Scientific summary

Clinical performance of two-piece zirconium implants in the posterior mandible and maxilla: a prospective cohort study over 2 years

Becker J, John G, Becker K, Mainusch S, Diedrichs G, Schwarz F. Clinical performance of two-piece zirconium implants in the posterior mandible and maxilla: a prospective cohort study over 2 years. Clin. Oral Impl. Res. 28, 2017, 29–35 doi: 10.1111/clr.12610

Scope

The objective of this prospective cohort study was to assess the clinical performance of the Patent™ (ZV-3) 2-piece implant system over a period up to 2 years. 52 patients with single tooth gaps in the **posterior** maxilla or mandible received implant therapy with a conventional loading protocol. The primary outcome of the study was survival rate. Covariates examined were gender, implant position, implant diameter/length and oral surgeon.

4 of the 52 patients were lost for follow-up so the data is based on 48 patients. Implant diameters were 4.5 mm and 5.0 mm, lengths were 9, 11 and 13 mm. **Simultaneous grafting of buccal dehiscences and internal sinus lifts were performed when necessary.** In one case, an external sinus lift was performed and implant placed 4-6 months after healing. Three experienced and calibrated surgeons performed all surgeries.

Implant survival was defined as that the implant was present at the final examination after 24 months. Maintenance care was provided according to individual needs at 3, 6, 12, 18 and 24 months after therapy. Clinical measurements were performed at six aspects of each implant for plaque index (PI), bleeding on probing (BOP), probing depth (PD) and mucosal recession (MR).

Patient demographics and implant site characteristics	
Patient number (n)	**48**
Female	31
Male	17
Age (years)	47.6 ± 13.4
Observation period (months)	25.5 ± 5.8
Patients with multiple implant sites	15
Patients with 1/2/3 implants	33/10/5
Patients treated by surgeon 1/2/3	7/29/12
Target implant sites	48
Location upper jaw	13
Location lower jaw	35
Implant diameter (4.5/5.0 mm)	17/31
Implant lenght (9/11/13)	2/45/1
Target implant sites with augmentation	19
Simultanious grafting of a dehiscence-type defect	12
Internal sinus floor elevation	6
External sinus floor elevation	1

Key take aways

- **No implant fractures were reported.**
- **Implant survival rate was high, 95.8%.**
- **Simultaneous bone augmentations and direct sinus lifts did not impact survival rates.**
- **There was a statistically significant association of implant failure with one of the surgeons.**
- **Implants examined with X-rays reveal minor crestal bone level changes.**
- **The volume of keratinized gingiva increased over time. MR values decreased reaching a statistically significance over 24 months.**
- **BOP scores increased initially but reduced to baseline values after 24 months after non-surgical treatment procedures to clean the pockets.**
- **One crown and glass fiber post fractured giving a prosthetic complication rate of 2.1%.**

“Within the limitations of a prospective cohort study, it was concluded that this two-piece zirconia implant/fiberglass abutment system can be successfully used in the clinical indication investigated.”

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