

Clinical indications for bone substitution materials in dentistry

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Radboudumc

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- I do not receive sponsoring of companies for this presentation
- All clinical pictures are original and not manipulated with PhotoShop or other software
- All recognizable clinical pictures are left out of the hand-outs due to privacy rules and legislation

Program

- Background
- Oral Implantology and bone substitution
- Clinical application 1: sinus floor elevation
- Clinical application 2: buccal contour augmentation
- Summary and take-home messages

Background

- Dentistry, Radboudumc Nijmegen (2005)
- General practice
- PhD project on Biomaterials on bone substitution with calcium phosphate cements (2013)
- Dentist-implantologist and dentist-prosthodontist (private practice and university)
- Clinical teacher
- Present: Full-time employment within the Radboudumc:
 - Clinical teaching (0.1 fte)
 - Assistant professor at the dept. of Biomaterials (0.4 fte)
 - Clinical implantology and prosthodontics (0.5 fte)

Radboud university medical center



Radboudumc

New dentistry building



8817 Nijmegen Tandheelkunde - DC stand van zaken voor wetsland - foto 12 december 2013

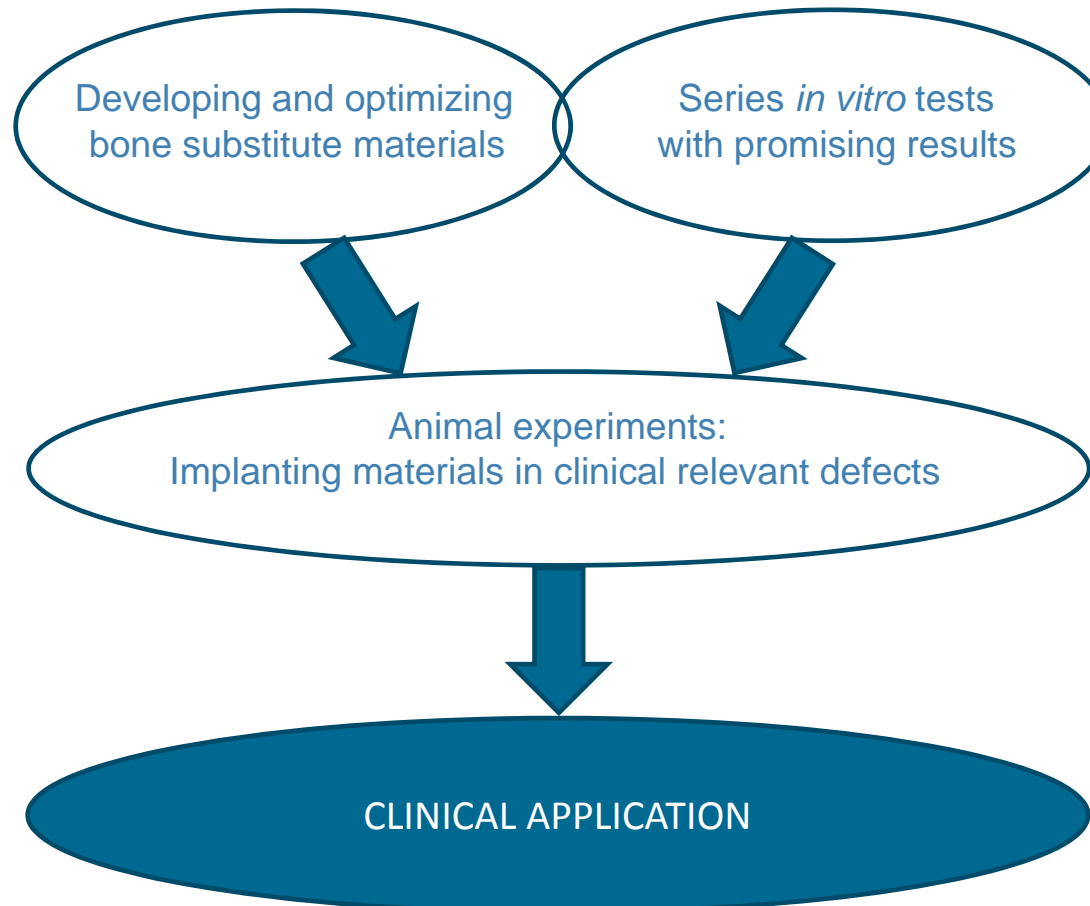
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Background of the Department of Biomaterials

- 1 Head: Professor doctor John Jansen
- 7 Staff members (assistant professors)
- ± 25 PhD students
- 5 Analysts
- Collaborations with Saudi-Arabia, China, United States, Singapore, ...
- Bone substitutes, periodontal regeneration, implant surface modifications and stem cells.

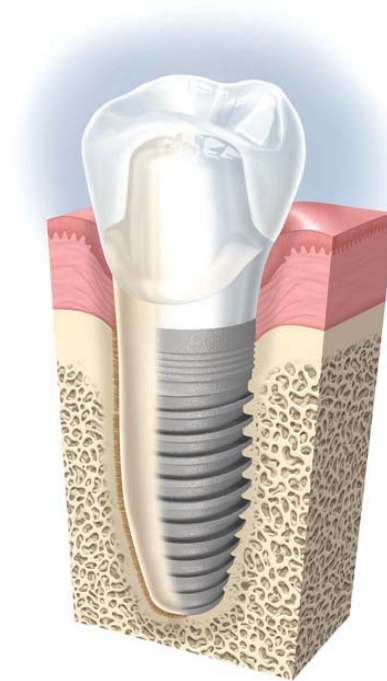
‘From bench to bed’

From bench to bed



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Oral implantology and bone substitution

- Movie

Oral implantology and bone substitution

Clinical picture

Oral implantology and bone substitution

- Adequate bone quantity is needed
- Adequate bone quality is needed
- Large amounts → maxillofacial surgery → autologous bone
- Small amounts → dentist-implantologists → synthetic grafts or xenografts

Difference between autologous and synthetic?



- Autologous bone is still the gold standard in extensive bone regeneration cases
- Disadvantages of autologous bone:
 - Limited availability
 - Donor site morbidity
 - Second surgical site
 - Risk of complications
 - Prolonged hospitalization
 - Increased costs

Difference between autologous and synthetic?

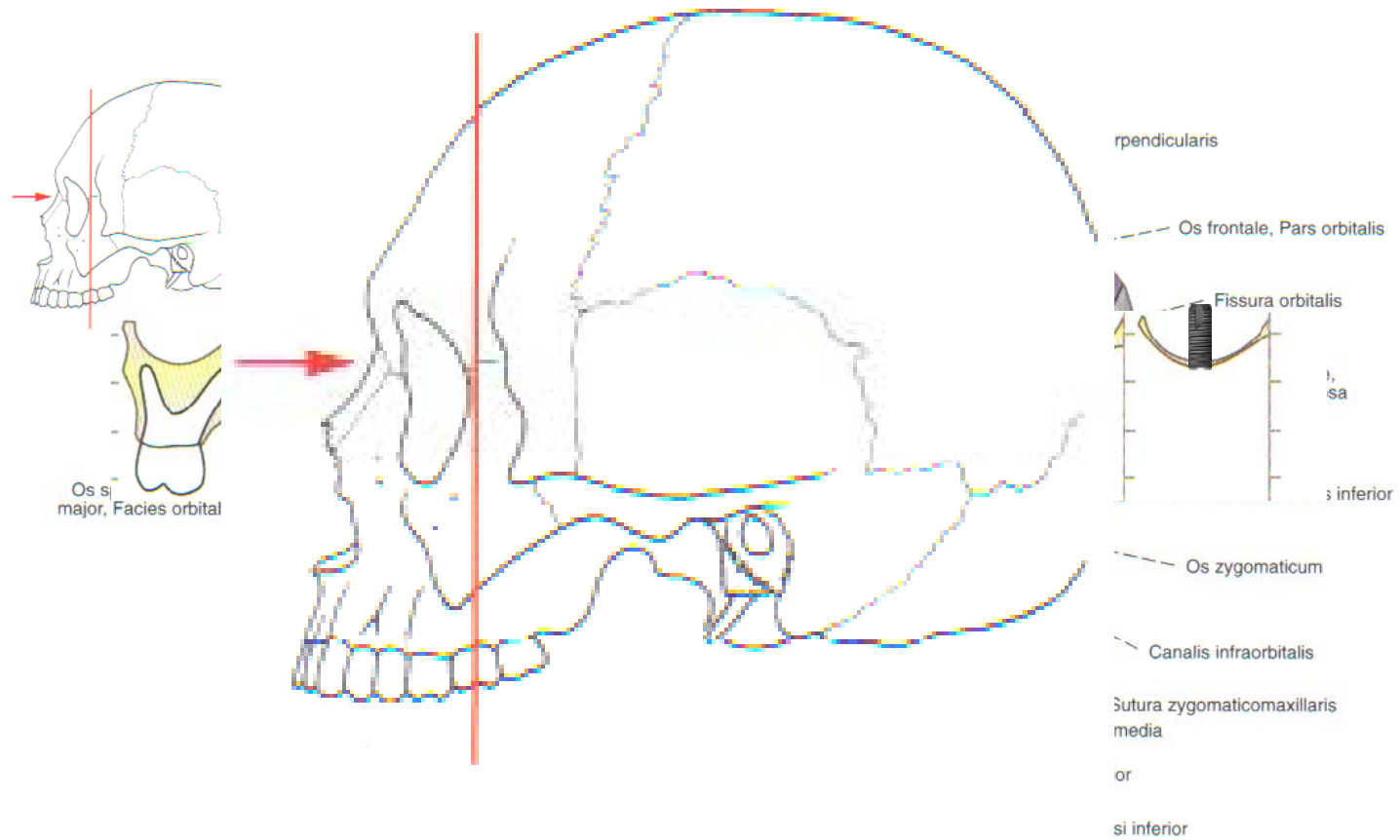


- Truedsson et al. Clin Oral Impl Res 2013;24:1088:
- Mean hospital costs: € 3447,-
- Synthetic alternative: 42% reduction!
- Recovery time: 14 days
- **We use alternatives whenever possible!**

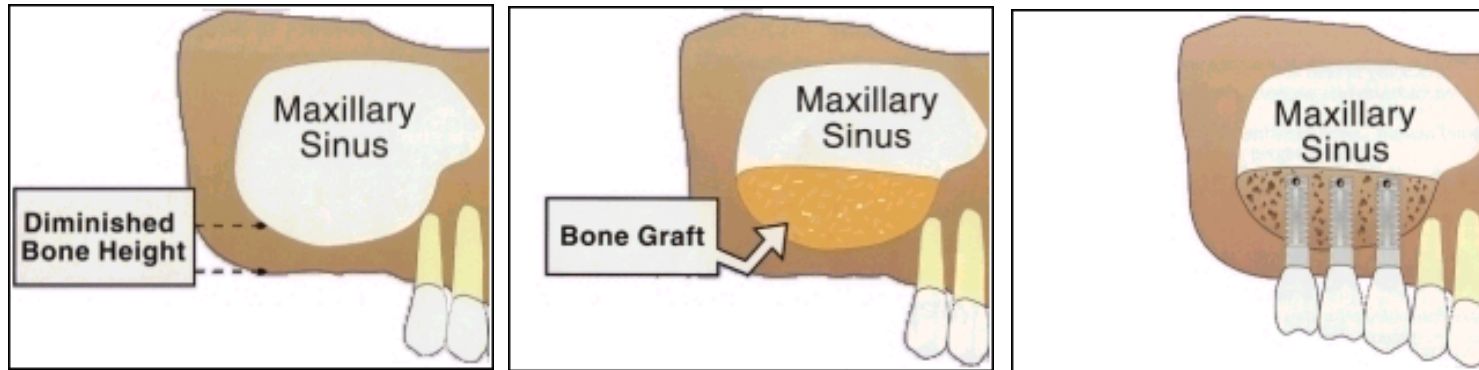
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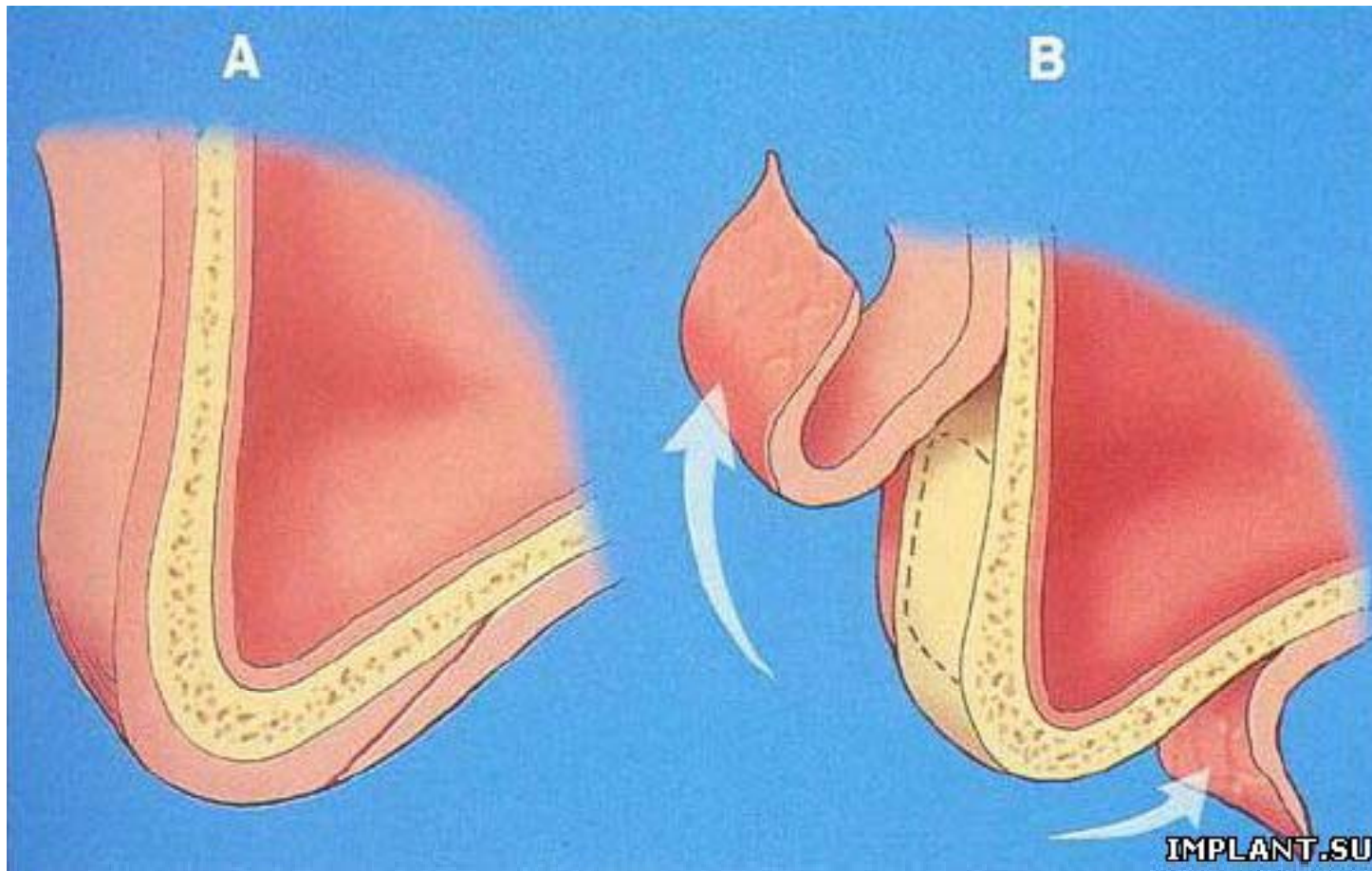
Clinical application 1: Sinus floor elevation



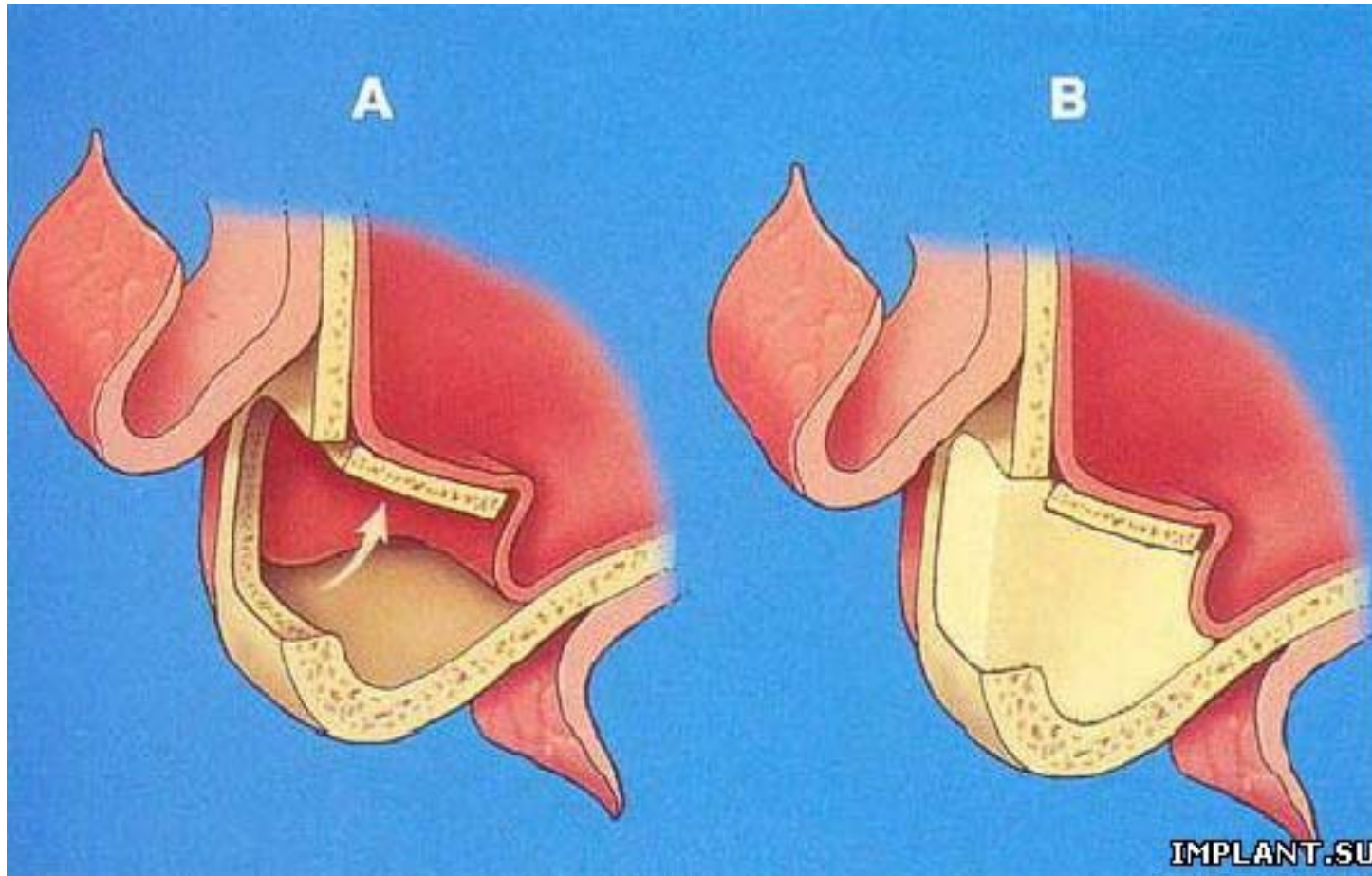
Clinical application 1: Sinus floor elevation



Clinical application 1: Sinus floor elevation



Clinical application 1: Sinus floor elevation



Clinical application 1: Sinus floor elevation

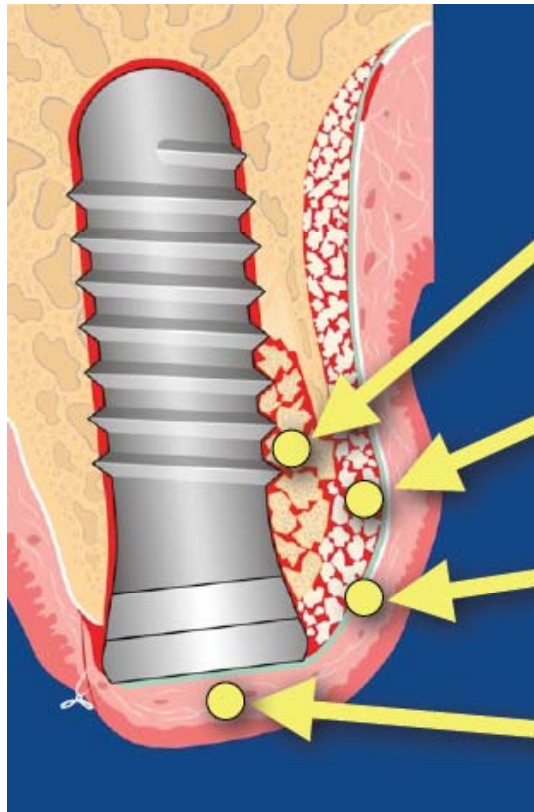
Clinical pictures and movies

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- **Clinical application 2: buccal contour augmentation**
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Clinical application 2: Buccal contour augmentation

Principle of the procedure



Autologous bone particles in direct contact with the implant

HA bone substitute (Bio-Oss)

Resorbable membrane (Bio-Gide)

Primary tension-free closure (Gore-Tex)

Clinical application 2: Buccal contour augmentation

Clinical pictures

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Summary

- Adequate bone quality and quantity is needed for oral implantology
- Autologous bone is still the gold standard, but has serious disadvantages
- We use granules in all sorts and forms as an alternative, but this has also limitations

What do we need from research?

- More ease of handling of the materials
- Bulk application of the materials
- Dimensionally stable materials
- **CEMENT!**

Injectable cement

- Movie

Take-home messages

- Autologous bone has serious disadvantages
- Develop an injectable and degradable cement
- Brush your teeth

We need implants!

- Movie

Thank you for your attention!

