

Implant rehabilitation of extremely atrophic mandibles (cawood and howell class VI) with a fixed-removable solution supported by four implants: one-year results from a preliminary prospective case series study

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Purpose

The objective of this study was to report one-year preliminary data on Cawood and Howell Class VI patients rehabilitated with a fixed-removable solution. Completely edentulous patients, aged 18 years or older, presenting with severely atrophic mandibles (Class VI according to Cawood and Howell) were enrolled and treated using four implants, a CAD/CAM titanium bar and a low-profile attachment system to support an implant-supported overdenture.

Materials & Methods

Study design : Prospective case series study

Subjects and Outcomes of the study

- Period : From September 2015 to February 2016 (13.8 M F/up after loading)
- Patients: Four consecutive edentulous participants (All of the treated patients were female with an average age of 71.5 (range: 64-82)
- Implants : 16 Osstem TSIII implants
- Outcome measures : success rates of the implants and prosthesis, complications, marginal bone level changes, bleeding index, plaque index and patient satisfaction (Oral Health Impact Profile).

Results

Implant & prosthetic survival rates of 100%, implant & prosthetic success rates of 100%. At the one-year follow-up, the mean marginal bone loss was 0.23 ± 0.07 mm.

No participants dropped out, and no deviation from the original protocol occurred. At the one-year follow-up, no implants or prosthesis had failed. No biological or technical complications occurred during the follow-up. The Oral Health Impact Profile summary scores demonstrated a significant decrease throughout the study, from 66.5 ± 3.7 to 19.3 ± 2.8 . At the one-year follow-up, the bleeding index was 1.6% and the plaque index was 4.7%.

Table 1. Characteristics and results of included patients/implants.

	Age (years)	Sex	Smoking	Implants	Implants 7mm length	Implants 8.5mm length	Implants 10mm length	Implants 3.5mm wide	Implants ≥ 4 mm wide	Failed implant	Failed prosthesis	MBL (mm)	CHIP T0	CHIP T1	BI	PI
Patient 1	64	F	0	4	0	0	4	0	4	0	0	0.16	71.0	22.0	0/16	1/16
Patient 2	82	F	0	4	2	2	0	2	2	0	0	0.26	63.0	21.0	1/16	0/16
Patient 3	68	F	0	4	0	2	2	0	4	0	0	0.19	68.0	16.0	0/16	2/16
Patient 4	72	F	0	4	0	0	4	0	4	0	0	0.32	64.0	18.0	0/16	0/16
Total		4F/0M	0	16	2	4	10	2	14	0	0				1/64 (1.6%)	3/64 (4.7%)
Mean \pm SD	71.5	± 7.7										0.23 ± 0.07	66.5 ± 3.7	19.3 ± 2.8		

MBL = Marginal bone loss; CHIP = Oral health impact profile; T0=Baseline; T1 = One year after definitive prosthesis delivery; BI = Bleeding index; PI = Plaque index; SD = Standard deviation.



Fig. 1. CAD/CAM titanium bar.

Fig. 2. Metallic counterpart of the overdenture.



Figs. 3a-c Clinical view of the overdenture at the time of prosthesis delivery (a & b) and radiographic view early after final prosthesis delivery (c).

Conclusion

Within the limitations of this study, a mandibular overdenture fully supported by four implants and a CAD/CAM titanium bar with a low-profile attachment system can be considered an effective and predictable option for patients with Cawood and Howell Class VI atrophic mandibles. Minimum marginal bone remodeling, good periodontal parameters and patient satisfaction can be expected.