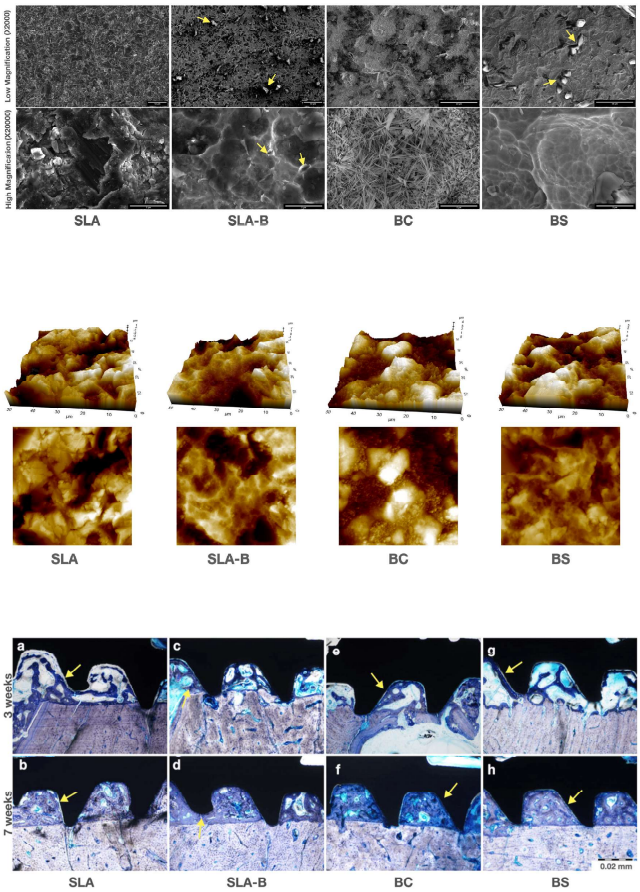
osteogenic activity, ultimately improving implant stability and longevity

Material and Methods: Titanium (Ti) disks ($n=20$) were modified using boron (B) and boric acid (H_3BO_3) and then compared with the conventional implant surface via surface topographic characterizations (XPS, EDS, SEM, AFM, CLSM). Dental implants (3.5 mm in diameter and 8 mm in length) with the experimental surfaces ($n=96$) were inserted into the tibias of six sheep, which were left to heal for 3 and 7 weeks. Histologic, histomorphometric (bone–implant contact (BIC%)) and mechanical tests (removal torque value (RTV)) were performed.

Results: The boron-coated surface BC was smoother (Rz: 4.51 µm ±0.13) than the SLA (5.86 µm ±0.80) and the SLA-B (5.75 µm ±0.64) groups ($p=0.033$). After 3 weeks, the highest mean RTV was found in the SLA group (37 N/cm ±2.87), and the difference compared with the BC group (30 N/cm ±2.60) was statistically significant ($p=0.004$). After 7 weeks, the mean RTV was >80 N/cm in all groups; the highest was measured in the H_3BO_3-treated (BS) group (89 N/cm ±1.53) ($p<0.0001$). No statistically significant differences were found in the BIC%s during both healing periods between the groups.

Conclusion and Clinical implications: Boron and boric acid surface treatment, did not provide a significant advantage over the conventional implants in the early term healing but provided a significant resistance to rotational removal forces in the late term (7 weeks). Boric acid group, seems to be a promising medium for dental implant osseointegration and warrants further investigation to optimize the dose and the method of application onto the blasted Ti surfaces.



I confirm that ethical permits and approvals are in place in accordance with regulations: Yes, I confirm that ethical permits and approvals are in place.

Please provide the ethic votum number (if applicable): 2018/19.

Disclosure of Interest: N. Aysesek Conflict with: %80, Conflict with: %80, Conflict with: %100, B. H. Aysesek: None Declared.

Keywords: Biomaterial, Biomechanical stability, Histomorphometry

IAO-EAO-SIdP-1003/PO-CI-037 | Short term outcome of implant-supported restorations with Hi-Fiber continuous-fiber-reinforced bars: An exploratory study

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Background: Hi-Fiber consists in a technopolymer of continuous pre-tensioned fibers incorporated in 3D printing processes producing a customizable fiber prosthetic structure for each patient. Potentially, it represents an alternative to metal infrastructures in implant-supported fixed restorations in that it guarantees precision, efficiency, and maximum performance, according to recent study. However, scientific validation of this potential alternative is lacking.

Aim/Hypothesis: The aim of this study was to evaluate the outcome of partial and full-arch hybrid implant-supported rehabilitations (All-on-4 concept) integrating Hi-Fiber continuous-fiber-reinforced bars in the short-term outcome (1 year of follow-up).

Material and Methods: This pilot study included 10 consecutive patients ($n=9$ female; $n=1$ male; average age of 57.3 years) for follow-up. Four patients were smokers (40%) and 5 patients (50%) presented systemic conditions (cardiovascular condition: $n=1$; depression: $n=3$; vertigo syndrome: $n=1$; behavioral and mental conditions: $n=1$; more than one condition: $n=1$). A total of 55 implants (maxilla: $n=38$; mandible: $n=17$) supported 2 partial and 11 full-arch prosthesis, produced through a CAD-CAM workflow: Digital planning (Hi-Design software, Hi-Fiber) performed based on 2 lab digital impressions (3Shape d2000) and exported; production of the continuous fiber framework (Hi-Fiber MD01 robot); incorporation into the final acrylic-resin prostheses during the acrylization process. Primary outcome measures were prosthetic and implant cumulative survival evaluated through life tables. Secondary outcome measures were marginal bone loss, mechanical, biological, and esthetic complications.

Results: No patients were lost to follow-up. No prosthetic or implant failures occurred, rendering a prosthetic and implant cumulative survival rate at 1-year of 100%. The average marginal bone loss was 0.43 mm ±1.35 at 1-year of follow-up. Two patients (20%) registered mechanical complications, with abutment screw loosening (resolution included retightening the screws and adjusting the occlusion). Three patients (30%) with 6 implants (10.9%) presented biological complications (infection)

that were resolved through non-surgical treatment. No esthetic complaints were registered.

Conclusion and Clinical implications: Within the limitations of this pilot study, the short-term outcome of partial and full-arch prostheses integrating Hi-Fiber technopolymer reinforced bars is predictable in the short-term. It allowed a reduced time of rehabilitation without compromising the survival outcome during the functional osseointegration period. Nevertheless, more studies with longer follow-up are necessary before validating the clinical efficacy of this treatment modality.

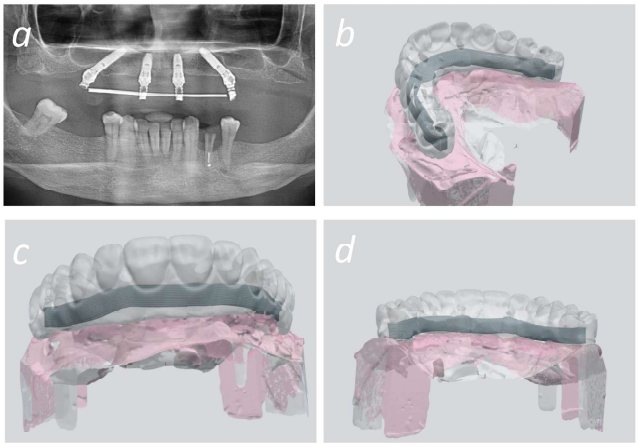

Figure 1 (a) Orthopantomography with maxillary immediate provisional implant-supported prosthesis ad modum All-on-4 Concept; (b) Digital design of the Hi-Fiber technopolymer reinforced bar in palatal-occlusal view; (c) Digital design of the Hi-Fiber technopolymer reinforced bar in vestibular view; (d) Digital design of the Hi-Fiber technopolymer reinforced bar in palatal view.

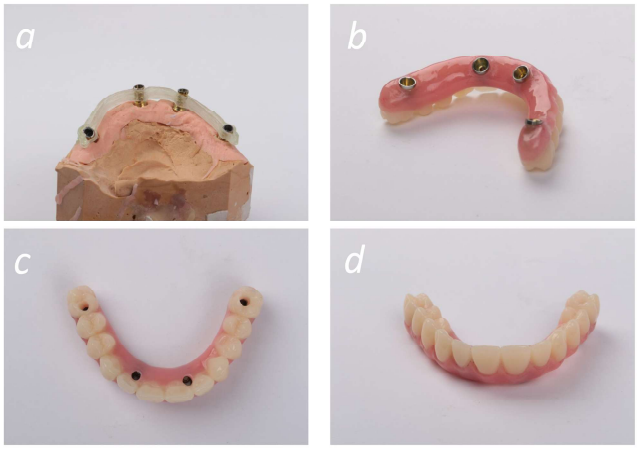

Figure 2 (a) Hi-Fiber technopolymer reinforced bar in palatal-occlusal view; (b) Full-arch implant-supported prosthesis incorporating Hi-Fiber technopolymer reinforced bar – inferior view; (c) Full-arch implant-supported prosthesis incorporating Hi-Fiber technopolymer reinforced bar – occlusal view; (d) Full-arch implant-supported prosthesis incorporating Hi-Fiber technopolymer reinforced bar – vestibular view;

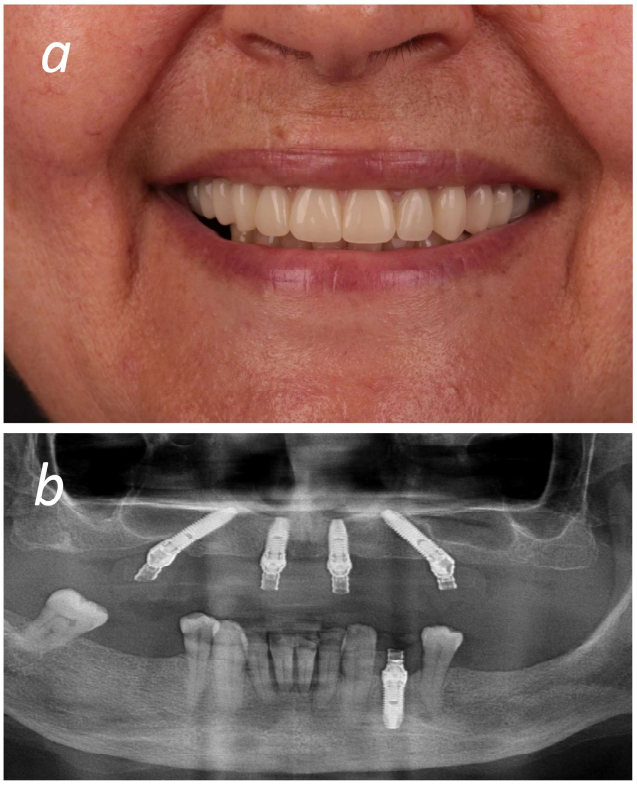

Figure 3 (a) Patient smiling with full-arch implant-supported prosthesis incorporating Hi-Fiber technopolymer reinforced bar; (b) Orthopantomography with Full-arch implant-supported prosthesis incorporating Hi-Fiber technopolymer reinforced bar.

I confirm that ethical permits and approvals are in place in accordance with regulations: Yes, I confirm that ethical permits and approvals are in place.

Please provide the ethic votum number (if applicable): Not applicable. The patients volunteered and signed a written informed conent to participate in this pilot study with a CE mark product.

Disclosure of Interest: None Declared.

Keywords: Biomaterial, Bioprinting, CAD/CAM

IAO-EAO-SIdP-1010/PO-CI-038 | Two years follow type 2B defects with immediate implant and provisional restoration: Case series

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Background: The bone socket morphology after fresh extraction has been determined to be a critical factor when performing immediate implant placement concurrent with provisional restoration. Type 2B is the absence of the middle to coronal two-thirds of the labial bone plate of the extraction socket approximately 7 mm to 9 mm from the free gingival margin.