Dr. Tamás Asztalos

My experience with the new Denti® Ø3.3 implants

On its Symposium held on the last weekend of May 2010, Denti System introduced, among other novelties, the latest member of its root-form implant family, the Denti Ø3.3 implant.

If we find poor horizontal bone mass during the planning of an implantation procedure or during the procedure itself, we usually have to make some sort of a compromise in regard to the course, nature or duration of the treatment and the prosthetic options, taking the needs of the patient into account.

If an adequate biological width cannot be provided when placing a conventional implant, we may either augment the peri-implant bone mass with one of the bone management techniques, or place a needle implant.

Both procedures, of course, have their advantages and disadvantages, which are summarized in Tables 1, 2, 3 and 4.

The adv[illegible]ages of bone mana[illegible]t:

- morphological correction of the alveolar process
- statically stronger abutments with larger surface are placed and, therefore, - fewer implants are needed (compared to the solutions using needle implants)
- the usability of the implant has a higher degree of liberty

Table 1.

The dis[illegible]ntages of bone man[illegible]

- high instrumentation requirements
- higher-level surgical preparedness
- higher risk of complications and rejection
- longer healing period
- extra costs (bone replacement materials, membrane, ..., provisional)

Table 2.

The ad[illegible]tages of needle im[illegible]

- low instrumentation requirements
- no serious experience is needed
- can be loaded quickly in case of appropriate bone quality
- cost-effective

Table 3.

The dis[illegible]ntages of needle impla[illegible]

- more implants are needed because of their small surface
- limited prosthetic value and usability
- higher rejection rate

Table 4.

In general, if we choose the faster solution and decide to place a needle implant, then (beside the lower risk of surgery and the shorter treatment period) we will have more limited options as to the nature and the (esthetic, hygienic and functional) quality of the prosthetic solutions, compared with the placement of a conventional (two-piece) implant and using the proper bone and soft tissue management. Taking the medical aspects into account, placement supplemented with bone replacement provides a better ground for the construction of an implanted prosthesis; however, the increased time and cost factors give a strong justification for the use of needle implants.

The new Denti® Ø3.3 implant makes the gap between the two options narrower. Due to its numerous advantageous properties (see Table 5), it allows for a high-standard solution that can be easily achieved and may be quickly loaded, in case of poor horizontal bone

mass.

As a member of the professional college of the Denti System, I have had the opportunity to use the Denti® Ø3.3 root-form implant in practice since June 2009. During the 1 year before the introduction, we placed 49 Ø3.3 implants. 30 of them were placed into female patients and 19 into male patients. 28 implants were loaded immediately. 10 were loaded successfully after a healing period of 5 to 6 weeks, whereas 9 of them after 3 to 5 months. The number of unsuccessful placements was 2 (both in 1 patient). 70% of the implants were inserted transgingivally, whereas the others were placed after surgical incision.

To facilitate successful use, I would like to share my experience by presenting the most typical cases of the treatment performed using the Denti® Ø3.3 root-form implant.

Case Reports

Case 1

A 55-year-old male patient presented for replacement of the lower right central incisor, which he lost due to bone resorption of periodontal origin 2 years earlier (Figure 1).

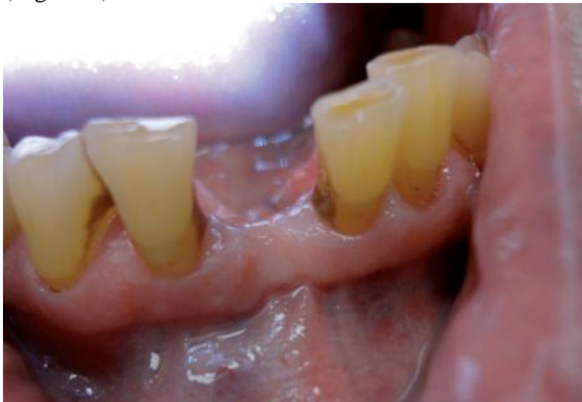

Figure 1.

Because of the tight space characteristic to single tooth losses in the lower front region, and the poor horizontal bone mass developed after a tooth loss of periodontal origin, the Denti® Ø3.3 root-form implant is an ideal choice. Since, in case of appropriate bone quality, the root-form design of the implant results in excellent primary stability, the possibility of immediate loading was raised. In support of this, we chose transgingival placement (Figure 2).

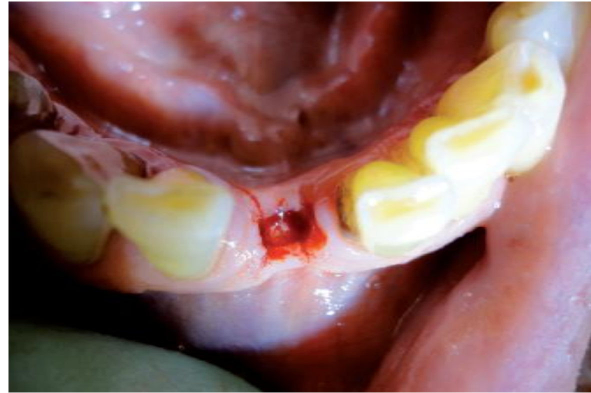

Figure 2.

After making the lead bore, its depth and direction is checked (Figure 3), because within such a tight space, we may get dangerously close to an adjacent root even in the case of only a small-degree uncorrected axis deviation.

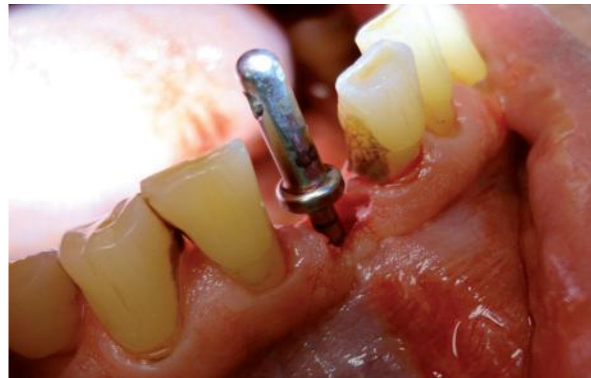

Figure 3.

The lead bore was expanded to the desired size with the bed drill, and then, after cutting the thread, the implant (R1033-135) was screwed in place (Figure 4).

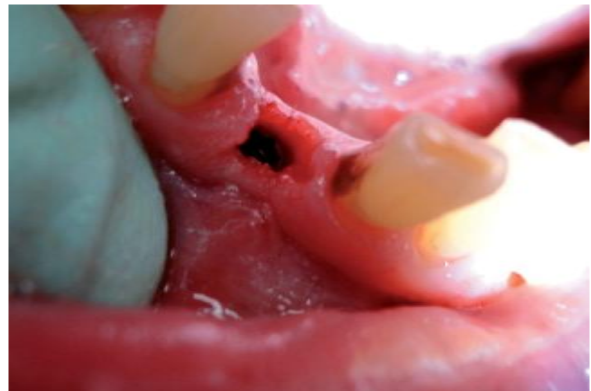

Figure 4.

The implant reached its final position at a torque stop of 50 Ncm. The implant was covered with a transgingival healing screw (Figure 5), and then we checked primary stability with a PERIOTEST device (Figure 6).

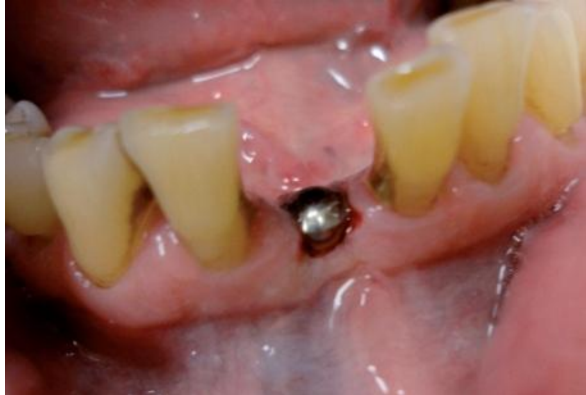

Figure 5.

Figure 6.

The measured value of 7 indicated excellent primary stability, confirming the possibility of immediate loading. The placement was checked on an orthopantomogram (Figure 7).

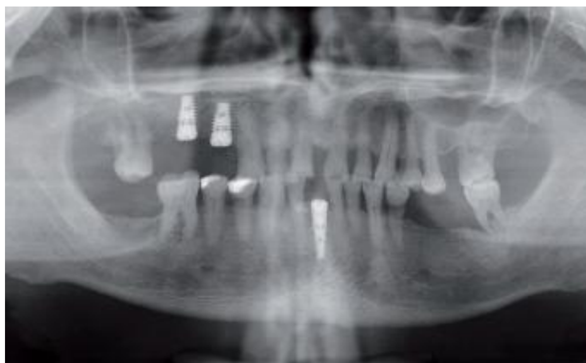

Figure 7.

On the fourth day after the procedure, we took an impression, and placed the prosthesis into the mouth after it had been constructed (Figure 8).

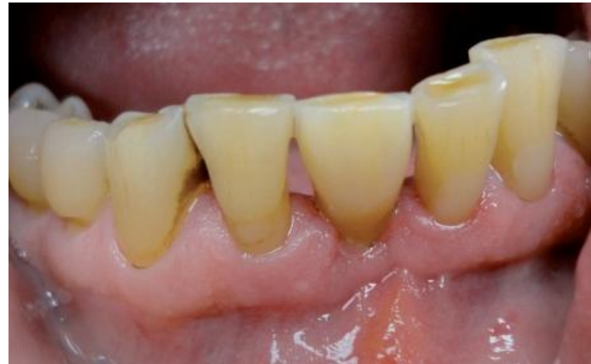

Figure 8.

Case 2

Our 63-year-old female patient presented for the prosthetic treatment of her lower teeth. Based on the orthopantomogram (Figure 9) and the examination of the patient, we found it necessary to remove the incisors in terminal condition and the molars (#45, #48) affected by chronic periodontal and periapical processes.

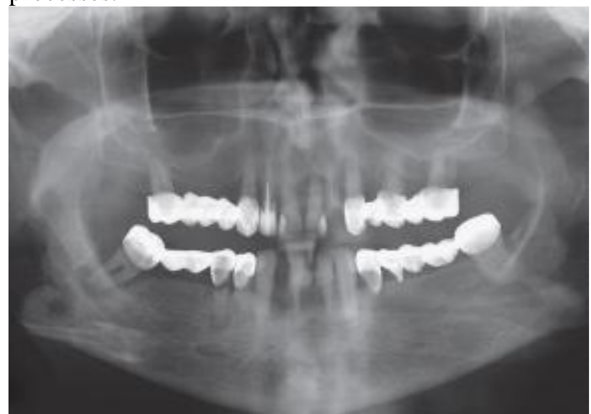

Figure 9.

To compensate for the loss of the abutment teeth on the right, we recommended the placement of implants at sites #46 and #47. Our measurements showed a horizontal bone mass of 4.5 to 5 mm in the affected area, with a relatively parallel run towards the base of the mandible. Because of the short time (2 months) available to us, we had to discard the possibility of a procedure supplemented with bone replacement. The body surface parameters of the Denti® Ø3.3 implant (Table 5) allow the use of the implant to replace molars.

Body surface (mm²):

Length (mm)	2.8 Needle	3.3 root-form	3.8 root-form
11.5	160	405	450
13.5	180	460	525
15.5	210	545	600

The surface of the root of the first molars (#6) is 420 to 430 mm^2 on average.

Table 5.

After removing the bridge and the affected teeth, we explored the area surgically, prepared the implant beds, placed the 2 Denti® R 1033-115 implants (Figure 10a-b), and then closed the wound with a suture (Figure 11).

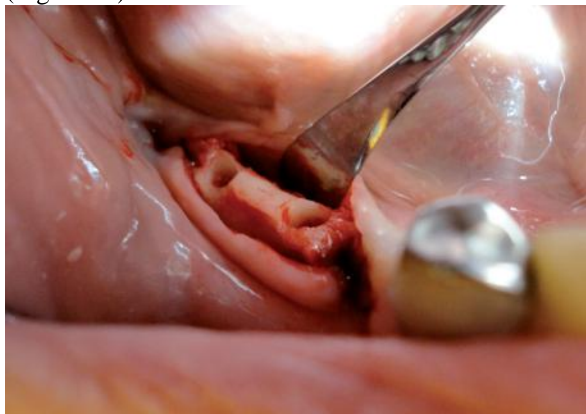

Figure 10a

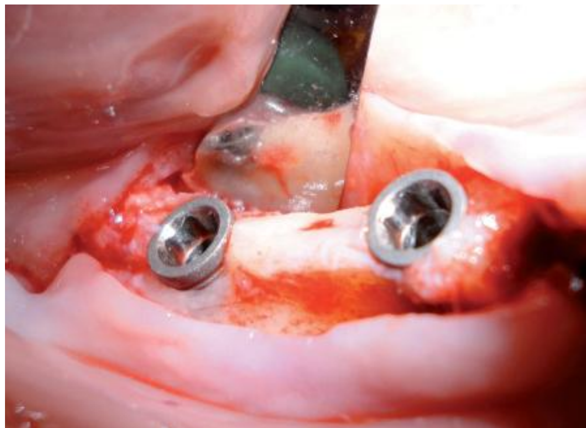

Figure 10b

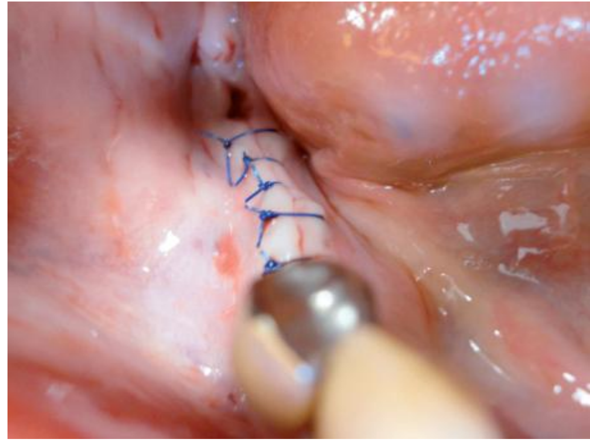

Figure 11.

After this, we applied soft-laser therapy to the area every other day (for a total of 8 times), with a dose of 2 J/implant/session. 5 weeks after the procedure, we took a control orthopantomogram (Figure 12), released the implants, and measured stability with the PERIOTEST device (#46 PTV: −5.1, #47 PTV: −5.9). Since the measured values were way over the lower limit, the prosthesis was constructed after the use of gingiva formers and the prosthetic preparation of the remaining teeth (Figure 13).

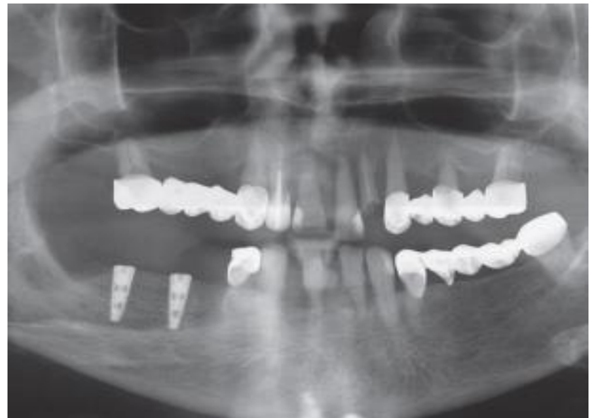

Figure 12.

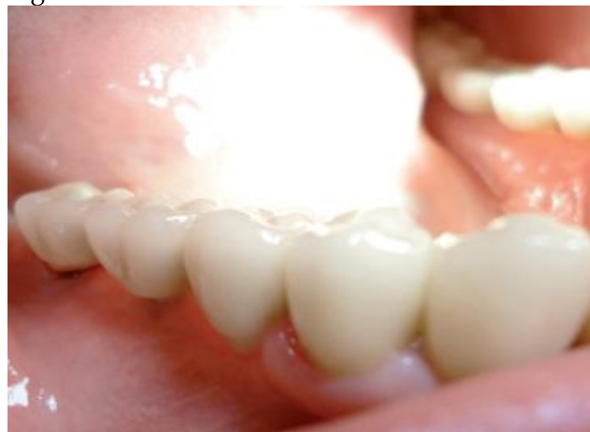

Figure 13.

Case 3

A 50-year-old female patient presented with a definite implantation purpose for the replacement of her lower lateral bridges supported by glass abutments. Based on the orthopantomogram (Figure 14) and the examination of the patient, we decided to place 3 Denti® Ø3.3 root-form implants on both sides.

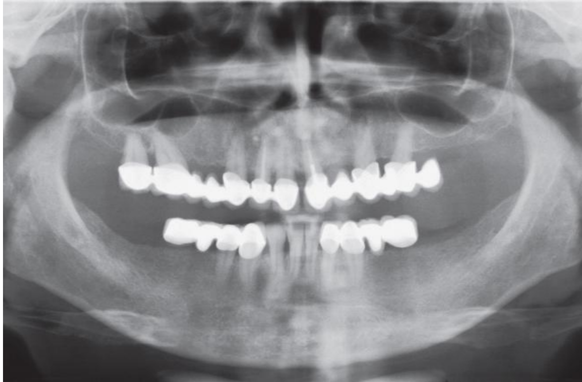

Figure 14.

After considering the complaints, and for financial reasons, the procedure was divided into two stages. The aim of our first step was to place the implants in on the right side, which was causing the complaints. After placing a temporary prosthesis (Gradia bridge) here, the implantation on the left would follow, and then, after osseointegration, we would construct the final prostheses on both sides at the same time for the planned bite raising. The vertical bone mass at the surgical site was evidently very good, but we found the horizontal bone mass to be at the limit value of 4.0 to 4.5 mm. Since we were planning the placement of two-piece implants by any means, and we did not plan to supplement the procedure with bone replacement, the only option was to use Denti® Ø3.3 root-form implants. After the removal of the "swinging" elements (Figure 15), the edentulous ridge becoming visible made it clear that the bone mass was far below the estimated value.

The picture after the surgical exploration (Figure 16) also confirmed it, because the mean thickness of the bone was 2.5 to 3 mm, and it did not show any tendency to widen to a depth of at least 6 to 8 mm. Despite these values, we chose implant placement supplemented by bone splitting. After removing the cortical layer of the ridge (Figure 17), we separated the sites #5, #6 and #7 to a depth of 8 to 10 mm, and marked the alveolar process and the location of the implants to be placed with a pilot-bore (Figure 18).

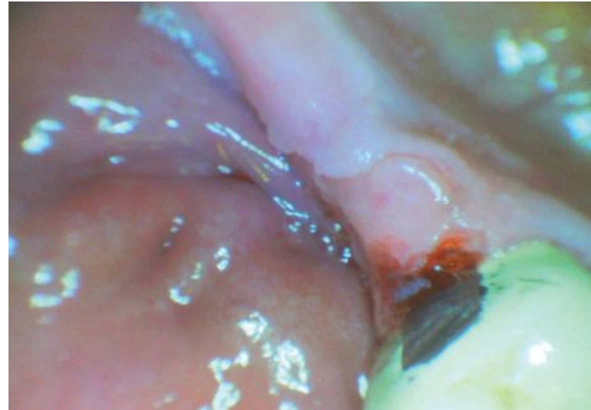

Figure 15.

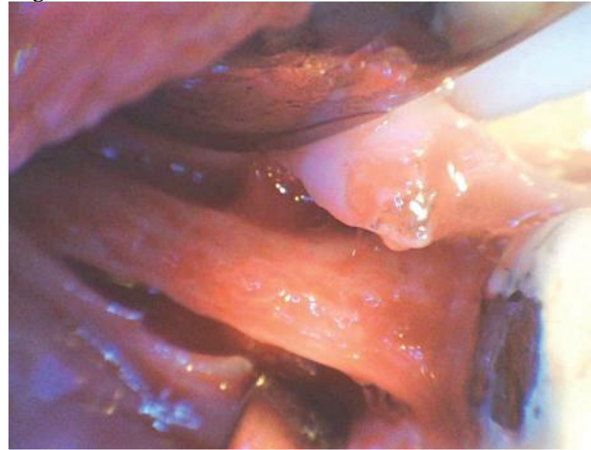

Figure 16.

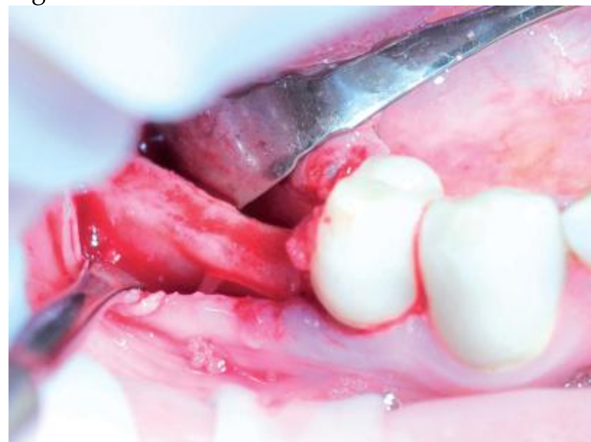

Figure 17.

The extension of the separated plates was achieved by screwing spreader screws in increasing order (and with great care) into the sites of the implants to be placed, to avoid the fracture of any of the bone plates (Figure 19).

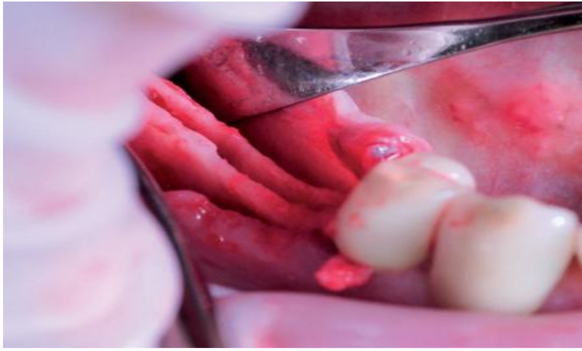
Figure 18.

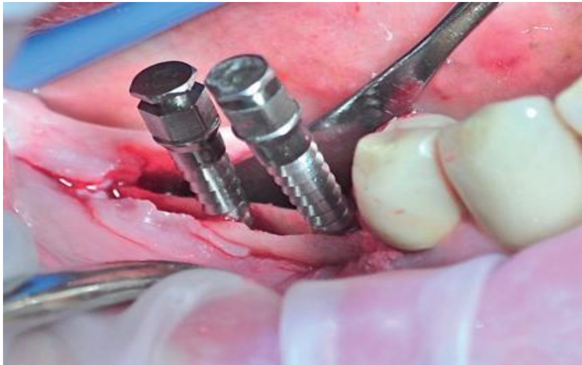
Figure 19.

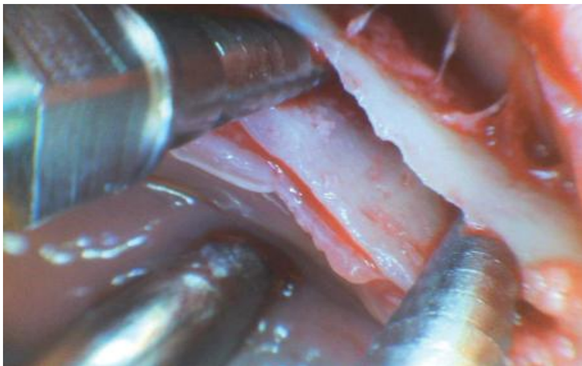
Figure 20.

Figure 21.

After reaching the desired result (Figure 20), the spreaders were replaced by 3 Denti® R 1033-115 implants (Figure 21), and the gaps were filled with Ossyresorb (Figure 22) and covered with Lyoplant membrane.

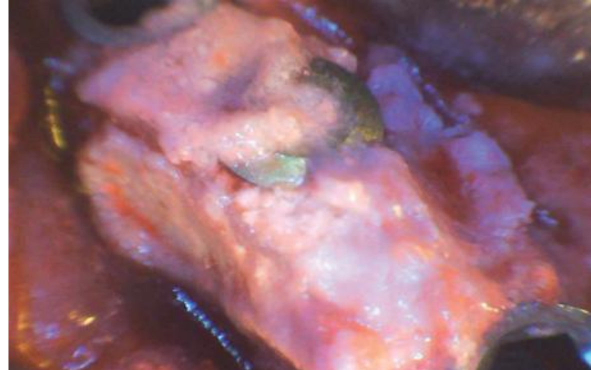
Figure 22.

Since the orthopantomogram taken 5 months later showed satisfactory osseointegration (Figure 23), after release, gingiva formation and stability measurements, the Gradia prosthesis was constructed (Figure 24).

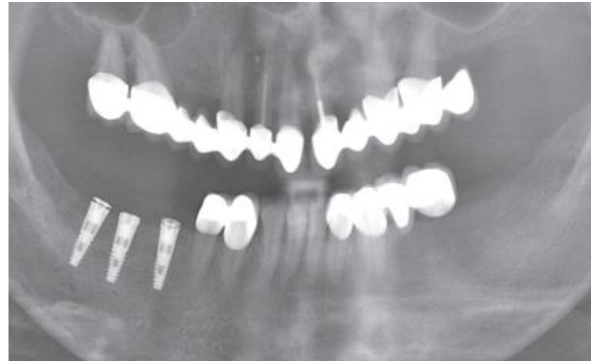
Figure 23.

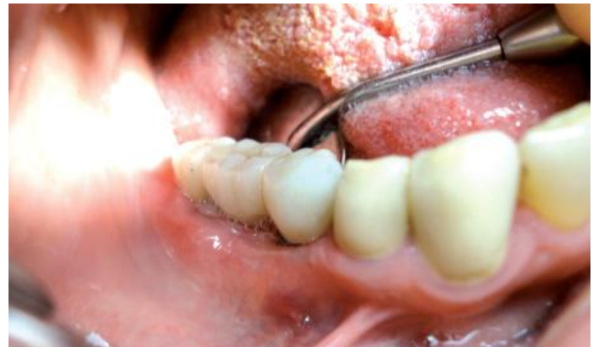
Figure 24.

Case 4

For the complete prosthetic treatment of the lower teeth of our 55-year-old female patient, we recommended an implant-retained, bar-stabilized removable denture. On the ridge with significant atrophy (Figure 25), only the mental bone core in the interforaminal region provided an opportunity to place implants.

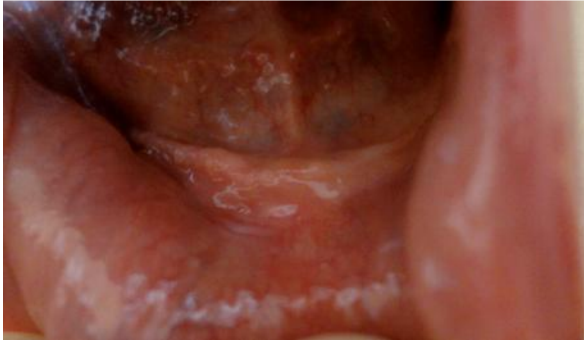

Figure 25.

Because of the immediate loading, the use of root-form implants seemed to be practical, and to avoid the thermodynamic extremes during the preparation of the bed, we planned to use small-diameter implants for the expected D1 bone quality. To retain the denture, we placed transgingivally (Figure 26) 3 Denti® R Ø3.3 implants (length: 13.5 mm) (Figures 27 and 28). After covering them with transgingival healing screws (Figure 29), we performed stability measurements, and the measured PTV (between −4.5 and −5.5) confirmed the possibility of immediate loading.

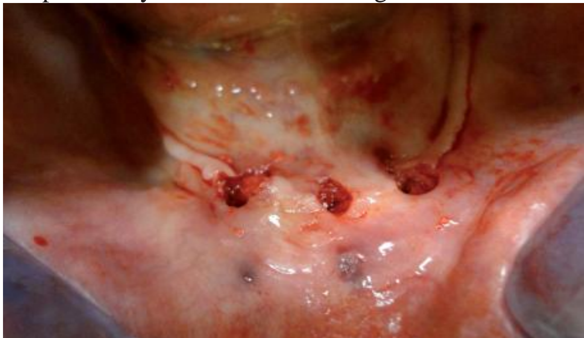

Figure 26.

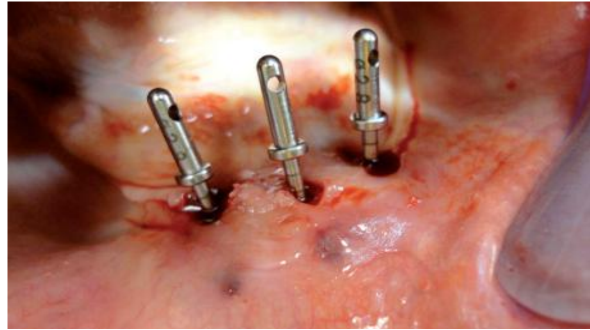

Figure 27.

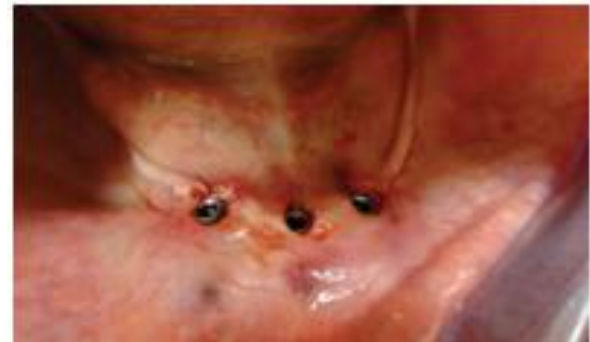

Figure 28.

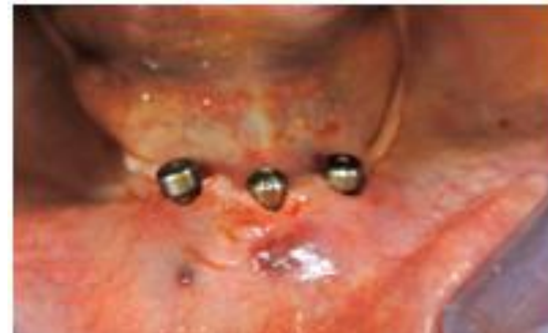

Figure 29.

One week later, an impression was taken, and after testing the bar (Figure 30), we constructed the denture (Figure 31).

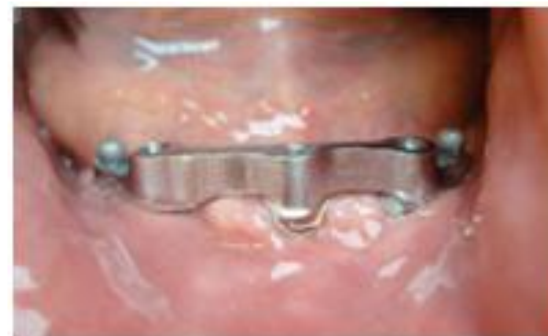

Figure 30.

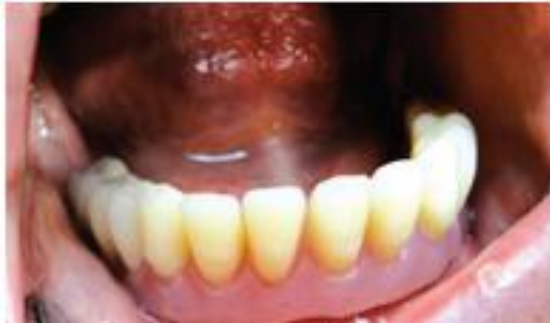

Figure 31.

Summary

Based on the presented cases, the Ø3.3 implants have a wide area of application in prosthetics. They can be used as abutment for prostheses retained in the frontal or molar regions, or to stabilize removable prostheses. The small apical diameter of the implant, its root-form shape, and the long, fine-pitch, shallow thread on the neck give the implant an exceptionally precise keeping of direction during placement. During the procedure combined with bone splitting, the same elements decreased the risk of bone plate fracture with a wedge effect distributed over a large surface, and led to a convincing primary stability. To sum up, we may conclude that if an implantologist, either a novice or an experienced one, wishes to use this implant, there will always be tasks that can be performed with less stress using the new Denti® implants.