Retrospective analyses of patients with one or more implant-retained partial fixed dental prostheses

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BACKGROUND AND RATIONALE

This retrospective study assess outcomes after >10 years observation period of titanium implants predominantly with a machined surface (Brånemark) in a cohort of partially edentate patients treated at the University of Toronto. The study protocol is a replication of a current ongoing clinical study evaluating the outcomes of implants with a sandblasted and acid-etched surface (Straumann SLA) conducted at the University of Bern, Switzerland (Buser et al. 2012).

STUDY OBJECTIVE

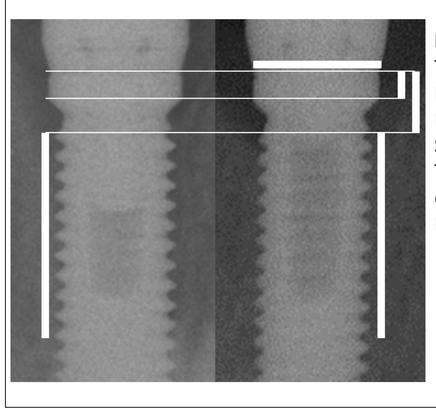
To use identical evaluation criteria to contrast clinical outcomes achieved in two patient cohorts subjected to different management and treatment approach philosophies. We present a part of the ongoing study, detailing some outcomes of partially dentate patients having been restored by Brånemark system implant-retained crowns and bridges in our graduate prosthodontic clinic.

MATERIALS AND METHODS

- The study protocol was approved by the UofT Research Ethics Board, REB Approval #25207
- All patients who received at least one implant in a partially edentate jaw before 2002 were eligible to be included in the study (n = 298).
- Invitation letters for study participation were sent to all patients, followed up by a telephone call .
- All patients gave written informed consent after being informed in detail about the objectives of the study.
- All patients underwent a clinical and radiological examination and completed a satisfaction questionnaire
- Several clinical and radiographic parameters were assessed (Mombelli et al. 1987):
  - Presence or absence of peri-implant suppuration and/or fistula
  - *Modified Plaque Index* at six sites around the implant
  - *Modified Sulcus Bleeding Index* at six sites around the implant
  - *Probing Depth* measured with a periodontal probe to the nearest millimeter at six sites around the implant measured from

• Biological/Technical complications were identified from the patient records and/or solicited from their private dentists.

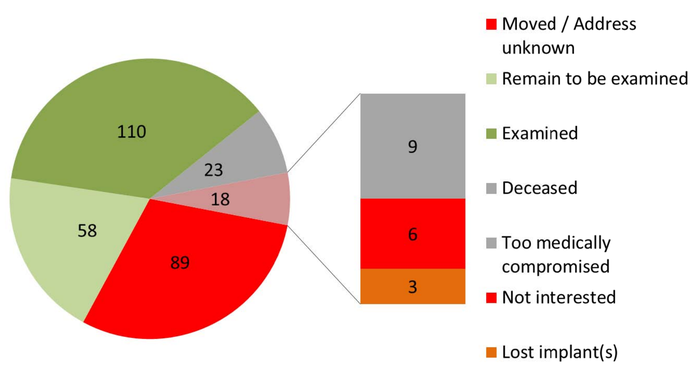
• Periapical radiographs were taken by experienced examiners using the long cone technique
• The distance from the implant shoulder to the first bone-to-implant contact on the mesial and distal aspects was averaged for each implant



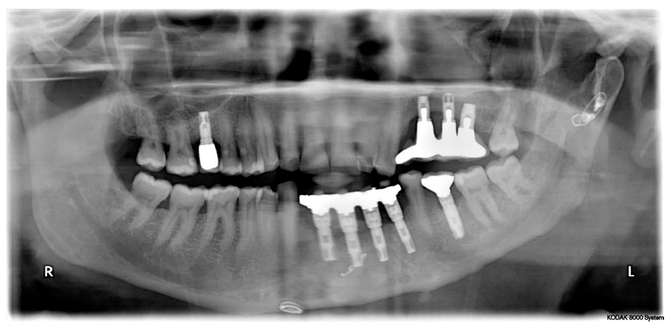
Brånemark System Implant (ø=3.75 mm)
Top of shoulder to:
Horizontal part of the shoulder = 0.8mm
First thread = 1.8 mm
Second thread = 2.4 mm
Third thread = 3.0 mm
etc.
Inter-thread distances = 0.6 mm

RESULTS

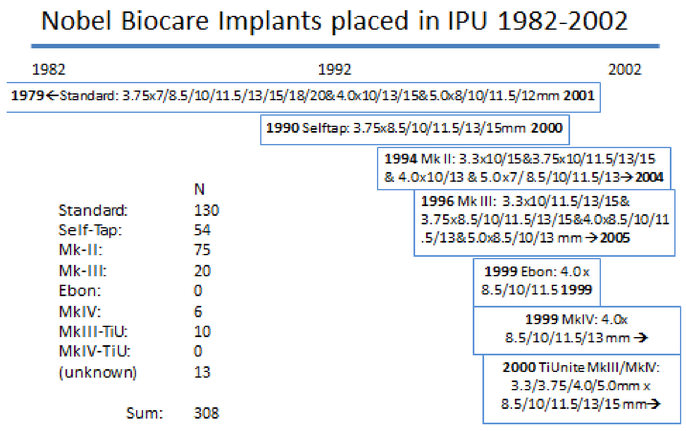
Of the 298 identified patients, currently, 110 patients with 308 implants have been examined clinically and radiologically.



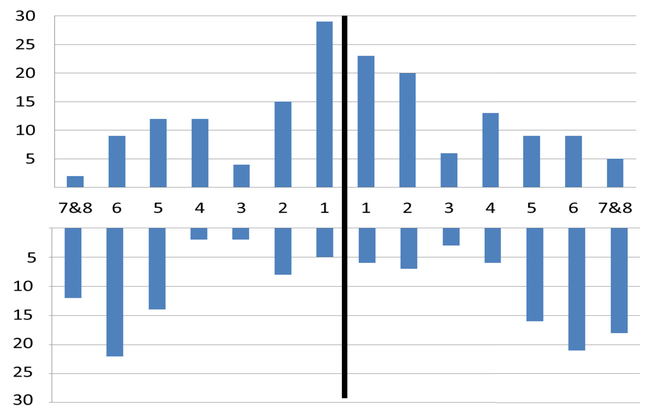
Most participants had one or two single implants (n=56). Two patients had 8 and 9 implants respectively (Compare with radiograph).



The implants in this study were placed between 1983 and 2002 (Hence, Mean & Median observation periods are 15 & 17 years). A range of implant types have been used over these years, predominantly Standard and Mark-II with ø= 3.75mm (n=257) followed by ø=5.0mm (n=34), ø=4.0mm (n=15) and ø=3.3mm(n=2).



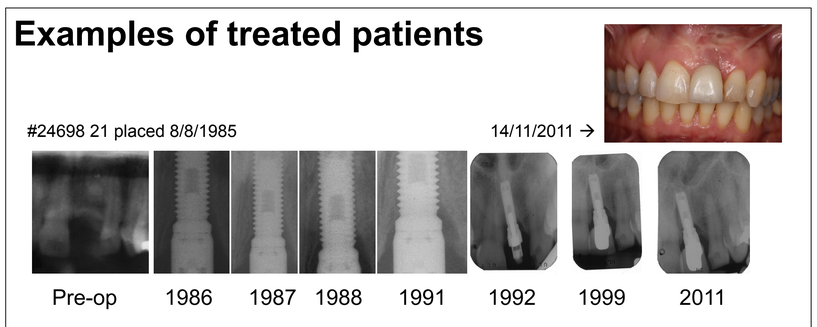
The 308 examined implants were located in all 4 tooth-quadrants with prevailing locations in the maxillary central and mandibular 1st molar regions.

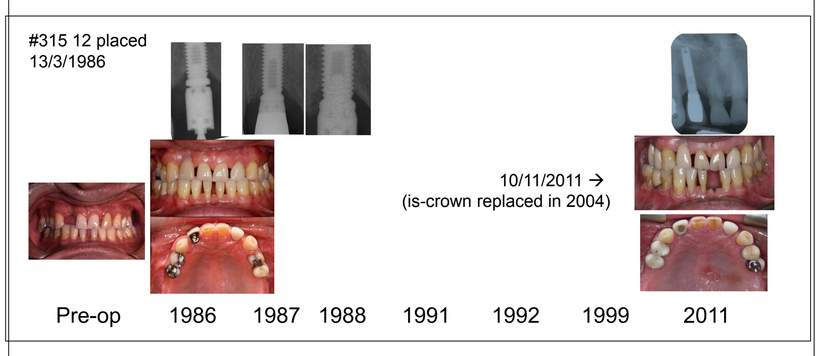


In this patient cohort, only 2 patients obtained grafting and no sinus augmentation procedures were performed.

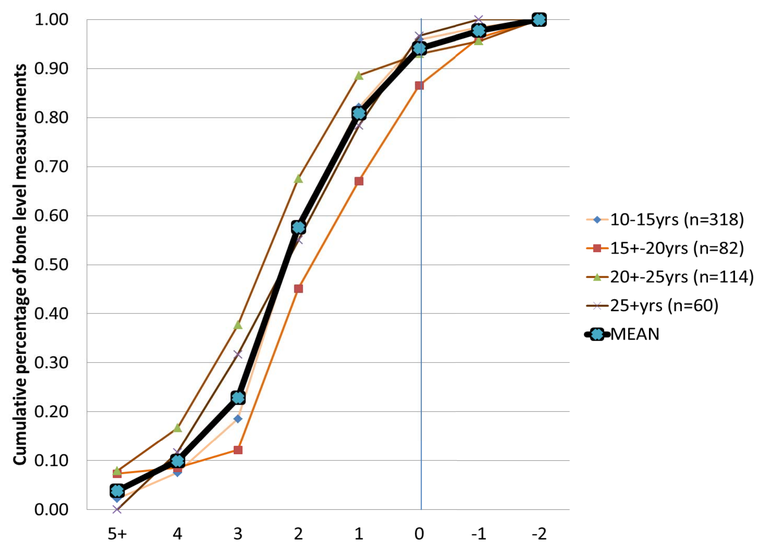
We identified from the patient charts an additional 6 implants that failed to osseointegrate, 3 implants have fractured and 10 more implants have been removed due to other failures before the examination date. These constitute 19 / (308+19) = 5% of all the placed implants in this patient cohort.

Examples of treated patients





The distance from implant shoulder to first bone contact varied between 10 mm to -3 mm (Median = 2.2 mm). (Negative values are likely not “bone gains” but rather reflect countersunk implants at placement with minimal bone loss).



Distances from implant shoulder to first bone contact (mm).

CONCLUSIONS

After an average of 17 years a high proportion of conventional machined Brånemark system implants remain in function (95%). The average distance between the implant shoulder to first bone contact is 2.2 mm.

REFERENCES

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- Mombelli A, et al. The microbiota associated with successful or failing osseointegrated titanium implants. Oral Microbiol Immunol 1987;2:145–51

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