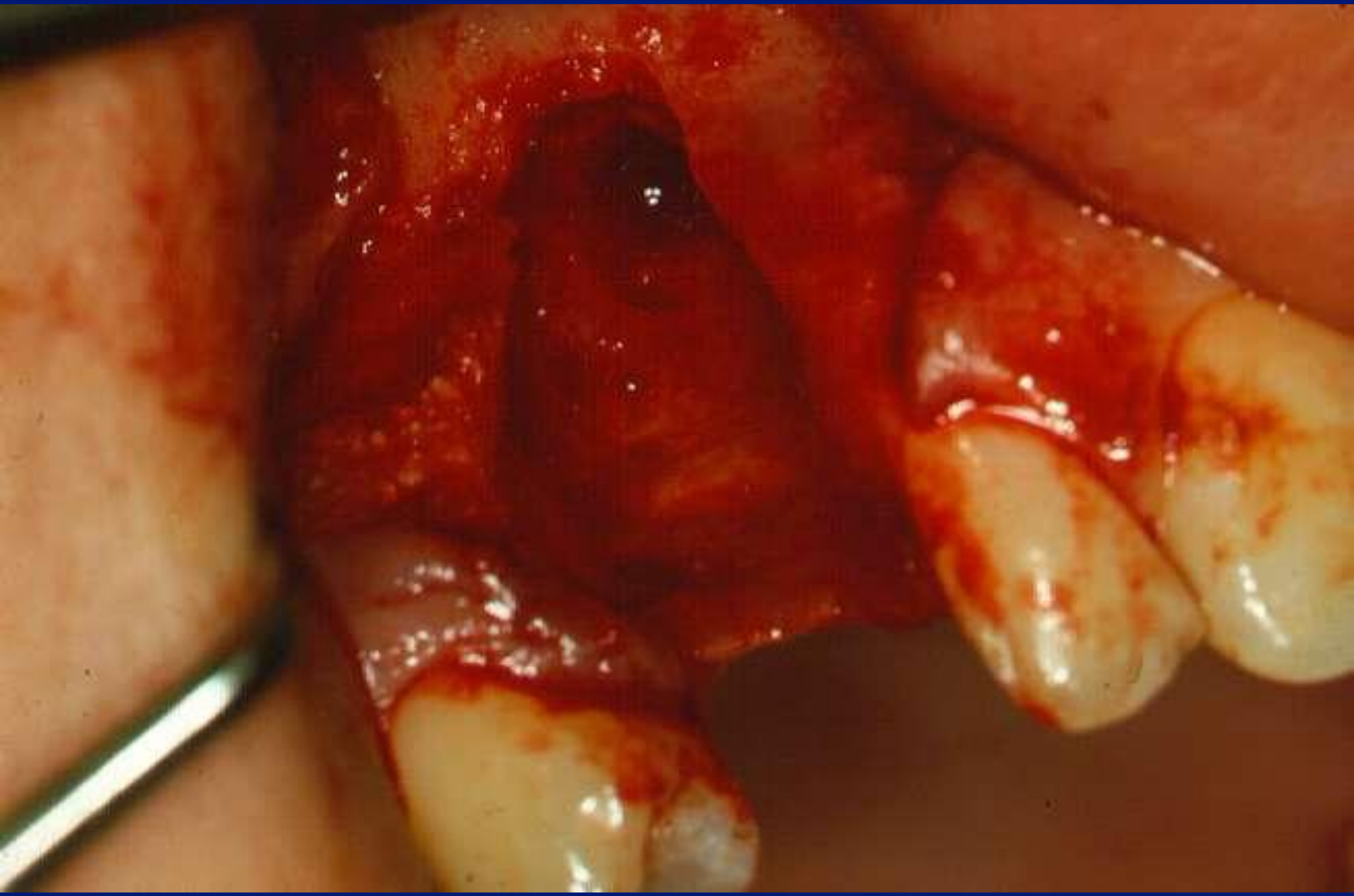
- Bone remodeling depends on the morphology of bone, and the direction, magnitude,duration of loading. /Numerous literature data/

Bone-implant contact /BIC/

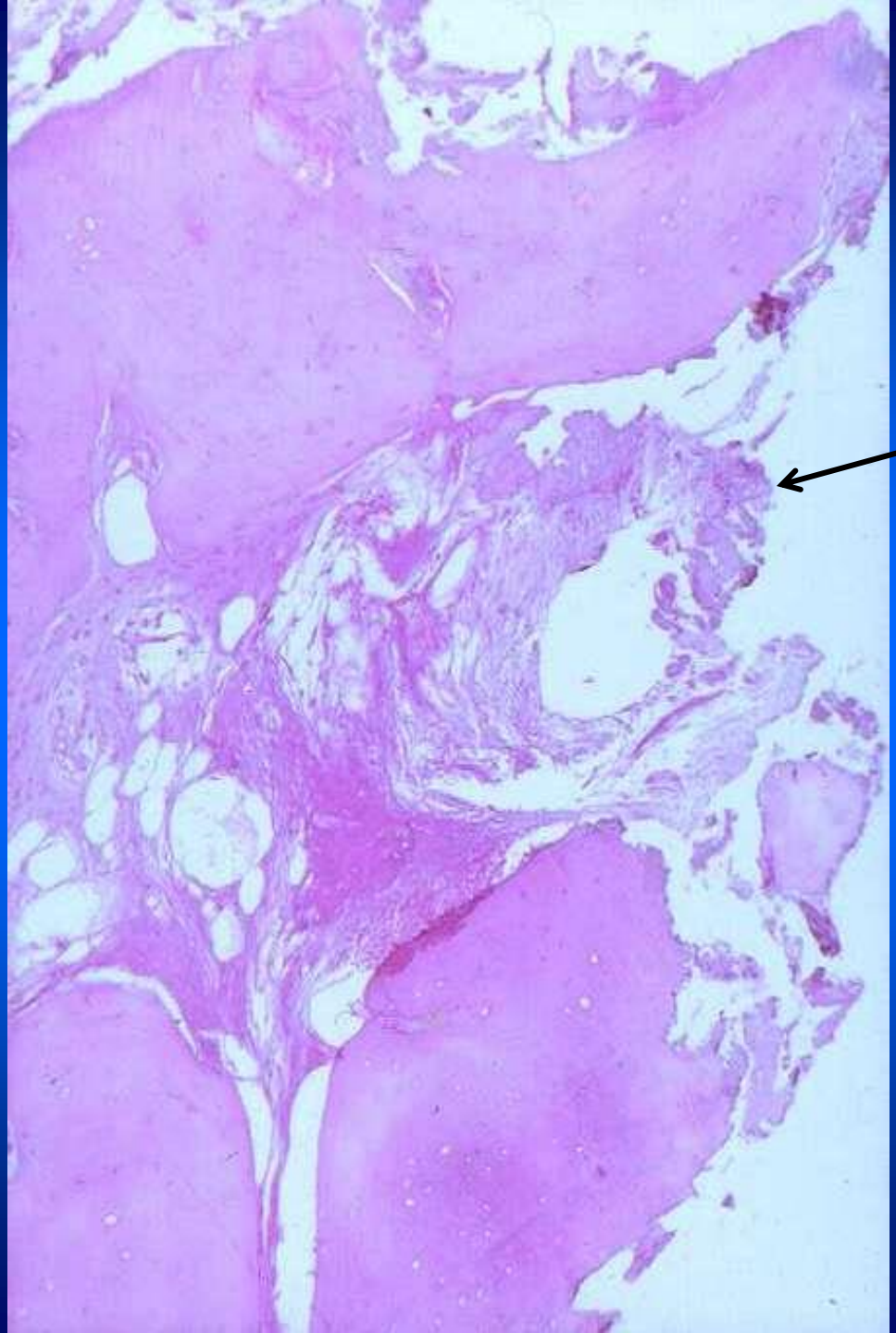


Case presentation



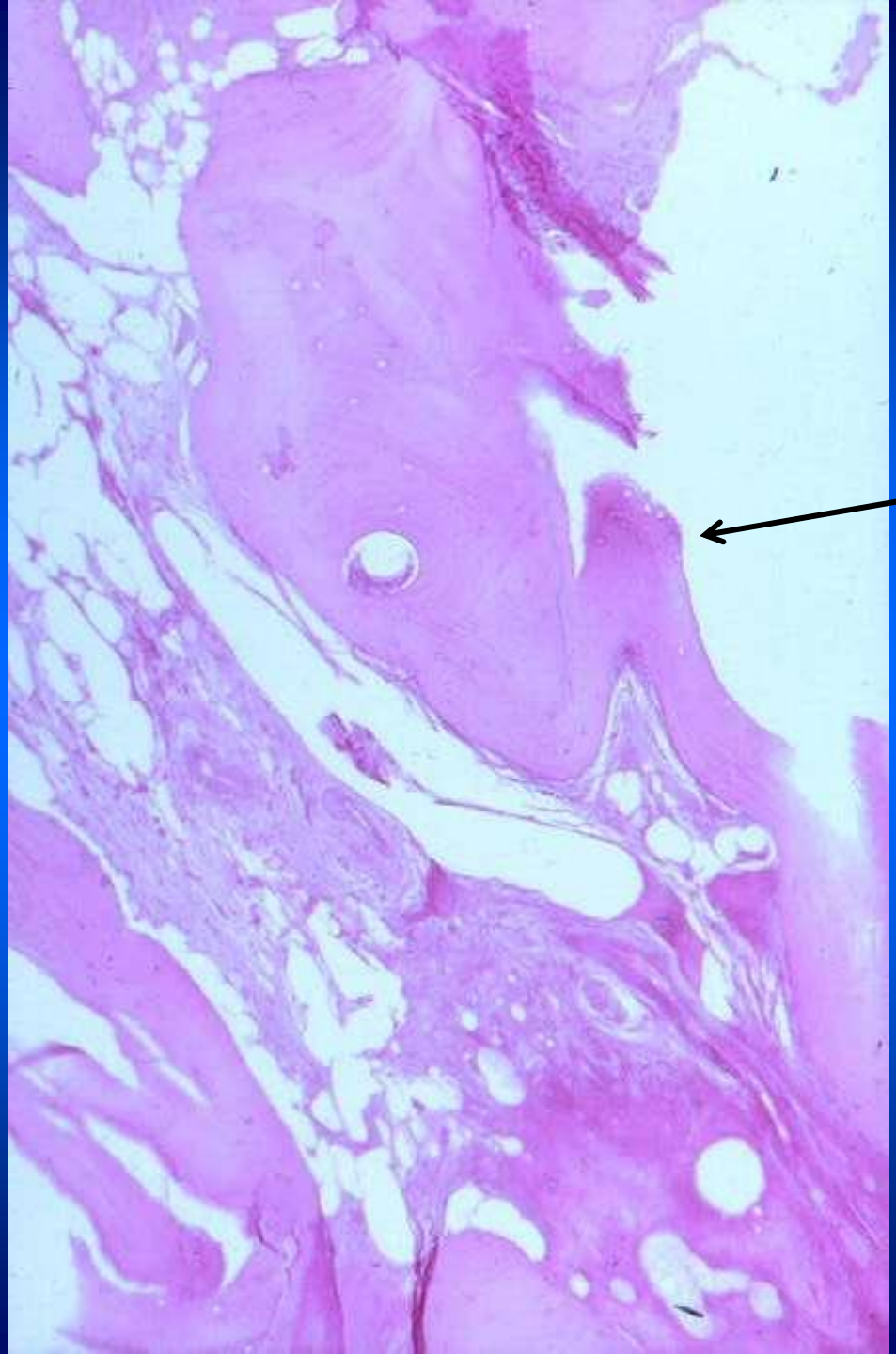



Bone specimen
has been
removed
from the
surface
and
histologically
investigated



Implantátum

Open medullary spaces



Implantátum

Closed, „corticalized” interface

PROGRESSIVE OSSEOINTEGRATION

The bone-implant contact increases by the physiological remodeling of bone

In the case of proper loading, the degree of bone-implant contact increases from 53% to 74% by the end of the first year, following insertion.

/Gottlander M., Albrektsson T.: Int. J. Oral Maxillofac. Impl. 1991; 6: 399-404/

The clinical significance of progressive osseointegration:

- the bone becomes more mature due to the proper loading
- the implant placed, inhibits the atrophy of the edentulous alveolar ridge around

Conditions of the long term maintenance of osseointegration

- Optimal gingival seal
- Optimal transmission of masticatory forces