

The outcome of oral implants placed in limited vestibule-oral bony dimensions: a 3-year prospective follow-up study.

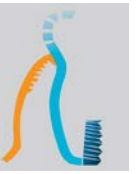
378



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Topic: Implant therapy outcomes, surgical aspects

Background and Aim

The dimensions of the alveolar bone reduce significantly after tooth loss. Clinicians consider a 1 to 2 mm buccal & lingual bone width mandatory at implant placement. This retrospective study analyses the interproximal bone changes radiologically (up to 3-year after functional loading) for implants placed in sites with ≤ 4.5 mm of vestibule-oral bone width. The bone width is measured on 3-dimensional radiographs.

Methods and Materials

This retrospective, single centre study, included 28 patients (mean age 63, 11% male, 89% female) who presented with a narrow alveolar crest. All the patients were pre-operatively scanned (cone-beam CT or multi-slice CT). Implants were only placed in sites with ≤ 4.5 mm of vestibule-oral bone dimensions. A total of 100 implants (AstraTech, Mölndal, Sweden) were installed with a two-stage procedure. The intra-oral radiographs were taken at the following moments: placement, abutment connection, 1-year follow-up, 2-year follow-up and 3-year follow-up. The distances in millimetres between the neck of the implant and the first clear bone-to-implant contact mesially and distally were recorded. The analysis of peri-implant bone level alterations was performed by 2 calibrated, independent periodontologists (JK and AT). Results were re-evaluated when there was a ≥ 1 mm inter-examiner difference.

Results

All implants integrated and the cumulative survival rate after 3-years was 100%. The implants were inserted $0.81 \text{ mm} \pm 0.83$ subcrestal. At abutment connection the bone was located $0.65 \text{ mm} \pm 0.6$ apical of the implant shoulder (baseline). During the first 3 years of loading the amount of marginal bone loss was 0.17 ± 0.4 , 0.05 ± 0.4 , and -0.06 ± 0.1 mm, respectively.

Table 1: Intra-oral distribution of implants (n, %)

Quadrant	6	5	4	3	2	1	%
1st	0	3	11	6	15	6	41%
2nd	2	4	14	6	14	7	47%
3th	0	1	3	0	2	0	6%
4th	0	2	0	3	1	0	6%

Table 2: Distribution of implants according to jaw and length (n, %)

Length (Ø3.5mm)	Upper Jaw	Lower Jaw	%
8	0	1	1%
9	9	0	9%
11	31	2	33%
13	40	5	45%
15	8	4	12%

Conclusions

Based on the present data and within the limitations of this study it became clear that implants, placed in sites with limited dimensions (≤ 4.5 mm width), showed minimal amounts of marginal bone loss during the first 3 years.

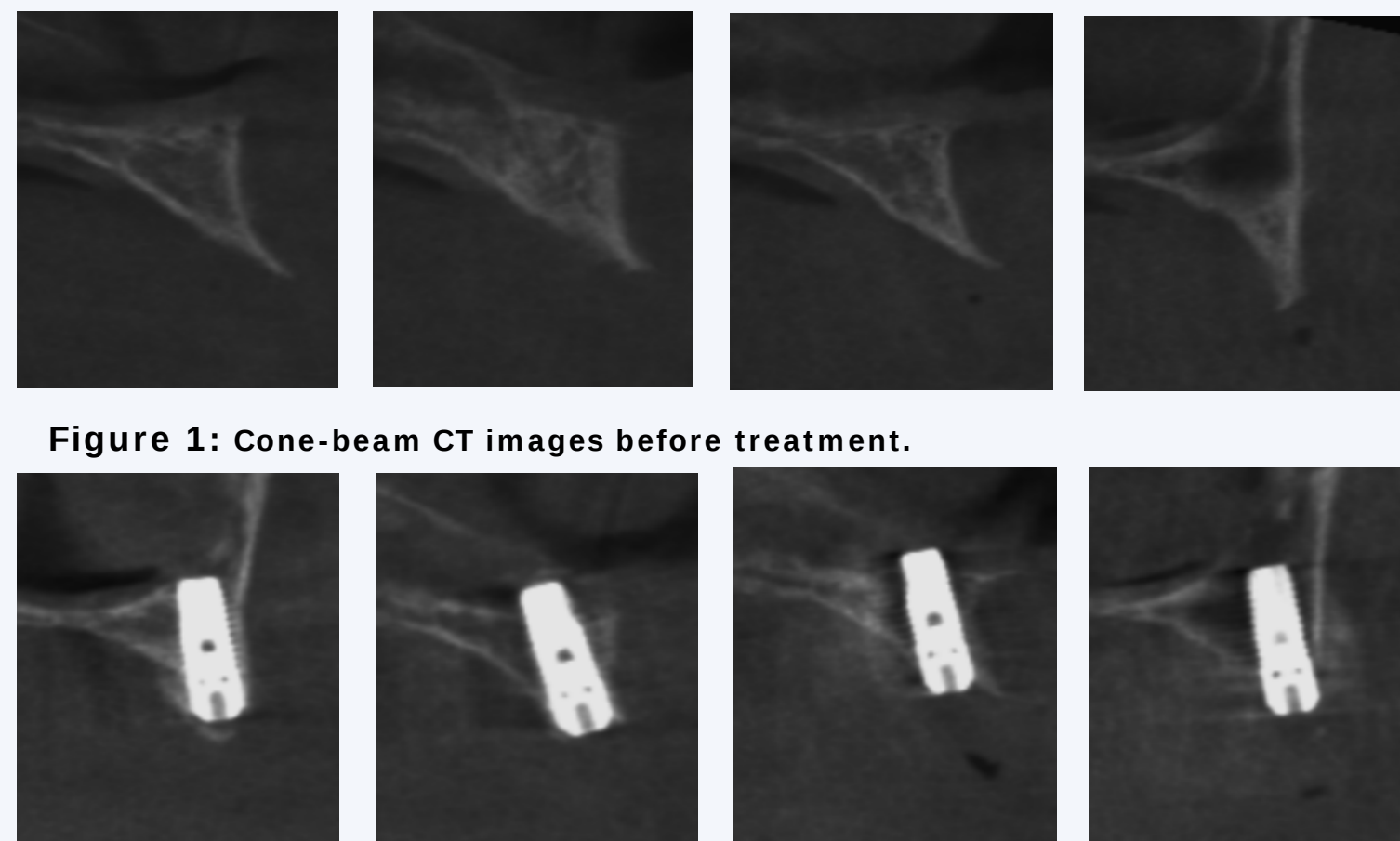
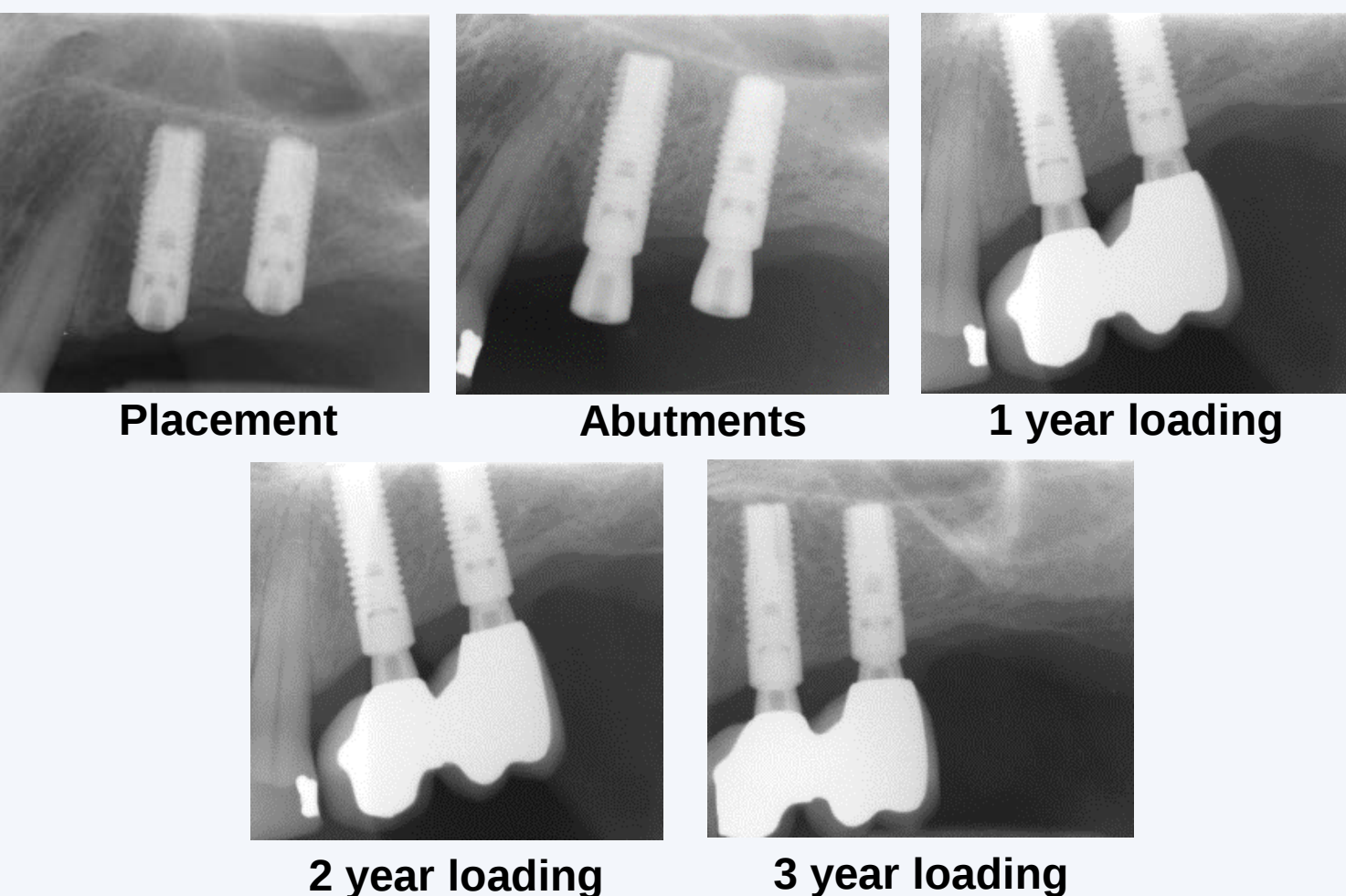


Figure 1: Cone-beam CT images before treatment.

Figure 2: Cone-beam CT images after treatment