

Immediate provisionalization in the esthetic zone with narrow diameter implants: 5-year results

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Background and Aim

Restoring lateral maxillary incisors and lateral and central mandibular incisors is often challenging because of the limited space available for implant placement as well as high patient expectations.^{1,2} Narrow-diameter tapered implants are frequently used in this indication because they fit between adjacent natural tooth roots and are well-suited for an optimized emergence profile of the final restoration.



To evaluate the efficacy and safety of variable-thread tapered 3.0 mm implants placed in immediate function in private clinic and hospital-based settings over a 5-year follow-up period.

Methods and Materials

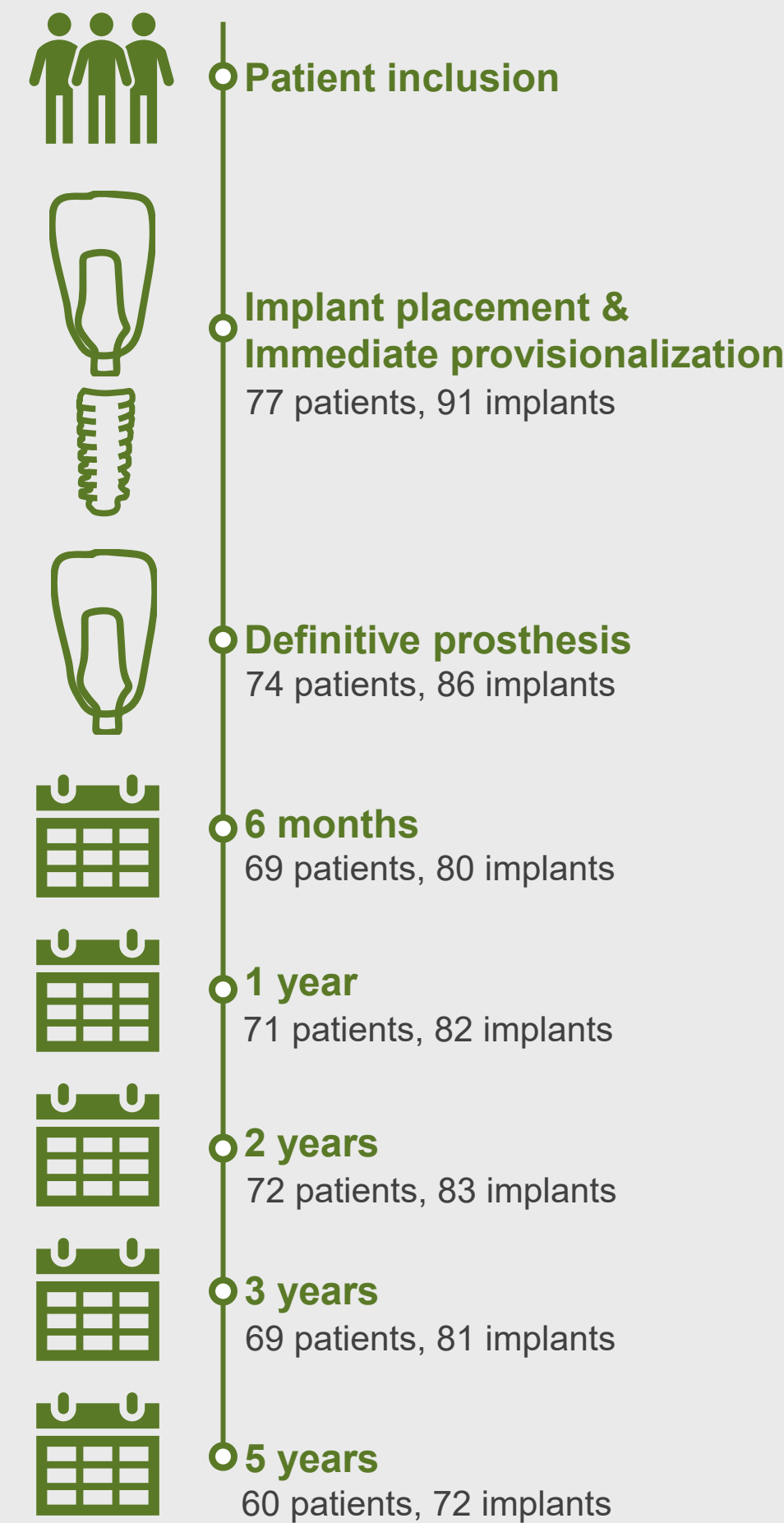


Figure 1. Study flow-chart with the number of patients and implants available at each follow-up visit.

This open, prospective, single cohort, multi-center study enrolled patients in need of one or more implant-supported single crown(s) in the anterior maxilla or mandible. Patients had to meet strict criteria for immediate loading, such as being a non-smoker with good oral health and sufficient bone quality and quantity. Implants (NobelActive 3.0, Nobel Biocare AB, Göteborg, Sweden) were placed in extraction or healed sites and subjected to immediate provisionalization provided they met the stability inclusion criteria, i.e., a minimum insertion torque of 35 Ncm. Patients were followed for 5 years (Fig 1).

Primary outcome measure

- Marginal bone level and bone level changes (MBLC) over time, assessed using paired standardized periapical radiographs

Secondary outcome measures

- Cumulative survival rate
- Cumulative success rate according to the van Steenberghe criteria
- Jemt's papilla index
- Mombelli's modified plaque index
- Mombelli's modified bleeding index
- Pink Esthetic Score (PES)

Results

- Mean patient age at surgery was 40.9 ±18.9 years. Selected baseline characteristics are shown in Fig 2.

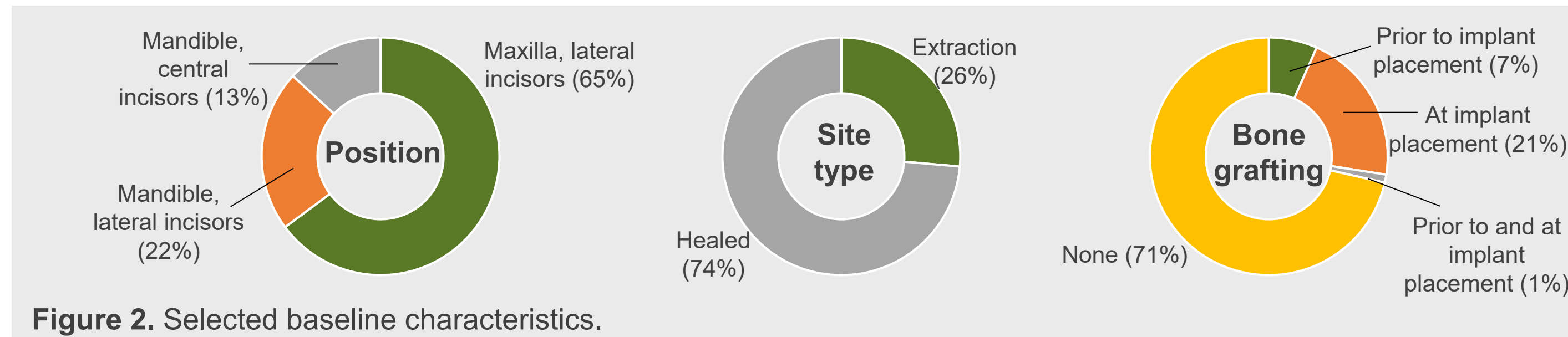


Figure 2. Selected baseline characteristics.

- The mean final insertion torque was 39.03 ±4.65 Ncm and all implants were immediately provisionalized.
- **High 5-year cumulative implant survival and success rates** of 96.5% and 95.2%, respectively. Three implants were lost, all within the first 3 months after implant insertion.
- **Stable marginal bone levels** (Fig 3) after initial remodeling post implant insertion. The mean MBLC from implant insertion was -0.24 ±1.30 mm to 1 year (n=73) and -0.21±1.29 mm to 5 years (n=63).

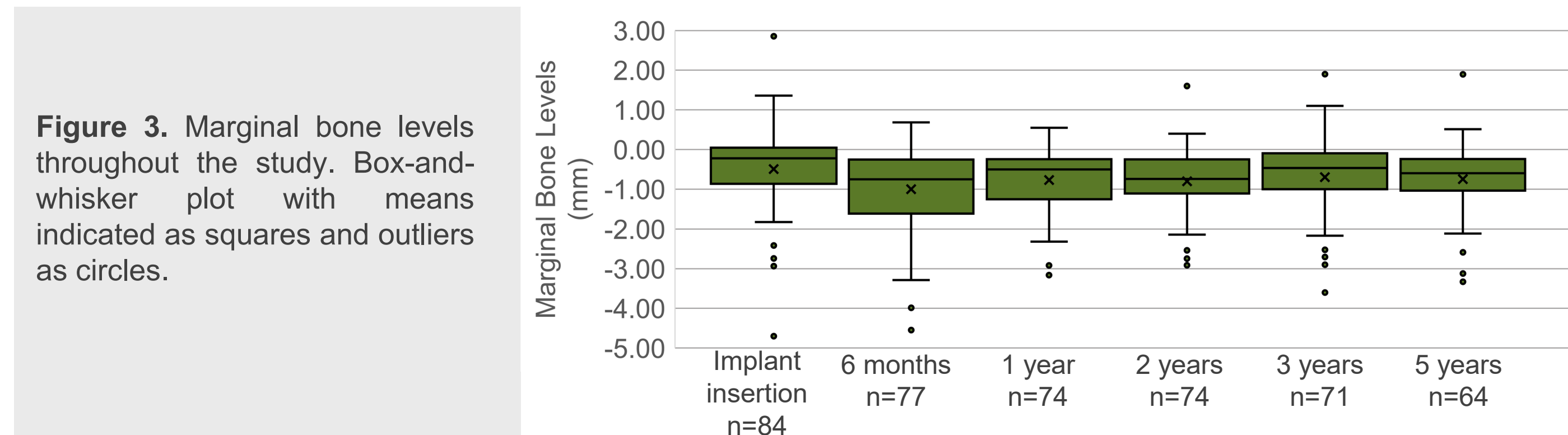


Figure 3. Marginal bone levels throughout the study. Box-and-whisker plot with means indicated as squares and outliers as circles.

- **Healthy soft tissue** throughout the follow-up period: at 5 years the papilla index score was 2 or 3 at 80.6% of mesial and 76.4% of distal papillae, no plaque was present at 73.6% of sites, the bleeding index was 0 at 73.6% of sites, with no heavy or profuse bleeding reported, while the overall PES was 9.01.

Conclusion

Stable marginal bone, healthy soft tissue, and high success and survival rates with variable-thread tapered 3.0-mm diameter implants indicate that these implants are a safe and predictable treatment option in patients with limited bone volume and/or limited interdental space and eligible for immediate loading protocols.

References

1. Slagter KW et al. (2014) J Periodontol 85(7):e241–e250.
2. Buser D et al. (2004) Int J Oral Maxillofac Implants 19(Suppl):43–61.

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Clinical Case

An 18-year-old male with a missing lateral incisor in the maxilla (FDI position 22) received a narrow-diameter 15mm-long implant. The implant was provisionalized immediately, and the final prosthesis was delivered 5 months later.



Figure 4. Radiograph (left) at implant insertion and clinical view (right) at final prosthesis delivery.



Figure 5. Radiograph (left) and clinical view (right) at 1 year.



Figure 6. Radiograph (left) and clinical view (right) at 2 years.

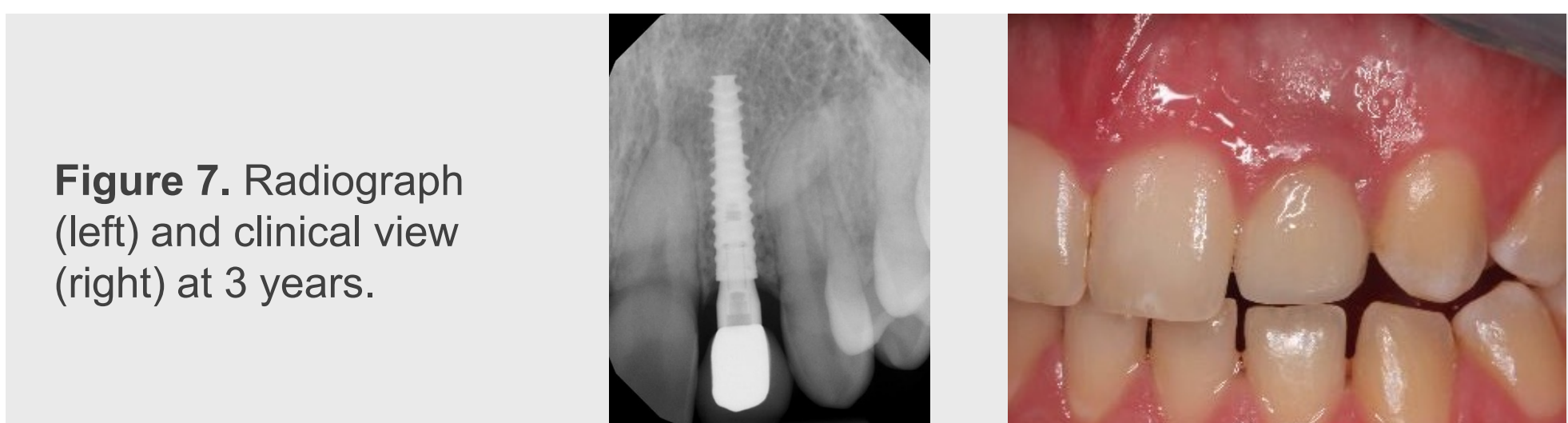


Figure 7. Radiograph (left) and clinical view (right) at 3 years.



Figure 8. Radiograph (left) and clinical view (right) at 5 years.