Immediate Loading of Small Diameter Implants in Severely Atrophic Mandibles


Conventional mandibular dentures for patients with severely atrophic mandibles often present problems with retention, phonetics, function, and pain due to instability (1). Implant-supported overdentures have been successfully used to restore edentulous mandibles with implant-supported fixed bridges, hybrid prosthetic devices and removable overdenture prostheses (2). However, oral rehabilitation still fails to meet the requirements for implant-supported overdentures because of the high costs associated with the treatment (1). One of the main factors in this regard is the lack of sufficient bone volume for dental implant placement (3). Consequently, this limits the number of patients who are suitable candidates for dental implant treatment (1).

Small diameter implants (SDI) (MTI Mononail, Dentatus USA, New York, NY) with 1.8-mm diameters were introduced recently and used as transitional implants to support provisional restorations in a single-stage surgery and were designed to be immediately loaded (15-16). The transitional implants were successfully removed at the end of the provisionalization period. However, these small-diameter implants became enteroclogging with simultaneous improvement of bone-implant contact achieved as compared to standard-sized implants (17). Appropriate designs, material and surface of the SDI were fabricated by the new line of SDI were introduced by one manufacturer (Ankylos, Astra Dental, New York, NY), and approved for use as conventional implants. These implants are made of commercially pure titanium or titanium and are anodized to generate a hard oxide layer, cemented or attachment suppressive. These implants have a self-threading interpedicle screw design with diameter of 1.8 to 2.0 mm and embedment length between 7 and 14-20 mm.

The purpose of the present study was to investigate the use of immediately loaded small diameter implants to support overdentures in severely atrophic mandibles and report on implant/prosthesis survival rates and patient satisfaction.

MATERIALS AND METHODS

Implants were obtained from Anker Dental Implant Co (IDI) at the Department of Periodontics and Implant Dentistry New York University College of Dentistry (NYU/DID) center Dental. This data set was obtained as an identification from clinical information that were collected during the routine management of the patients. The IDD was certified by the Office of Quality Assurance at NYU/DID. This study is in compliance with the Health Insurance Portability and Accountability Act (HIPAA) requirements.

Between 2004 and 2009 in patients (3 males and 7 females), mean age of 52.85 range 20-70, provided 8 cases of 26 small diameter implants (2.0-mm, Allentown Dental Implant Co, Allentown, PA, USA). Johansson 1941-15-18 1H-37, Hogenberg, (Fig. 1). The instruction included of clinical and radiographs of patients were not satisfied with their conventional mandibular dentures because of lack of stability in function. Two of them are small diameter bone type implants made of titanium alloy were placed in the anterior mandibular area (between incisors) with flaps surgical procedures. Utilizing these SDI avoid the need for bone augmentation.

RESULTS

Table 1. Survival of implants placed in 10 patients

<table>
<thead>
<tr>
<th>Patient</th>
<th>Number of Implants</th>
<th>Implant Survival</th>
<th>Implant Function</th>
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<tbody>
<tr>
<td>P1</td>
<td>5</td>
<td>100%</td>
<td>100%</td>
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<tr>
<td>P2</td>
<td>5</td>
<td>92%</td>
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<td>P3</td>
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<tr>
<td>P10</td>
<td>5</td>
<td>100%</td>
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The above table demonstrates the overall survival rate of 94.1% and the implant survival rate of 100% (Table I). Ten patients presented successful osseointegration in the mandible with a minimal survival rate of 92.8% (18). Two implants failed due to the following reasons.

1. Patients had less bleeding during the surgery, and less post-operative discomfort and swelling.
2. The surgery was less time consuming and had less patient discomfort.
3. The surgical procedure was less time consuming and had less patient discomfort.
4. The procedure was less time consuming and had less patient discomfort.

CONCLUSION

PDIEs have shown excellent clinical outcomes in severely atrophic mandibles. The use of small diameter implants provided immediate occlusal loading function and a high survival of SDI (94.1%) and prostheses (100%). Patients using SDI supported dentures reported an increased comfort, function, stability, fit, occlusion, satisfaction, physical and social life over an average of 11.8 months (range: 6-28 months). In the present study, PDIEs placed with flaps surgery in severely atrophic mandibles had the following advantages.

1. Immediate loading of transitional dentures provided immediate occlusal loading function and a high survival rate of SDI (94.1%) and prostheses (100%).
2. Patients reported less pain and improved aesthetics, function, and stability.
3. The surgery was less time consuming and had less patient discomfort.
4. The procedure was less time consuming and had less patient discomfort.

In conclusion, the use of immediately placed small diameter implants to support removable overdentures in the mandible has shown excellent results. Further studies are required to determine long-term success and predictability of this treatment modality.

S. Reference