



Dr. Charles Babbush

The All-on-4™ immediate function treatment concept with the NobelActive™ implants

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Introduction

Well-documented literature is available on the use of immediate loading of implant-supported full arch prostheses for the edentulous mandible and/or maxilla as a predictable procedure.¹⁻⁵ The All-on-4™ treatment concept provides edentulous or immediate-/post-extraction subjects with an immediately loaded fixed prosthesis using four implants; two axially oriented implants in the anterior region and two tilted posterior implants.⁶⁻⁷ Tilting of the implants increases the inter-implant distance, reduces the need for bone augmentation, and preserves relevant anatomical structures while allowing for longer implants. The principle involves four implants placed with straight and angled multi-unit abutments, which support a provisional, fixed, and immediately loaded, full arch prosthesis. Overall, published data on the All-on-4™ concept shows cumulative survival rates between 92.2 and 100%.⁶⁻¹²

Objectives

To date, the All-on-4™ concept has been reported in literature predominantly with the use of NobelSpeedy™ implants. This single center retrospective study evaluated the concept utilizing an implant with a tapered body and a variable thread design, and having a phosphate enriched titanium dioxide surface (NobelActive™).

Methods and Materials

One-hundred-sixty-five (165) subjects (72 males and 93 females) have been included in the present retrospective study, in which the All-on-4™ concept has been used for the treatment. All subjects had a totally edentulous arch or immediate extraction of the remaining teeth. They have been rehabilitated with a total of 708 implants with a tapered body and a variable thread design system (NobelActive™, Nobel Biocare, Sweden). Implants were placed in healed and/or fresh extraction sites. The subjects were treated either in the maxilla (109) or in the mandible (68), whereof 12 subjects were treated in both jaws. Each jaw received two axial and two distally tilted implants and was subsequently restored with an immediately loaded, fixed complete-arch provisional prosthesis according to the All-on-4™ concept. The definitive prosthesis was delivered within six months after implant insertion.

Implant follow-up occurred up to 23 months. An actuarial life table method was used to determine implant survival rate. Fisher’s exact test was used to determine the level of significance comparing the survival rate of the arches.

Results

Four-hundred-thirty-six (436) implants have been placed in the mandible and 272 in the maxilla. Three implants failed in the maxilla, which were replaced successfully. The failures occurred one, four and seven months post-operative. The overall cumulative survival rate was 99.5% (one year) (*Table 1*) with no significant difference between the maxillae and mandibles (99.3% vs. 100%, p = 0.06, Fisher’s exact test). No total-arch failures have occurred to date, reporting a definitive prosthesis survival rate of 100%. *Figures 1–7* demonstrate a case in post extraction sites and *Figures 8–13* demonstrate a case in healed sites.

Table 1: Life Table Analysis

	Placed/ Followed Implants	Failed/ Replaced	Time Not Passed	CSR
II – 3 months	708	1	0	99.9
3 – 6 months	707	1	114	99.7
6 – 12 months	592	1	319	99.5
12 – 18 months	272	0	208	99.5
> 18 months	64			

II = Implant Insertion; CSR = Cumulative Survival Rate

Conclusions

Preliminary survival rate using the All-on-4™ immediate function treatment concept with above-mentioned implant can be considered a viable treatment concept for subjects presenting with edentulous arches and/or immediate placement.

See reverse side for larger images

An Immediate Post Extraction Case

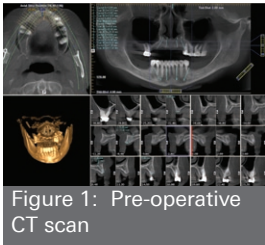


Figure 1: Pre-operative CT scan

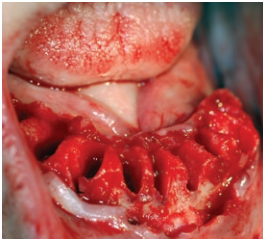


Figure 2: Extracted mandibular teeth

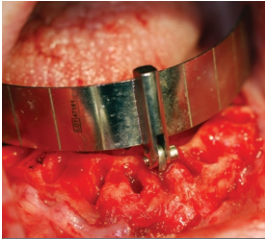


Figure 3: All-on-4™ surgical guide

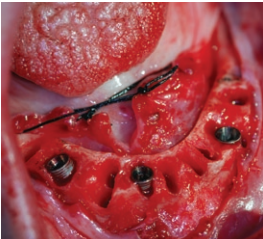


Figure 4: Implants in final position

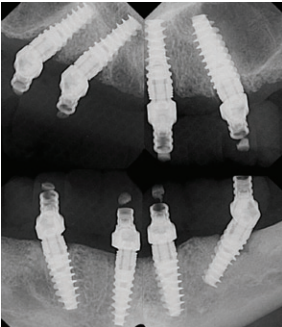


Figure 5: Post-operative radiographs at four months



Figure 6: Clinical photograph of patient at one year

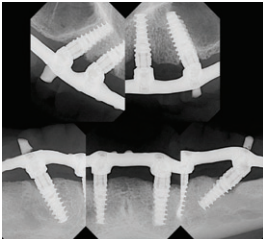


Figure 7: Post-operative radiographs at one year

A Case in Healed Sites

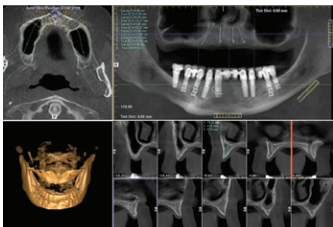


Figure 8: Pre-operative CT scan



Figure 9: Implants in final position

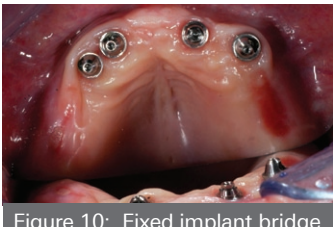


Figure 10: Fixed implant bridge removed to demonstrate soft tissue health at one year



Figure 11: Clinical view at one year

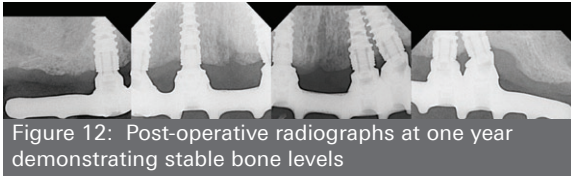


Figure 12: Post-operative radiographs at one year demonstrating stable bone levels



Figure 13: Post-operative radiographs at two years demonstrating stable bone levels

References

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Enlarged images for

The All-on-4™ immediate function treatment concept with the NobelActive™ implants

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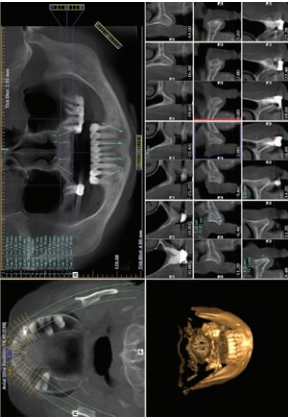


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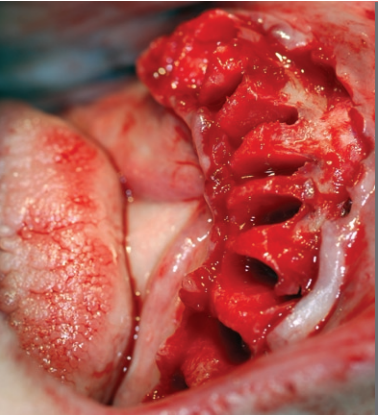


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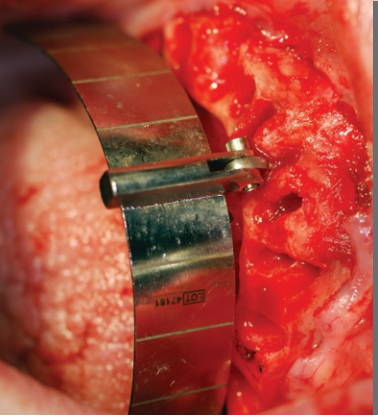


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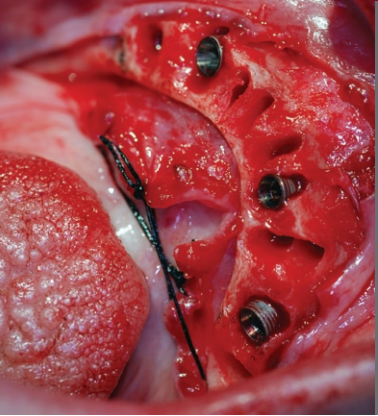


Figure 4: Implants in final position

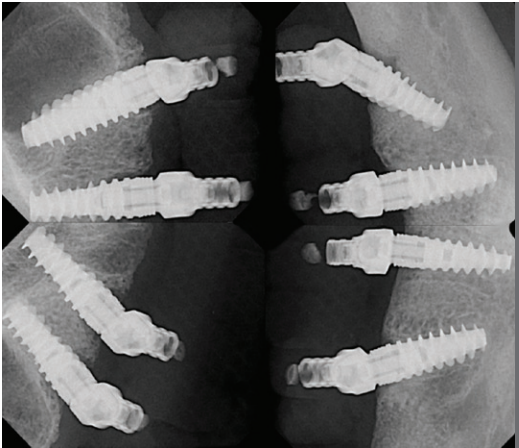


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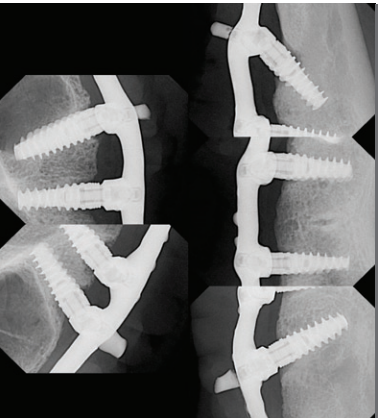


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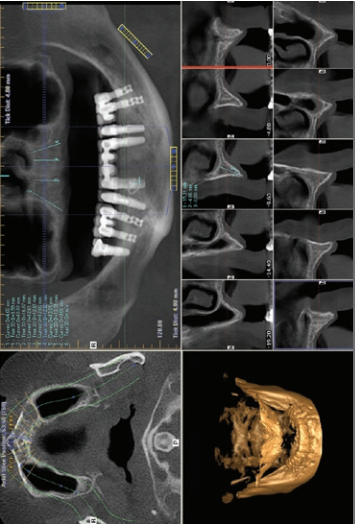


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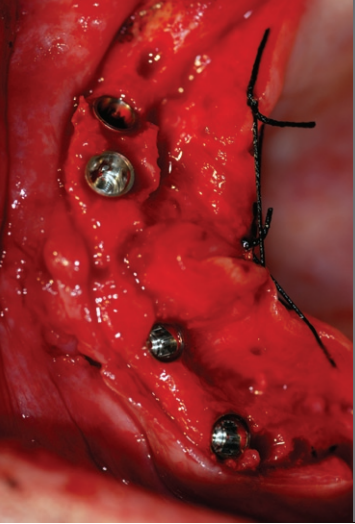


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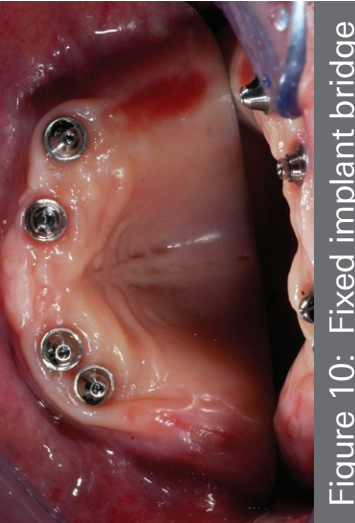


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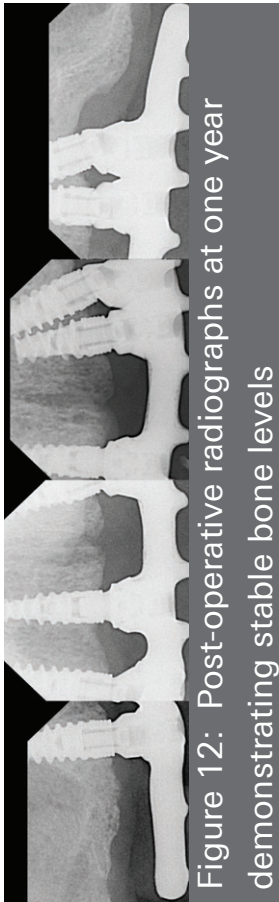


Figure 12: Post-operative radiographs at one year demonstrating stable bone levels

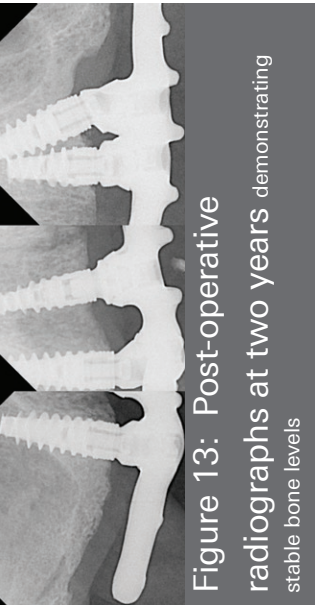


Figure 13: Post-operative radiographs at two years demonstrating stable bone levels