Clinical performance and survival rate of mandibular overdentures retained by two implants: a case series

Henriques I.¹; Pinto, C.¹; Lagrange, J.²; Fialho, J³; Chen A.⁴; Francisco, H.⁴
Caramês, J.⁵

¹ Resident at Postgraduation Course in Oral Surgery, University of Lisbon Faculty of Dental Medicine
² Invited Assistant at the Postgraduate program in Oral Surgery and Implantology, University of Lisbon Faculty of Dental Medicine
³ Adjunct Professor, Instituto Politécnico de Viseu (IPV) e CI&DETS (Centro de Estudos em Educação, Tecnologias e Saúde)
⁴ Assistant Professor at the Oral Surgery and Implant Dentistry Department at University of Lisbon Faculty of Dental Medicine
⁵ Full Professor at the Oral Surgery and Implant Dentistry Department at University of Lisbon Faculty of Dental Medicine

Abstract

BACKGROUND: Implant therapy with two implants placed in the edentulous mandible to support a removable overdenture has been considered a safe and predictable treatment modality. It shows positive results in terms of increasing prosthesis stability and retention and consequently improving the chewing function and patient’s quality of life.

PURPOSE: The aim of this study was to describe a series of cases of mandibular overdentures retained by two unsplited implants and evaluate their survival rate.

MATERIALS AND METHODS: A retrospective case series of 13 patients rehabilitated with mandibular overdentures retained by two implants, at a Post-graduation Clinic in Lisbon between October 2017 and April 2019, was performed. Demographic data (age and gender), patient motivation and status of the prior dentition were described. The following aspects related to the rehabilitation were also registered: brand, number, diameter and length of the implants, prosthetic restoration (fabrication of a new immediate prosthesis or adaptation of the old one), number of appointments after loading, complications, necessity of rebase, frequency of changing rubers, among others.

The clinical protocol consisted of 2 implants placed at 32 and 42 positions to retain a mandibular overdenture with the connection of Locator attachments (torqued to 25Ncm). Descriptive statistical analysis was performed.

RESULTS: The sample was composed by 13 patients (53,8% women and 46,2% men), with mean age 65.38 years +/- 2,505 (53-79 years). During the period of 31 months, 26 implants (76,9% Brånemark System MkIIITiUnite, Nobel Biocare™ and 23,1% TSIII SA FIXTURE, OSSTEM) with diameter from 3.3 to 4mm (media of 3,76 +- 0,05) and length from 8.5 to 13mm (media of 11,85 +-0,24) were placed in 32 and 42 positions to retain mandibular overdentures. Till date all implants remained osteointegrated and so the survival rate is 100%.

In 9 patients an immediate loading protocol was used (61,5%, with an insertion torque>32Ncm) with the immediate connection of the attachments and overdenture placement. In 2 of them the old prosthesis was temporary adapted and in 7 a new immediate prosthesis was fabricated. All prosthetic restorations were still functionally in place at the last follow-up appointment.

CONCLUSIONS: The results of this case series suggest that favorable implant survival rates can be achieved with mandibular overdentures retained by two implants. An improvement in edentulous patients quality of life can be achieved with this treatment modality.

Results

ID	Gender	Age (years old)	Implants's Brand		Diameter (mm)	Length (mm)	Immediate loading Protocol		
1	Masc	79	Mk III TiUnite (Nobel) HE		4	13	Yes		
			Mk III TiUnite (Nobel) HE		4	13			
2	Masc	53	Mk III TiUnite (Nobel) HE		4	11.5	No		
			Mk III TiUnite (Nobel) HE		4	11.5			
3	Fem	62	Mk III TiUnite (Nobel) HE		3.75	11.5	Yes		
			Mk III TiUnite (Nobel) HE		3.75	11.5			
4	Fem	66	Mk III TiUnite (Nobel) HE		3.3	11.5	Yes		
			Mk III TiUnite (Nobel) HE		3.75	11.5			
5	Fem	56	Mk III TiUnite (Nobel) HE		3.3	13	Yes		
			Mk III TiUnite (Nobel) HE		3.3	13			
6	Masc	74	Mk III TiUnite (Nobel) HE		3.3	13	No		
			Mk III TiUnite (Nobel) HE		3.3	13			
7	Fem	74	Mk III TiUnite (Nobel) HE		4	8.5	Yes		
			Mk III TiUnite (Nobel) HE		4	8.5			
8	Masc	54	TSIII SA FIXTURE (OSSTEM)		3.75	13	No		
			TSIII SA FIXTURE (OSSTEM)		3.75	13			
9	Fem	55	TSIII SA FIXTURE (OSSTEM)		3.75	11.5	Yes		
			TSIII SA FIXTURE (OSSTEM)		3.75	11.5			
10	Fem	68	TSIII SA FIXTURE (OSSTEM)		4	11.5	Yes		
			TSIII SA FIXTURE (OSSTEM)		4	11.5			
11	Masc	62	Mk III TiUnite (Nobel) HE		3.75	11.5	No		
			Mk III TiUnite (Nobel) HE		3.75	11.5			
12	Fem	72	Mk III TiUnite (Nobel) HE		3.75	11.5	No		
			Mk III TiUnite (Nobel) HE		3.75	11.5			
13	Masc	75	Mk III TiUnite (Nobel) HE		4	13	Yes		
			Mk III TiUnite (Nobel) HE		4	13			
ID	Prosthesis fabrication / adaptation		Implant's Survival Rate (%)	Follow up (months)	Definitive Prothesis's Survival Rate (%)	Follow up (months)	Attachment housings changes after Definitive Prosthesis (months)		Rebase / relining after Definitive Prosthesis (months)
1	New immediate prosthesis	100%	20	100%	20	20	5		
		100%		100%					
2	New immediate prosthesis	100%	26	100%	20	12	-		
		100%		100%					
3	Old temporary adapted prosthesis	100%	13	100%	8	8	-		
		100%		100%					
4	New immediate prosthesis	100%	12	100%	12	4	-		
		100%		100%					
5	New immediate prosthesis	100%	24	100%	24	16	7		
		100%		100%					
6	New immediate prosthesis	100%	12	100%	4	-	-		
		100%		100%					
7	New immediate prosthesis	100%	20	100%	20	5	-		
		100%		100%					
8	New immediate prosthesis	100%	9	100%	1	-	-		
		100%		100%					
9	Old temporary adapted prosthesis	100%	3	100%	1	-	-		
		100%		100%					
10	New immediate prosthesis	100%	26	100%	26	18	9		
		100%		100%					
11	New immediate prosthesis	100%	24	100%	22	6, 17	12		
		100%		100%					
12	New immediate prosthesis	100%	28	100%	21	17	-		
		100%		100%					
13	New immediate prosthesis	100%	24	100%	19	10	14		
		100%		100%					

Background and Aim

Total edentulism remains a global health problem and its prevalence is expected to increase together with life longevity¹. When compared to conventional dentures, two implant retained overdentures performs better in terms of denture stability, chewing function and in patient-centered outcomes; ^{2,3} when compared to multiple splinted implants also has been proved to be as effective ⁴. Regarding Immediate or delayed loading of mandibular overdentures, both options are well documented and validated in literature, with similar clinical outcomes ^{1, 5}. The aim of this single center retrospective case series study was to evaluate the survival rate of mandibular overdentures retained by two unsplited implants.

Conclusion

Within the limitations of this case series study, the results suggest that favorable implant survival rates can be achieved with mandibular overdentures retained by two implants. An improvement in edentulous patients' quality of life can be achieved with this treatment modality.

Methods and Materials

A retrospective case series of 13 patients rehabilitated with mandibular overdentures retained by two implants, at a Post-graduation program at University of Lisbon between October 2017 and April 2019, was performed. The statistical analysis was descriptive.

Clinical Protocol: 2 implants placed at 32 and 42 positions to retain a mandibular overdenture with Locator abutment type of connection.

References

1| Salman, A, Thacker, S, Rubin, S, Dhingra, A, Ioannidou, E, Schincaglia, GP. Immediate versus delayed loading of mandibular implant-retained overdentures: A 60-month follow-up of a randomized clinical trial. J Clin Periodontol. 2019; 46: 863– 871; 2| Awad, M. A., Rashid, F., Feine, J. S., & Overdenture Effectiveness Study Team Consortium (2014). The effect of mandibular 2-implant overdentures on oral health-related quality of life: An international multicentre study. Clinical Oral Implants Research, 25(1), 46–51. <https://doi.org/10.1111/clr.12205>; 3| Heydecke, G., Thomason, J. M., Awad, M. A., Lund, J. P., & Feine, J. S. (2008). Do mandibular implant overdentures and conventional complete dentures meet the expectations of edentulous patients? Quintessence International, 39(10), 803–809; 4| Kern, J-S, Kern, T, Wolfart, S, Heussen, N. A systematic review and meta-analysis of removable and fixed implant-supported prostheses in edentulous jaws: post-loading implant loss. Clin. Oral Impl. Res. 27, 2016, 174– 195; 5| Rignon-Bret C, Wulfman C, Hadida A, Renouard F, Gourraud PA, Naveau A. Immediate Loading of Two Unsplinted Implants in Edentulous Patients with Mandibular Overdentures: A 10-year Retrospective Review of Patients from a Previously Conducted 1-year Cohort Study. Int J Oral Maxillofac Implants. 2019 Jan/Feb;34(1):169-178.