

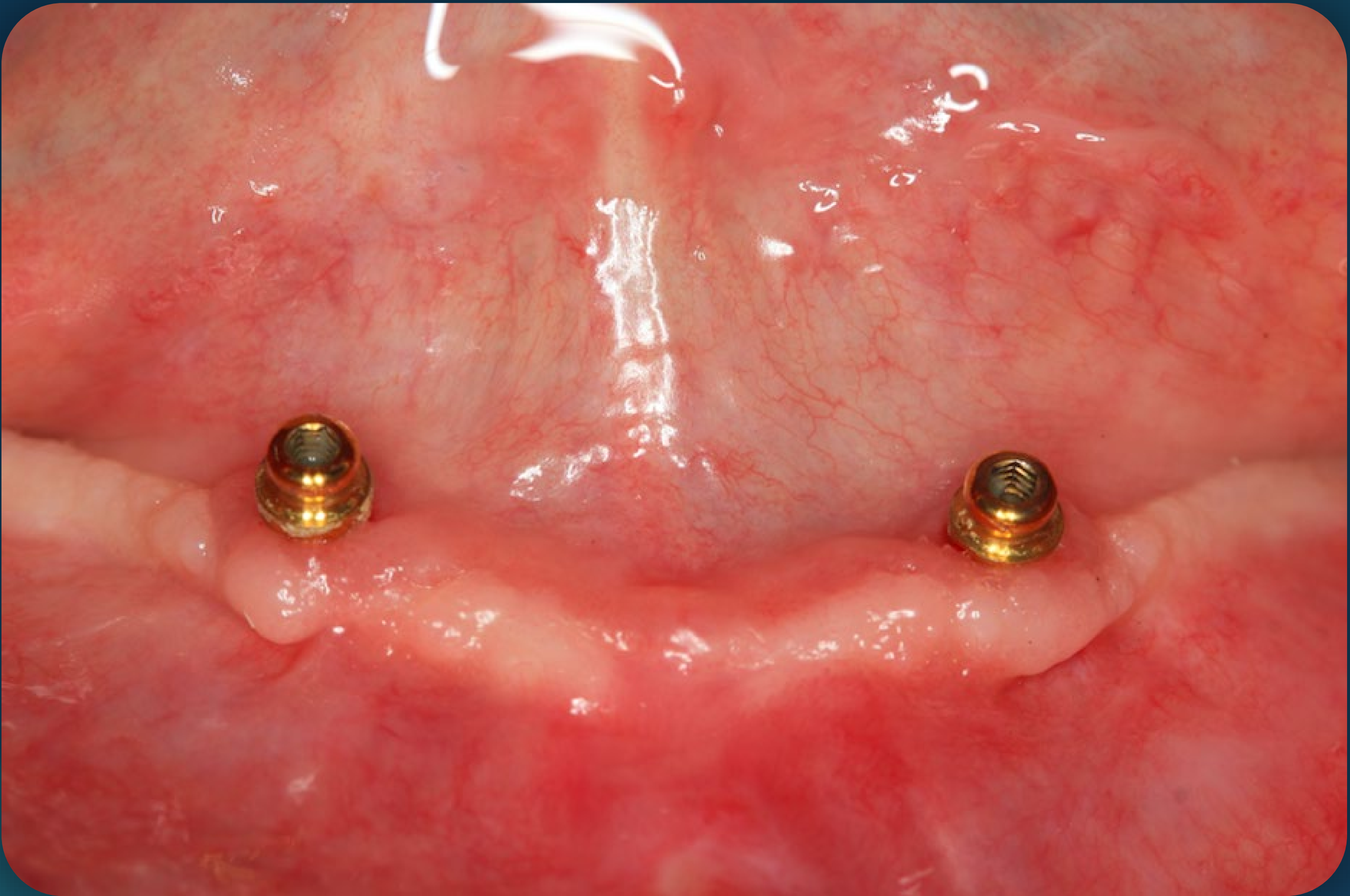
IMPACT OF MANDIBULAR OVERDENTURE USE ON CLINICALLY RELATED AND PATIENT-CENTERED OUTCOMES – A 5-YEAR PROSPECTIVE STUDY

Morel, Laura L.¹; Da Silva, Lucas J.¹; Rose Buchnveitz Salybi, Salma²; Pinto, Luciana D.²; Possebon, Anna Paula D.²; Chagas Junior, Otacílio L.²; Faot, Fernanda².

¹PhD Student, UFPel, Pelotas, Brazil; ²PhD, UFPel, Pelotas, Brazil.



BACKGROUND



Mandibular overdentures supported by two implants (OM2) **provide a rehabilitative solution that improves comfort, masticatory function, and quality of life** for edentulous patients.



The **Equator attachment** system retained by narrow-diameter implants still lacks evidence regarding its long-term performance.

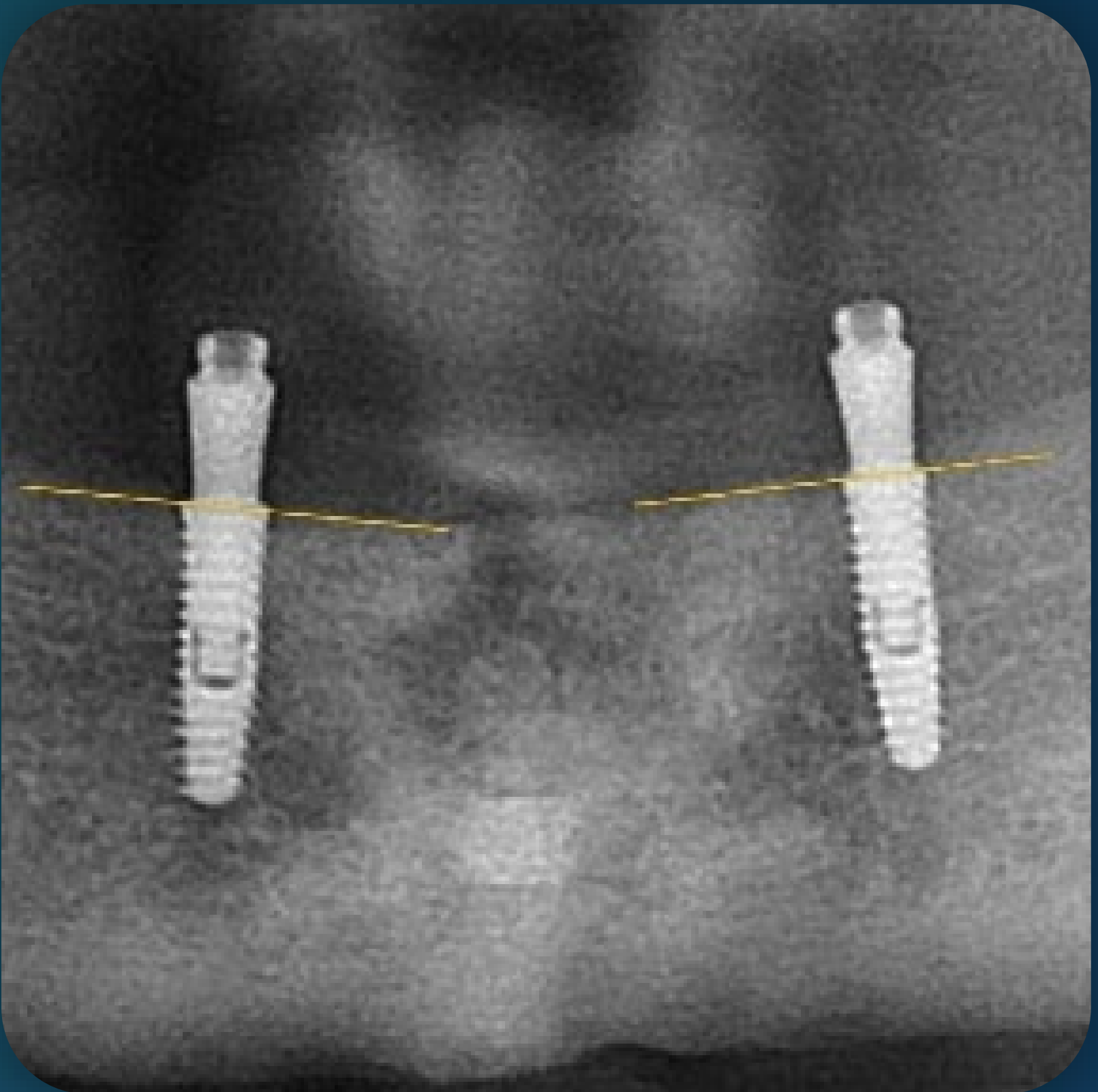
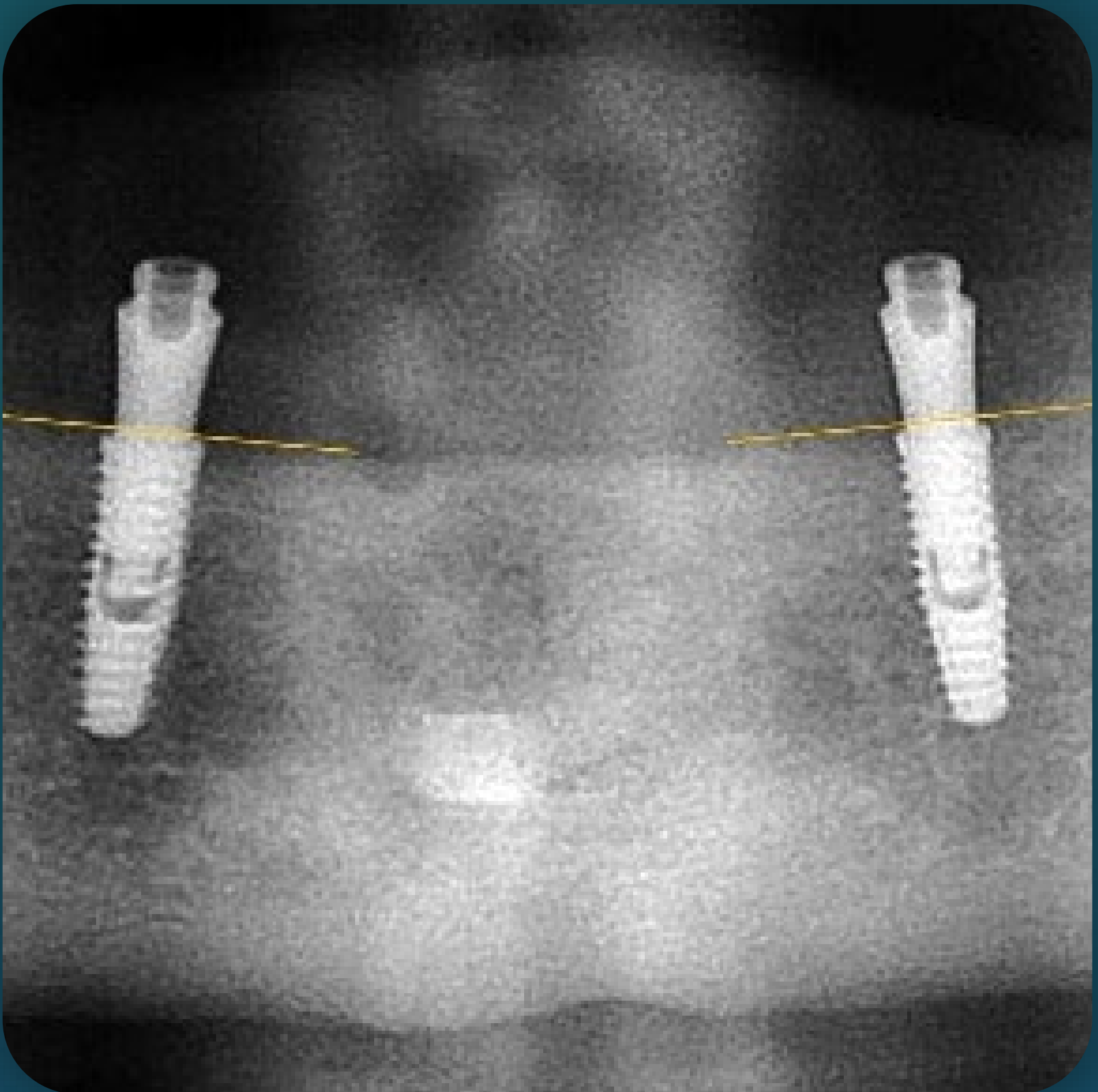


Marginal bone loss and frequent maintenance requirements **may compromise patient satisfaction** and quality of life.



What are the clinical and radiographic performance and the changes in patient-reported perception in OM2 users rehabilitated with the Equator attachment system over 5 years?

OBJECTIVE



The objective was to evaluate, over a 5-year period, the **clinical and radiographic performance and changes in quality of life**, as well as to **quantify prosthetic component longevity**, record maintenance events, and investigate the impact of patient-related variables on marginal bone loss.

Study design



Prospective longitudinal clinical study
5-year follow-up, annual assessments

Sample



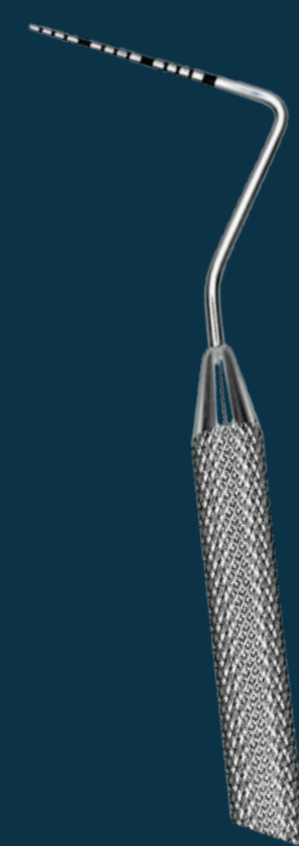
42 edentulous patients initially rehabilitated
Two narrow-diameter implants (2.9 × 10 mm) placed in the interforaminal region
Mandibular denture converted to implant-retained overdenture (OM2)
29 patients (58 implants) completed 5-year follow-up

Outcomes assessed



Clinical

Visible plaque index (VPI)
Gingival index (GI)
Bleeding index (BI)
Probing depth (PD)



Patient-reported - OHIP-EDENT/ Domains

1. Functional limitation
2. Physical pain
3. Psychological discomfort
4. Physical disability
5. Psychological disability
6. Social disability
7. Handicap

Radiographic

Marginal bone loss (MBL):
- **mesial and distal faces**
- Digital panoramic radiographs
- Measurements performed with ImageJ

Prosthetic maintenance events

Attachment and o-ring replacement
repairs, relines, recaptures, surgical
interventions

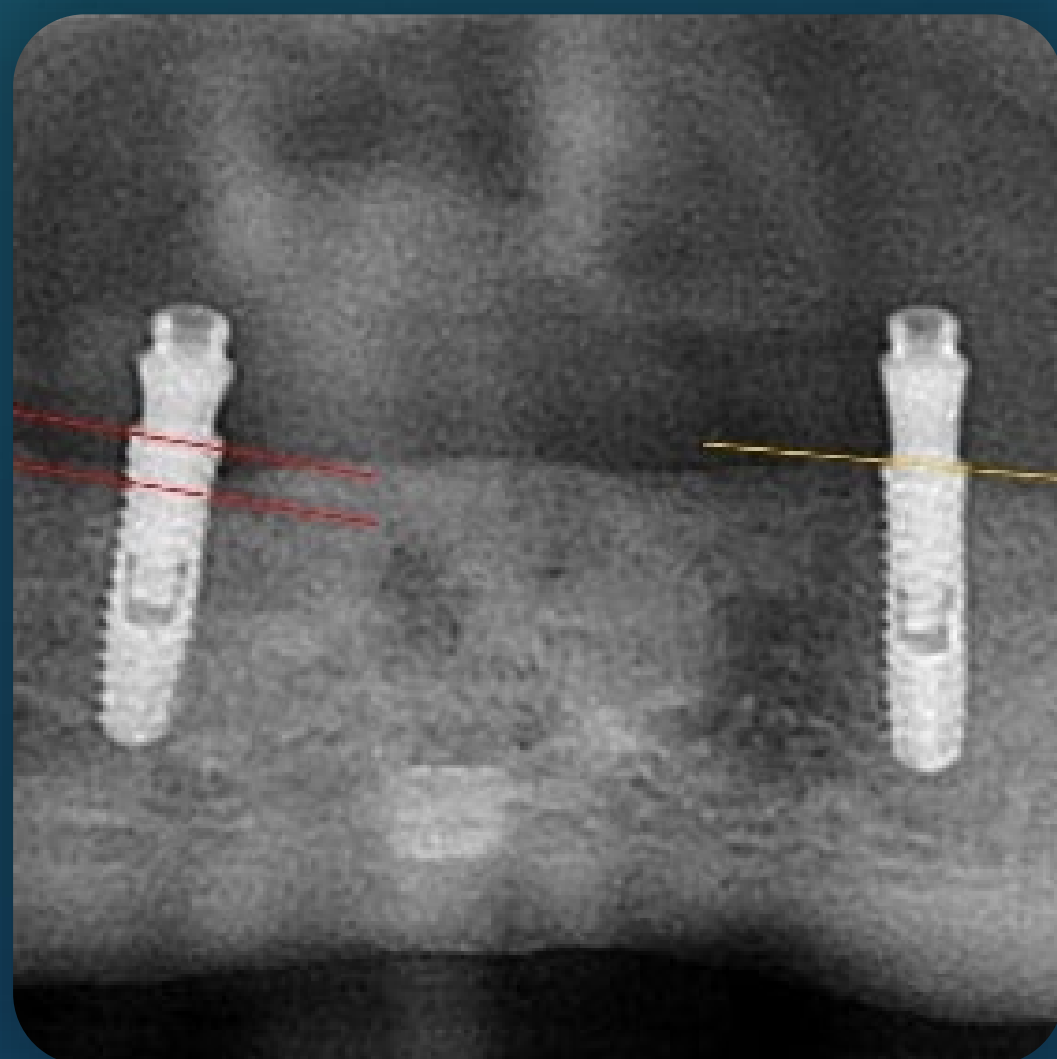
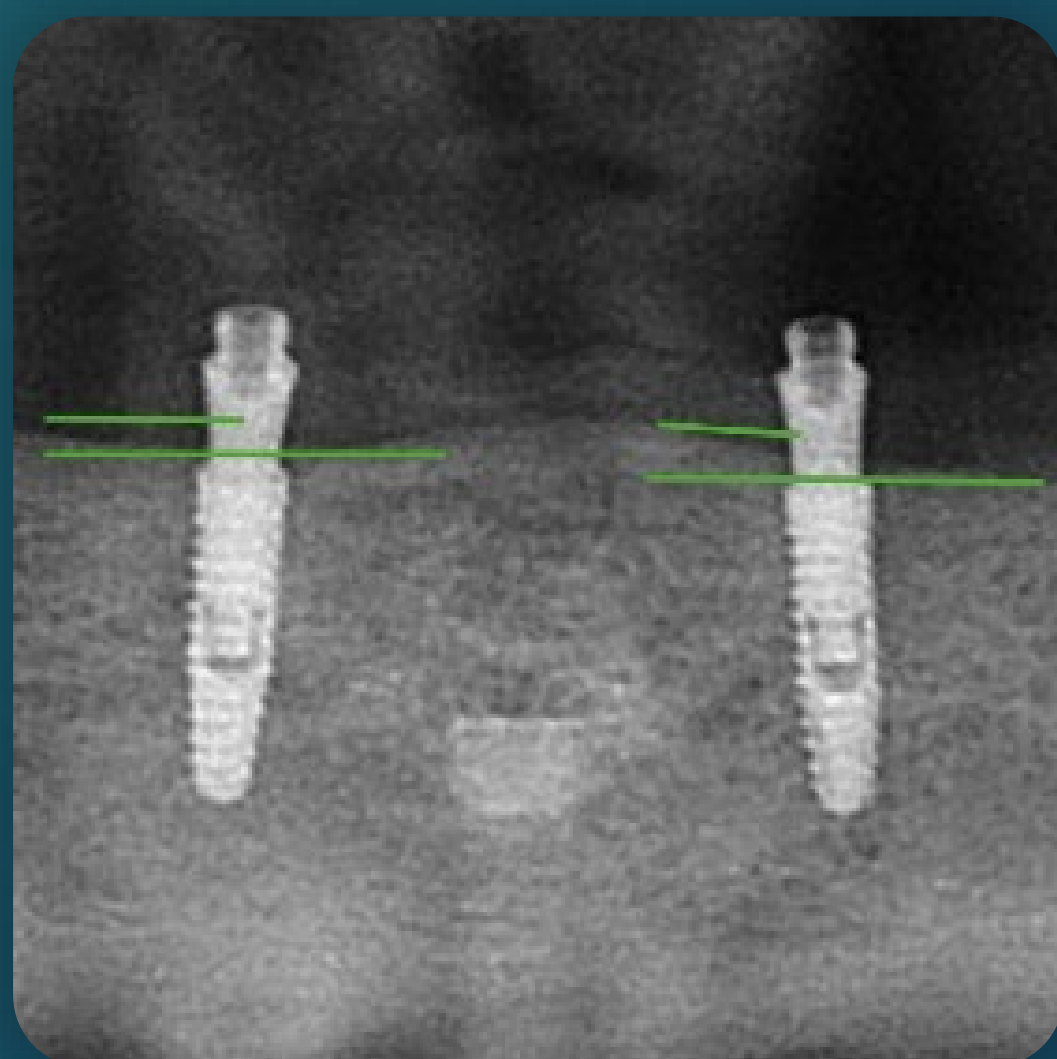
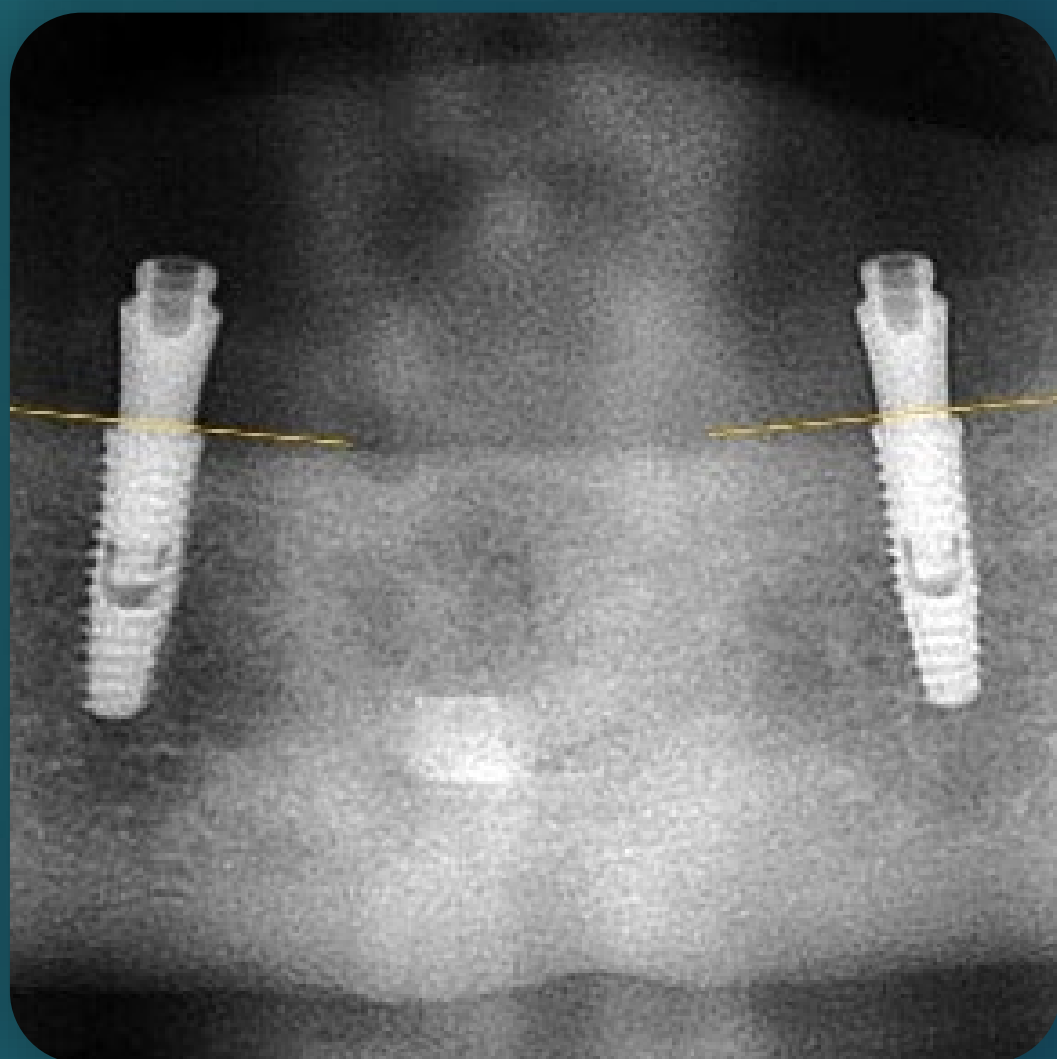
Statistics



Multilevel mixed-effects linear regression
Multivariate linear regression
Chi-square test
Kaplan–Meier survival analysis
Significance level: **p ≤ 0.05**



Equator-Facility





Sample characterists

42
patients

66,76 years
Mean age

66,7%
Women

50%
>65 years

13
Follow-up loss

58
Implants evaluated
in 5th year

Clinical Parameters

	Value [mean (SD)]					Comparison between years (p-value)			
	1 year	2 year	3 year	4 year	5 year	5-1	5-2	5-3	5-4
Peri-implant Health									
Visible plaque index	0.00 ±0.00	0.60 ±0.71	0.66 ±0.90	0.30 ±0.56	0.35 ±0.63	0.25	0.84	0.47	0.00*
Gingival inflammation	0.17 ±0.46	0.11 ±0.36	0.15 ±0.46	0.20 ±0.44	0.20 ±0.48	0.41	0.00*	0.03*	0.11
Presence of calculus	0.00 ±0.00	0.03 ±0.19	0.00 ±0.00	0.03 ±0.17	0.11 ±0.32	**	0.50	**	0.65
Probing depth	1.74 ±0.70	1.88 ±0.74	2.04 ±0.76	1.89 ±0.47	1.71 ±0.48	0.00*	0.35	0.15	0.00*
Gingival bleeding index	0.04 ±0.22	0.05 ±0.23	0.09 ±.38	0.27 ±.55	0.19 ±0.51	0.32	0.00*	0.86	0.00*

*Statistically significant difference (p ≤ 0.05); **Collinearity; constant variables.

Oral health–related quality of life (OHRQoL)

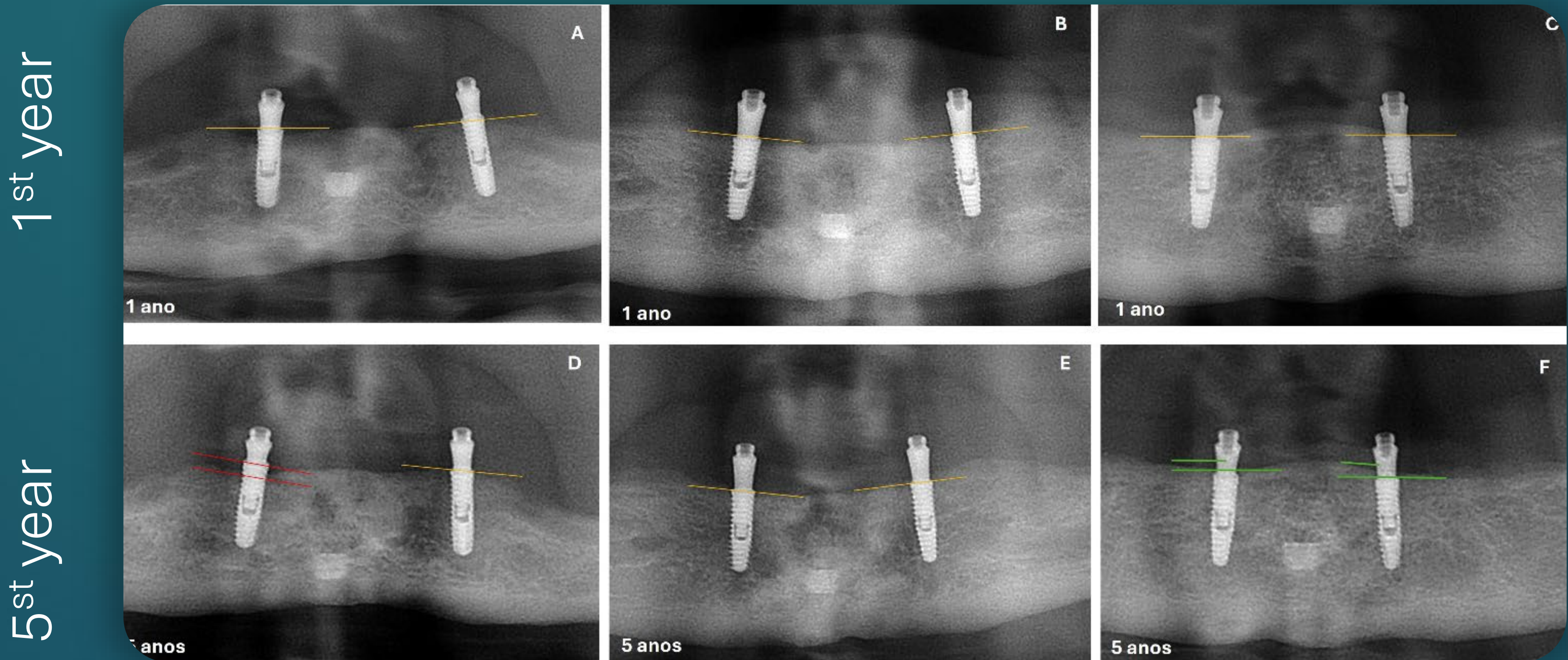
	Score [mean (SD)]					Comparison between years (p-value)			
	1 year	2 year	3 year	4 year	5 year	5-1	5-2	5-3	5-4
OHIP-Edent (domains)									
Functional limitation	1.12 ±1.12	1.34 ±1.64	1.58 ±1.55	1.67 ±1.59	2.92 ±1.74	0.11	0.54	0.80	0.57
Physical pain	0.63 ±1.04	0.81 ±1.48	0.94 ±1.47	1.22 ±1.80	2.28 ±2.05	0.31	0.41	0.95	0.10
Psychological discomfort	0.14 ±0.52	0.34 ±0.70	0.38 ±1.04	0.29 ±0.64	1.07 ±1.15	0.85	0.04*	0.22	0.11
Physical disability	0.31 ±0.87	0.39 ±0.75	0.58 ±0.96	0.48 ±1.17	0.96 ±1.47	0.00*	0.00*	0.01*	0.06
Psychological disability	0.09 ±0.37	0.18 ±0.51	0.16 ±0.56	0.09 ±0.30	0.50 ±0.74	0.22	0.18	0.29	0.29
Social disability	0.07 ±0.26	0.00 ±0.00	0.08 ±0.50	0.00 ±0.00	0.03 ±0.18	0.77	0.30	**	**
Handicap	0.12 ±0.64	0.07 ±0.35	0.22 ±0.68	0.06 ±0.24	0.10 ±0.31	0.00*	0.00*	0.01*	0.06
Overall	2.51 ±3.80	3.15 ±4.74	3.91 ±5.62	3.80 ±4.67	7.89 ±5.8	0.03*	0.02*	0.24	0.95

*Statistically significant difference (p ≤ 0.05); **Collinearity; constant variables.

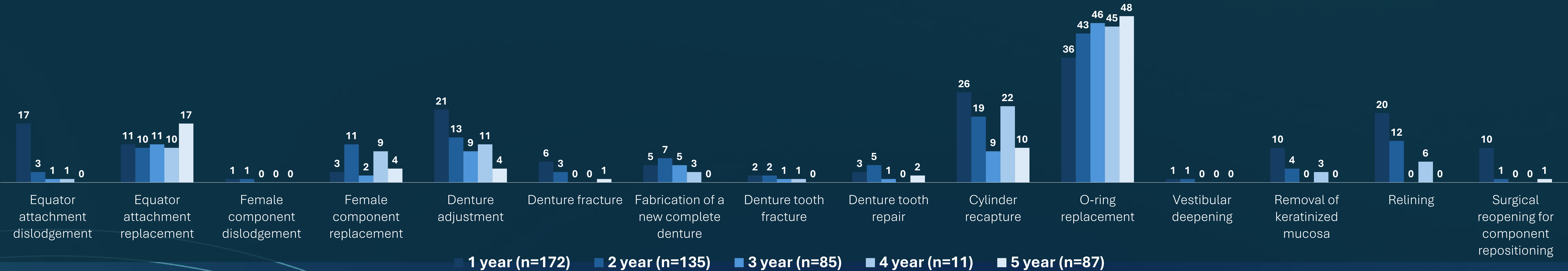
Radiographic assessment

	Marginal Bone Loss [mean (DP)]					Bone remodeling – (5 vs. 1) (number of implant surfaces)		
	1 year	2 year	3 year	4 year	5 year	Gain	Loss	Stable
Mesial	0.06 ±0.66*	0.04 ±0.70*	0.12 ±0.69*	0.14 ±0.65*	0.08 ±0.70*	29	24	5
Distal	-0.07 ±0.66	-0.05 ±0.78	-0.07 ±0.72	-0.01 ±0.69*	-0.07 ±0.73*	30	20	8
Overall	-0.00 ±0.60	-0.00 ±0.69	0.02 ±0.65*	0.06 ±0.62*	0.00 ±0.67*	59	44	13

*Statistically significant difference (p ≤ 0.05).



Prosthetic maintenance regimen (n = total number of events per year)

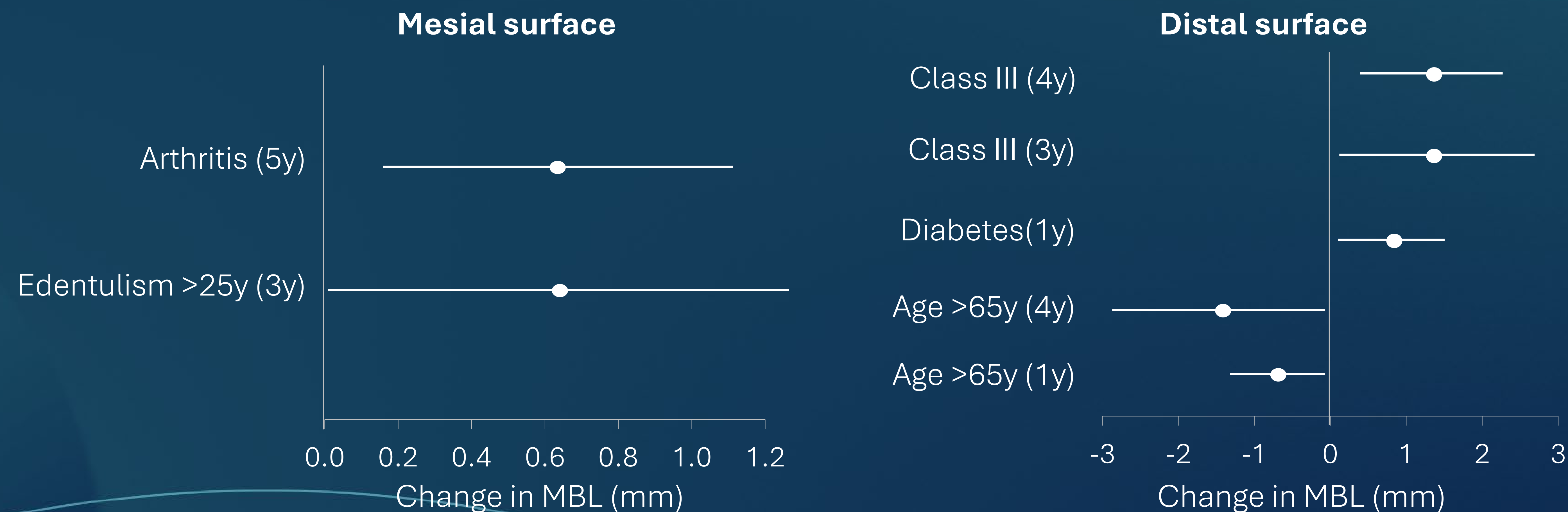


RESULTS

Survival of the Equator attachment over 5 years



Patient-related variables on marginal bone loss



CONCLUSION

- ✓ The results demonstrated **stability of peri-implant health and marginal bone loss** in OM2 users over a 5-year period.
- ⊕ Attachment replacement and an increased number of maintenance events **negatively impacted oral health-related quality of life** (OHRQoL).
- ⊖ **Advanced age, diabetes, and a Class III skeletal profile** were associated with increased distal marginal bone loss, whereas prolonged edentulism and arthritis influenced mesial marginal bone loss.

Clinical Relevance

- ✓ Patient risk profiling may help personalize recall intervals
- ⊕ Long-term follow-up should anticipate increasing maintenance needs after year