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**CLINICAL RESEARCH - SURGERY** 

# Five-year analysis of implant survival rates in lateral sinus lifting - randomized clinical trial

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#### **Background and Aim**

Diverse grafts sourced from various origins are employed in lateral sinus lifts, with autologous grafts often haile as the gold standard despite inherent disadvantages. However, in a shift towards minimally invasive procedures and prioritizing patient-reported outcome measures (PROMs), there's a burgeoning interest in alternative biomaterials with established long-term efficacy. Notably, there's a lack of randomized clinical trials documentin the implant survival rate in sinuses regenerated with Osteobiol Mp3® (Tecnoss™) over a follow-up period of fiv years or more.

The objective of this RCT split-mouth clinical trial was to test the hypothesis that there are no differences in implant survival rates between autologous grafts and porcine xenografts with 10% collagen during bilateral lateral sinus lifts. This hypothesis was evaluated through clinical and radiological outcomes over a 5-year follow up period.

### **Methods and Materials**

This randomized split-mouth trial enrolled 12 patients and 24 sinuses. In each patient, one sinus underwent lateral sinus elevation with intraoral autologous graft (A) while the other received porcine xenograft with 10% collagen (X), being the placement side determined by random allocation through opaque sealed envelopes, post-Schneider's membrane elevation. Subsequently, one to three OsseoSpeed TX implants (Astra Tech®) in each side were placed after 6 months (total 39, 19 A and 20 X) and left submerged. These implants were later restored with screwed metallic-ceramic bridges or crowns after another 6 months. Patients underwent a 6month follow-up maintenance program.

Outcome measures included implant survival rate, prosthetic or biological complications, patient preferences, and radiographic marginal bone loss (Mesial and distal).

Statistical analysis assessed the impact of time (baseline and 5 years), graft material (A and X), their interactions and placement side (M–Mesial and D–Distal). The two-way ANOVA analysis was paired over time and independent across materials and conducted for each side.

### SUPPORTING INFORMATION

Biomaterials provided by Tecnoss<sup>™</sup> Srl;

Implants and the various components- Astra Tech's IIS program under the reference D-2012-024; Bolsa SPEMD de Apoio à Divulgação Científica/ SPEMD Scholarship to Support Scientific Dissemination

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### **Results**

ed	The implant survival rate was 100% for A and 95% for X (one implant has not osteointegrated).
S	After 5 years, 10 patients were still enrolled in the trial contributing with 16 implants for A and 15 for
	patients died (heart attack and breast cancer) during the study follow-up. Periimplantitis affected ty
Ig	(2 implants in each group), while one experienced mucositis (1 implant of group X).
'e	The marginal bone loss (for the implants without periimplantitis, 14 A and 13 X) had a significant ti
	(baseline to 5 years) and no significant differences on the performance of A and X materials over t
	results for time effect and material are statistically significant both for mesial and distal (M: time eff
	material p=0.335; D time effect p=0.020, material p=0.713).
V-	The prosthetic complications observed were screw loosening, screw and multi-unit fractures and c
	fractures. The screw and multi-unit fractures were observed in only one patients.



#### Conclusion

After 5 years, a high survival rate of the OsseoSpeed TX implants was observed in both sinus grafted groups. The marginal bone loss reduction showed no significant differences between the groups. However, two patients in both groups experienced periimplantitis.

From a clinical standpoint, porcine xenograft with 10% collagen demonstrates potential as a viable alternative to autologous grafts in lateral sinus lifts.



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