Placement of Brånemark Mk IV implants in compromised and grafted bone: Radiographic outcome of 61 sites in 27 patients with 3- to 7-year follow-ups

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Objective: Sites in which bone is reduced in quality or height create challenges in esthetic reconstruction and loading support, which leads to a higher risk of failure. The Mk IV system with a TiUnite surface was designed specifically for placement in soft bone. This paper describes postloading outcomes of 103 Mk IV implants, with a focus on bone preservation in compromised bone sites during early remodeling, stability after abutment connection, and a 3- to 7-year follow-up from implant placement. Method and Materials: A series of 103 4-mm (diameter), ≥ 10-mm (length) Mk IV implants were placed in the maxillae of 25 females and 14 males. Twenty-three patients also received staged bone grafts, and two underwent socket augmentation as well as grafts. Areas of previous infection were prepared mechanically and chemically. To ensure primary implant stability, the size of the osteotomy and the number of entries were minimized. Following a delayed loading protocol, all patients were restored with fixed partial dentures. For analysis of bone stability, the marginal levels on the mesial and distal aspects of the implants were measured at 7x magnification by a radiologist not involved in the treatment. Results: Three implants were lost, 1 implant was never loaded although it integrated, 14 implants were not available for follow-up after abutment correction, and 5 had poor-quality radiographs. The mean marginal bone loss between implant insertion and loading was 1.21 ± 0.86 mm (n = 60). The differences in bone-remodeling levels in grafted and nongrafted sites were not significant. Data are reported on 103 implants in 39 consecutive patients through abutment connection, with radiographic follow-up from 3 to 7 years postimplant placement on 27 patients. Conclusion: It is critical to ensure optimal three-dimensional orientation and minimize site preparation, particularly when placing implants in compromised bone. With bone of poor preoperative density using a customized site preparation technique, excellent short-term implant survival and long-term bone stability have been demonstrated. Further follow-up will determine whether the Mk IV implant is the optimal design for compromised bone, including associated soft tissue stability. (Quintessence Int 2012;43:293–303)

Key words: bone augmentation, bone loss, compromised, dental implants, follow-up studies, surface

Since their introduction, Brånemark dental implants have become a popular method of restoring function and esthetics after tooth loss. Several implants have been designed for specific circumstances, such as sites in which the bone is reduced in quality or shape. These conditions create challenges in esthetic reconstruction and functional support, with some authors reporting a higher risk of failure. Apparently, when ridge anatomy is reduced, grafts may be desirable to increase the potential implant sites and locations. In this case, it may therefore be necessary to consider various implant macrostructure designs.

The Mk IV system with a TiUnite surface (Nobel Biocare) was designed specifically...