Fig. 3i_Contained tooth gap treated with 2 Aadva implants; 2 years follow-up.
Fig. 3j_Posterior tooth gap treated with 3 Aadva implants; 3 years follow-up.
Fig. 3k_Posterior tooth gap treated with 3 Aadva implants; 4 years follow-up.
Fig. 3l_Posterior tooth gap treated with 3 Aadva implants; 5 years follow-up.


Fig. 3i

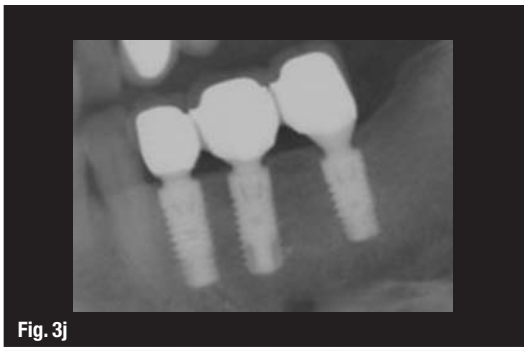
Fig. 3j

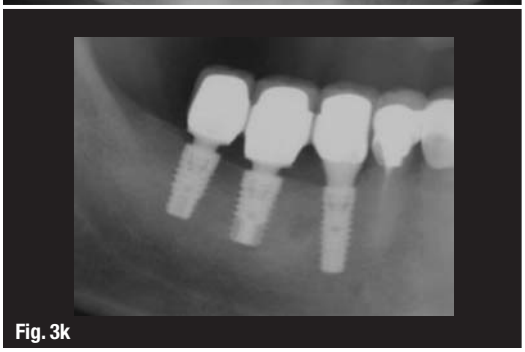
Fig. 3k


Fig. 3l

a strong soft tissue collar. The internal connection consists of a machine taper (11°) and a hexagonal index. The implant shows a fairly homogenous roughness over the entire surface with a Sa-value ranging from 2.0 to 2.3 µm. The corresponding Ra-values vary from 1.3 to 2.5 µm. This means that this implant falls just within the category of moderately rough implants.

A total of 393 GC Aadva implants were placed. Their intra-oral distribution is summarised in table 1. The implants were primarily placed in the upper jaw (248 implants, 63.1 %) and often in the premolar area (120 implants, 30.5 %) or the molar area (157 implants, 39.9 %). The diameter of most implants was 4 mm (n = 284), but narrow (n = 69) and wide implants (n = 40) were used as well. Several implant lengths were used: 8 mm (57), 10 mm (144), 12 mm (160) and 14 mm (32). Most implants were placed in bone quality type 2 (79.9 %), while 10.4 % were placed in type 1 bone and 9.7 % were placed in type 3 bone.[23]

Several patients presented risk factors: 10 % of the patients were smokers; bone dehiscence occurred in 12.9 % and pre-operative guided bone regeneration was necessary at 6 % of the sites. A sinus floor elevation was required in 11 % of the cases, and 11.5 % of the implants had only limited primary stability at the time of placement. A total of 5 implants were lost. These losses were probably due to an excess of clinical indications in order to push the capabilities of the implant Aadva. A Kaplan-Meier analysis (Tab. 2) showed a 98.5 % cumulative success rate for the implants after 42 months. For 334 implants (118 patients) the marginal bone loss could be followed longitudinally (Tab. 3). The cross-sectional data (not always with the same implants at any given time) revealed a 0.2 mm bone loss between placement and loading, 0.2 and 0.4 mm during the first and second years, and no further loss afterwards. The longitudinal analyses (with the same implant observed at several points in time) showed a 0.3 mm relative bone loss during the first and second year of loading, with an unchanged situation afterwards (Fig. 2). The number of implants with more than 1 mm bone loss was 5.5 % during the first year and 8.8 % during the first two years.

_Discussion

Initial bone remodelling after implant placement and loading is presently a focus of industrial competition. Some companies advertise their implant as having minimal bone loss during this period of remodelling. With some implant designs, connections and topographies, bone level was sometimes reported to be as low as the first or second macro-thread in the first months after loading.

The data of this study showed a 0.4 mm average bone loss during the healing period, which is similar to the best performing implants currently on the market. These observations contrast with studies on other implant designs that report much higher bone losses during this period.[24,25] Bone level appears to subsequently remain relatively stable with an average loss of 0.3 mm during the first and second year. Afterwards it was found that this bone resorption could be further reduced. It should nevertheless be pointed out that this paper reports on a field study, far away from the academic environment but

Marginal bone level at a specific observation time (cross sectional data)			
Time	**Number of Implants**	**Average bone level**	**S.D.**
Placement	225	0.46	0.46
Loading	170	0.67	0.64
After 1 year	167	0.88	0.66
After 2 years	156	1.26	0.80
After 3 years	115	1.26	0.73
Marginal bone loss (longitudinal observations)			
Interval	**Number of Implants**	**Average bone level**	**S.D.**
Placement – 1 y in use	129	0.47	0.61
Placement – 2 y in use	103	0.75	0.84
Placement – 3 y in use	81	0.80	0.75
Placement – loading	113	0.40	0.72
Loading – 1 y in use	75	0.27	0.52
Loading – 2 y in use	62	0.65	0.69
Loading – 3 y in use	51	0.57	0.47

Tab. 3_Marginal bone level (cross-sectional observations) and longitudinal bone loss around GC Aadva implants.

probably closer to clinical reality. Clinical studies in an academic setting are often very strictly managed, with stringent inclusion and exclusion criteria and strict patient follow-up. All these factors, which can only improve the results, were not present in this study.

The new implant performed well in various situations, from a single tooth implant to full-fixed dental restorations in all tooth positions and in different bone types. No significant changes were observed in the survival rate between treatment options (immediate placement, GBR, etc.). The survival rate (98.5 % after 3.5 years) is within or better than the survival rates reported in clinical studies until now.[26, 27] In the current study, only 5 out of 399 implants were lost, probably due to insufficient primary stability.

These findings can further be supported with data from an in-vitro study in pigs by Joke Duyck's group, comparing the osseointegration process between the GC Aadva and Osseospeed Astra Tech implants. After 1 and 3 months, only very limited differences were observed in many parameters such as bone-to-implant contact, marginal bone level, etc.[28]

Clinical observations showed almost no soft tissue recession, as illustrated in a case (Fig. 3). It is assumed that this is due to the favourable crestal bone height and the internal connection (platform switching).

_Conclusion

The recently introduced implant design showed stable bone and soft tissue levels. This is a promising result, but a long-term study is required to confirm these initial very favourable results._

Editorial note: A list of references is available from the publisher.

contact

Marc Quirynen
Department of Periodontology
Faculty of Medicine, Katholieke Universiteit Leuven
Kapucijnenvoer 33, B-3000 Leuven, Belgium
marc.quirynen@med.kuleuven.be