

A retrospective analysis of the use of 3.25 mm Neoss ProActive implants for single tooth replacements and short bridges following both immediate and conventional loading protocols

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This retrospective analysis of 110 narrow implants (Neoss ProActive 3.25 mm) in 75 patients showed a survival rate of 98.2% after an average follow up of 4.3 years (range 0.5 – 8 years).

INTRODUCTION

The use of narrow implants (< 3.5 mm) is indicated in cases with narrow tooth gaps, typically for replacement of lower incisors and upper laterals. Narrow implants are also useful in areas of thin bone as an alternative to bone regenerative procedures. The reliability of narrow implants has been demonstrated in several studies when using conventional loading protocols.¹ Narrow 3.3 mm implants have also been reported to be successful when loaded 6-10 weeks after surgery,² as well as within 48 hours after surgery.³ However, fractures due to long-term fatigue have been described for some narrow implant types.^{4,5}

The aim of this study was to retrospectively analyze the survival and fracture rates of 3.25 mm Neoss ProActive implants when used for single tooth replacements and short bridges in the anterior regions of both jaws.

MATERIALS AND METHODS

A total of 75 patients (38 female, 37 male, mean age 56.2 ± 14.5 years), who had received 110 narrow implants (Neoss

ProActive, 3.25 mm in diameter, Harrogate, UK) to support 42 single tooth replacement and 35 partial bridges in four clinics were included in the analysis (Table 1). Data was collected on average 4.3 ± 2.0 years after surgery (range 0.5 to 8 years). The implants had in general been placed following the drilling protocol as recommended by the manufacturer, i.e. using spiral drills of 2.2 and 2.85 mm in diameter and, if needed, a countersink bur. Forty-nine

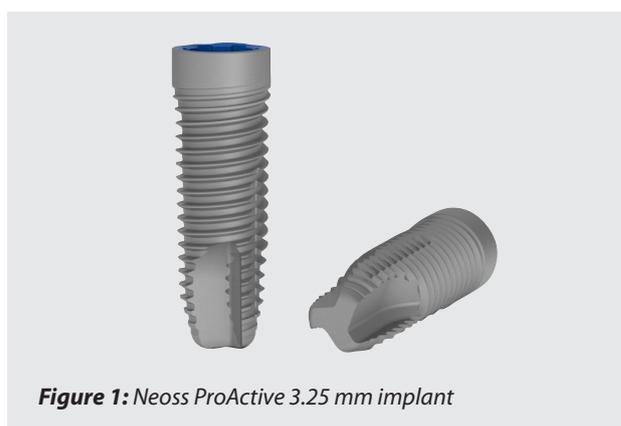


Figure 1: Neoss ProActive 3.25 mm implant

Parameter	Group	n	%
Clinic	Clinic 1	29	24.6
	Clinic 2	21	19.1
	Clinic 3	26	23.6
	Clinic 4	34	30.9
Jaw	Maxilla	38	34.5
	Mandible	72	65.5
Position	Upper lateral incisor	23	20.9
	Lower incisor	59	53.6
	Other	28	25.5
Implant length	9 mm	3	2.7
	11 mm	20	18.2
	13 mm	47	42.7
	15 mm	40	36.4
Loading protocol	Immediate	49	44.5
	One-stage delayed	14	12.7
	Two-stage delayed	47	42.7
Type of prosthesis	Single crown	42	38.2
	Partial bridge	68	61.8

Table 1: Baseline parameters

(49) implants were loaded immediately or within 3 days after surgery, and 61 implants were allowed to heal some 3 months prior to loading. For immediately/early loaded implants, an impression was taken for manufacturing of a provisional crown or short bridge or a premade construction was adapted to temporary abutments after surgery. Care was taken to avoid occlusal contacts. The provisional constructions were later replaced by permanent ones. The remaining implants received either a cover screw or a healing abutment until abutment connection and/or impression for a permanent construction (Figure 1).

Data regarding complications such as fracture and implant failure was obtained from the patient charts. No ra-

Time interval	Implants	Failed	Withdrawn / Not followed	CSR
Insert. - Load.	110	2	0	98.2%
Load. - 1 year	108	0	4	98.2%
1 - 2years	104	0	15	98.2%
2 - 3 years	89	0	5	98.2%
3 - 4 years	84	0	6	98.2%
4 - 5 years	78	0	19	98.2%
5 - 6 years	59	0	31	98.2%
6 - 7 years	28	0	14	98.2%
7 - 8 years	14	0	9	98.2%
8 years	5	-	-	-

Table 2: Life table

diographic analyses were made in this preliminary study.

The study was conducted in full accordance with ethical principles, including the World Medical Association Declaration of Helsinki. All patients were carefully informed about the procedure and gave their written consent to the treatment. Ethical approval is not required in Italy for retrospective quality assurance studies of routine treatments.

RESULTS

Two implants failed, which gives a survival rate of 98.2% after a mean follow-up of 4.3 years (Table 2). Both failures occurred in the mandible shortly after placement (4 and 8 weeks postoperatively). One implant was subjected to immediate loading and one received a healing abutment at surgery. Thus, the survival rates for immediately loaded and conventional protocol implants were 98.0% versus 98.4%, respectively.

The primary stability was 70.0 ± 6.7 ISQ based on measurements of 83 of the 110 implants at placement surgery.

No implant fractures or other major complications were reported.

DISCUSSION

The present retrospective report showed that narrow Neoss Proactive implants can be used in clinical routine for replacement of small teeth and utilized in narrow bone sites with good results, as only two of 110 implants failed during the 0.5 to 8 years of follow-up. A systematic review of the literature showed an overall survival rate of 97.2% for 672 narrow implants with a diameter of 3.0 to 3.25 mm, which further supports the idea that the use of narrow implants is an effective treatment option.¹

According to the surgeons, firm primary stability was easily obtained with this implant, an observation that was confirmed by the ISQ measurements. Only one of 49 immediately loaded implants failed, which indicates that the implants integrated well in spite of the loading protocol. This is in line with Lambert and co-workers, who reported a 97.4% one-year survival rate for 39 narrow implants (3.3 mm) in 20 patients in both anterior and posterior areas with reduced thickness (< 6 mm) of the alveolar crest.³ In a multicentre study, 97 narrow implants (3 mm) were placed in 69 patients and loaded after 6-10 weeks with a permanent fixed prosthesis.² The authors reported on a survival rate of 95.5% and stable bone levels. It should be noted that the immediately loaded implants in the present study were, if possible, out of occlusion.

A limitation of the present preliminary report is that no radiographic analyses of the implants were made. Thus, any statements regarding the marginal bone conditions

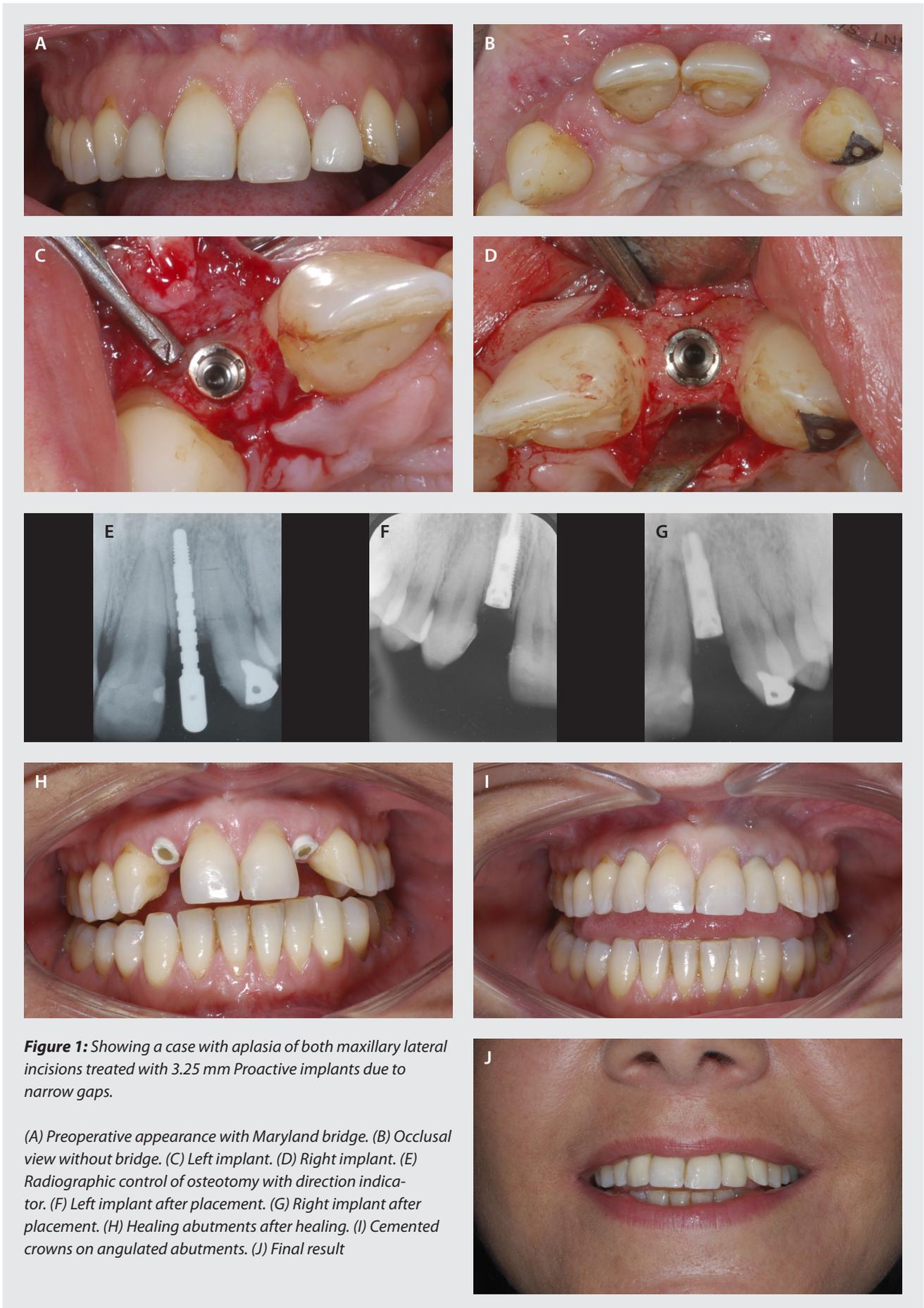


Figure 1: Showing a case with aplasia of both maxillary lateral incisions treated with 3.25 mm Proactive implants due to narrow gaps.

(A) Preoperative appearance with Maryland bridge. (B) Occlusal view without bridge. (C) Left implant. (D) Right implant. (E) Radiographic control of osteotomy with direction indicator. (F) Left implant after placement. (G) Right implant after placement. (H) Healing abutments after healing. (I) Cemented crowns on angulated abutments. (J) Final result

cannot be done.

It is concluded that the 3.25 mm Neoss ProActive implant obtains firm primary stability and results in high survival rates also when immediate loading protocols are used.

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