



The Rehabilitation of Atrophic Jaws Using Short Implants With Different Surface Characteristics: Multicentric RCT

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Aim

The aim of this research is to evaluate the clinical outcome of short implants equipped with a new design at a macro-structural level and inserted into the upper or lower jaw in situations of reduced available bone volume, also comparing the clinical outcome in relation to two different surface treatments of the implant collar and transmucosal prosthetic components.

Materials and Methods

This multicentric study involves 3 research centers: University of Genoa, University of Foggia and University of Turin. A total of 30 patients is planned to be recruited. Patients who need to insert at least two short implants (length: 6 mm) contiguous in the diatry sectors of the mandible or maxilla have been included. In each patient, two implants (Shard short, Mech&Human) of 6 mm in length and 4.3 mm in diameter have been inserted in adjacent sites with one-stage technique. Both systems presented double acid etched surfaces. Of the two implants, one had a traditional machined collar, the other had an anodized collar. During the surgical phase of implant insertion, the insertion torque obtained and the ISQ value for each implant have been recorded. To monitor peri-implant bone remodeling, intraoral radiographs have been performed at the time of the surgery, at 3 and 6 months and at 1-2 years of healing, then annually. After 3 months of healing, digital impressions will be taken using an intraoral scanner (Shining) to create screw-retained fixed bridges in monolithic zirconia (splinted implants - no single crowns).



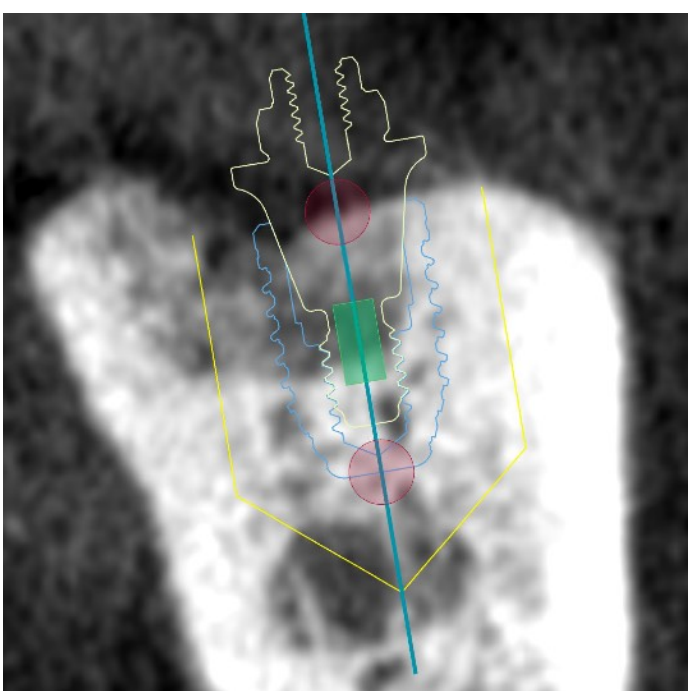
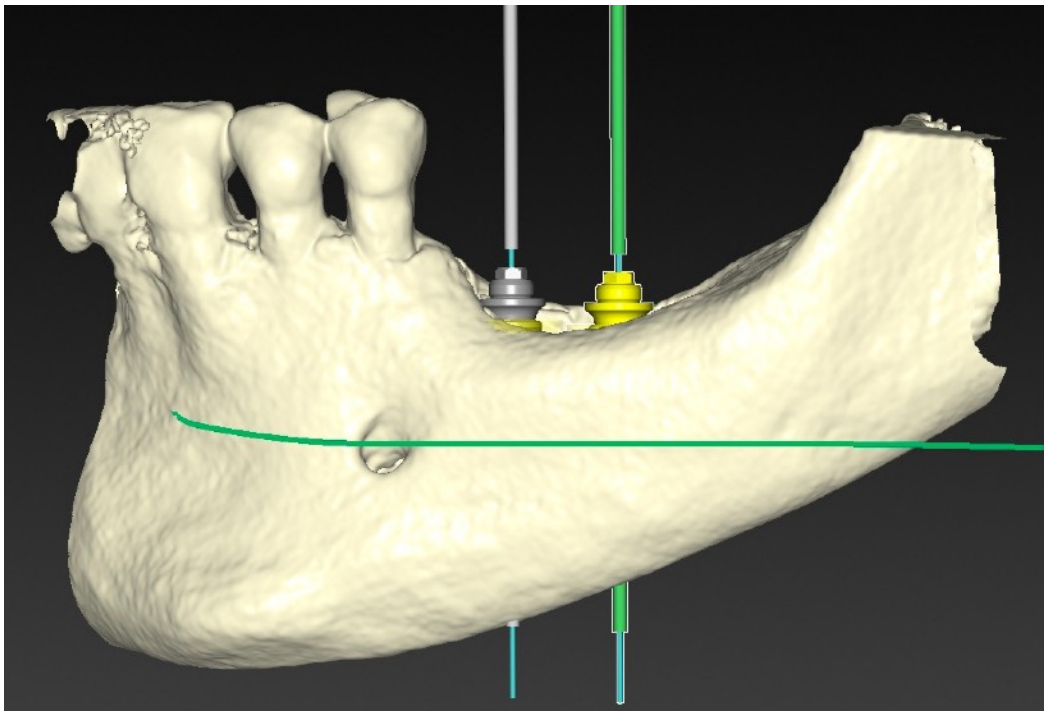
Anodized and machined implant



Anodized and machined MUA



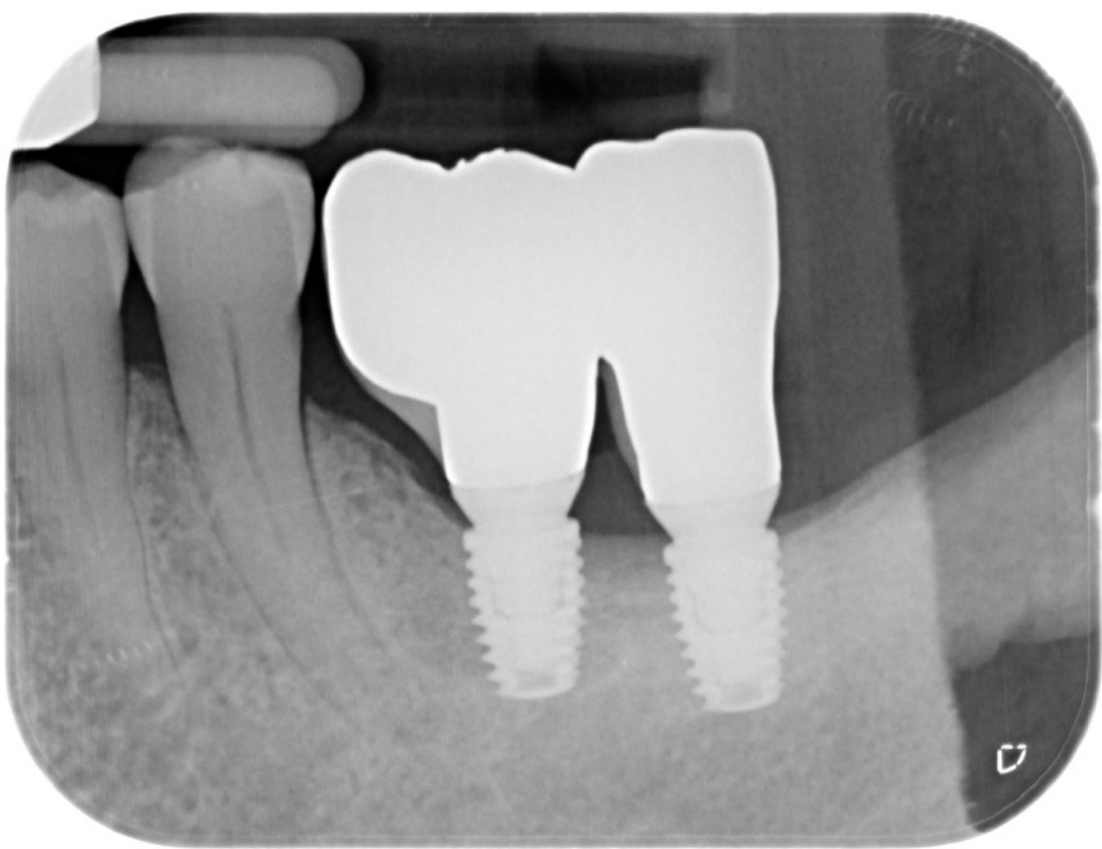
Screwing of the two abutments: above: machined; below: anodized



Digital implant planning



One-year clinical follow-up



Two-years follow-up intramural x-ray

Results

At T3, the mean marginal bone loss was 0.40 ± 0.31 mm in the Test group and 0.42 ± 0.40 mm in the Control group ($p = 0.76$). At T12, these values increased to 0.63 ± 0.41 mm and 0.78 ± 0.43 mm, respectively ($p = 0.94$). Both groups showed physiological probing depths, with mean values ranging from 1.48 mm to 2.10 mm. The Plaque Index (PII) ranged from 0 to 1 in most cases, while Bleeding on Probing (BoP) was observed sporadically as isolated bleeding spots upon probing, with mean values between 0.20 ± 0.41 and 0.50 ± 0.52 . No statistically significant differences were detected between the two groups.

Conclusion

This research will allow us to evaluate the primary and secondary stability of short implants and the adaptation of the peri-implant soft tissues, as an alternative to bone regeneration techniques in marked bone atrophy of the jaws, with the advantage of reducing therapeutic times, comparing the outcomes of implants and transmucosal components with different surface treatments.

Groups	MBL	PPD	PII	BOP
Test	1.25±0.46 mm	2.61±0.66 mm	0.47±0.51	0.41±0.51
Control	1.12±0.51 mm	2.47±0.66 mm	0.31±0.48	0.41±0.51
Intergroup p value	0.37	0.33	0.51	1

Groups	MBL	PPD	PII	BOP
Test	1.75±0.30 mm	2.38±0.66 mm	0.36±0.48	0.45±0.52
Control	1.73±0.28 mm	2.36±0.90 mm	0.47±0.51	0.36±0.50
Intergroup p value	0.83	0.89	0.55	0.39