Survival rate of imPlasa dental implant system: long-term results

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Background

The imPlasa Hoechst implant system is characterized by sand blasted and acid-etched surface, internal connection and self-tapping thread. They are manufactured from high-quality titanium alloy Ti6Al4V ELI. Milled titanium parts are blasted with wet alumina and titanium particles sized 25 µm and 75 µm. After the implants are etched using the immersion method for several minutes in a mixture of concentrated HCl and H2SO4 heated above 100°C (dual acid etching). The dual acid-etched surface enhances the osteoconductive features through the attachment of fibrin and osteogenic cells, resulting in bone formation directly on the surface of implant. The dual acid-etched surface provides optimal surface charecteristics required for enhanced osseointegration. In 2012 we presented an analysis of imPlasa implants' survival rate in a short-term period. In February - March 2017 we did the analysis of imPlasa implants long-term survival rate involving the patients who had implants placed between May 2008 - March 2011. The results are provided in this paper.

Aim

The aim of the present study was to retrospectively evaluate the long-term survival rate of imPlasa implants.

Methods and Materials

637 implants were inserted in 127 patients between May 2008 and March 2011 in a private dental implant clinic. Associated factors, such as the patients characteristics, distribution of implants, survival rate, treatment type, were analyzed. The study excluded patients with a poor level of oral hygiene, with exacerbation of chronic periodontitis, decompensated diabetes and patients taking immunosuppressive drugs, undergoing radiation therapy. Each patient was given a full examination of the oral cavity and underwent X-ray imaging of the teeth. When necessary, in order to clarify the indications and careful treatment planning, CT scan was performed. The observations were carried out on a single protocol, which was formed by a database of patients, operations and results of examinations of the criteria for success of implant treatment according to Albrektsson et al. All patients have taken antibiotics and anti-inflammatory drugs immediately after implant placement. Treatment of a specified number of patients has been performed following a two-stage procedure. The placement of healing abutments started after 3 months on the lower jaw and 6 months on the upper jaw. In the cases of implant placement accompanied by open sinus membrane lifting surgery the osseointegration period was extended to 8 months. Fixed and removable provisional prostheses were made not earlier than 3 weeks after surgery. Removable prostheses were made as they do not press on the operated areas. Patients were advised to limit the usage of provisionals mainly to cosmetic purposes.

Results

1. Patient characteristics: 127 patients were treated with imPlasa implants.
2. The reason of tooth loss was periodontal problems (67%), caries complications (7%), tooth fractures (13%) etc.
3. 37 patients were heavy smokers.
4. 43 sinus floor elevations were performed on 34 patients (23 open and 20 closed surgeries).
5. From the total number of treated patients 92 had implants placed on the maxilla and 82 on the mandible. 386 implants were placed in the anterior region, 251 implants in the posterior.
6. The number of implants placed on the upper jaw was 314.
7. The number of implants placed on the lower jaw was 323.
8. The most commonly used implant diameters were 3.75 mm (278) and 4.2 mm (277).

References

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9. The most commonly used length was 13 mm.
10. 25% of implants were restored by a single crown, 75% by bridge type fixed prostheses or overdentures.
11. 33 implants failed in 24 patients 8 of which were heavy smokers. 10 implants didn't osseointegrate. Eventually most of the lost implants were successfully replaced.
12. The greatest number of failed implants was observed in the area of teeth #26, 36, 46 (12 cases) which was due to the poor bone quality.
13. All of the osseointegrated implants were subsequently loaded.
14. The overall survival rate for the long-term analysis was 94.8%.

Number of placed/failed implants by diameter

Implants diameter in mm	Number of inserted implants	Percent age of inserted implants %	Number of failed implants short-term	Percent age of failed implants short-term	Number of failed implants long-term	Percent age of failed implants long-term
3.3	35	5.5%	1	2.8%	5	14.3%
3.75	278	43.6%	6	2.2%	15	5.4%
4.2	276	43.3%	1	0.3%	4	1.45%
5.0	47	7.4%	5	10.6%	9	19.2%
6.0	6	0.2%	-	-	-	-
Total	637	100%	13	2.1%	33	5.2%

Number of placed/failed implants by length

Implants length in mm	Number of inserted implants	Percent age of inserted implants %	Number of failed implants short-term	Percent age of failed implants short-term	Number of failed implants long-term	Percent age of failed implants long-term
8	47	7.37%	-	-	5	10.6%
10	130	20.4%	3	2.3%	6	4.6%
11.5	178	28%	6	3.4%	13	7.3%
13	202	31.7%	3	1.5%	7	3.5%
16	80	12.55%	1	1.25%	2	2.%
Total	637	100%	13	2.1%	33	5.2%

Conclusions

With survival rate of 94.8% ImPlasa dental implants showed excellent performance and predictability in this long-term retrospective study.