

## **Pullout Forces of Bioabsorbable Polylactide/Glycolide Screws (Biosorb and Lactosorb) and Tacks**

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The aim of this study was to compare the pull-out forces of bioabsorbable polylactide/glycolide (PLGA) tacks and screws in human cadaver parietal bones. Parietal bone pieces (c. 6 cm x 20 cm) were collected from five human male cadavers (age 47 to 75 years). Forty-nine BioSorbPDX® self-reinforced (SR-PLGA 80/20) tacks (diameter 1.5 mm, length 4.0 mm), 47 BioSorbPDX® (SR-PLGA 80/20) screws (diameter 1.5 mm, length 4.0 mm) and 46 LactoSorb® (PLGA 82/18) screws (diameter 1.5 mm, length 4.0 mm) were applied. The tacks were applied to drill holes using a special applicator gun (no tapping or tightening). The screws were applied to drill holes in the traditional way using tapping, and tightening with a screwdriver. A tensile testing machine was used. All the implants were tested thus: the head of the implant was held by an aluminum jig and the jig was pulled with wire until implant failure. The testing pull speed was 10 mm/min. Means and standard deviations (SDs) were calculated and the data analyzed using ANOVA. The pull-out force of the tacks was  $115.9 \pm 8.3$  N, that of Lactosorb® screws was  $112.9 \pm 12.1$  N and that of Biosorb® screws was  $110.4 \pm 8.9$  N (statistically insignificant difference between the three groups). The most common reason for failure in the case of tacks was barb breakage (55.1%); it was thread breakage in the case of BioSorb® screws (66%) and stem split in the case of Lactosorb® screws (56%). Tacks seem to have a similar, perhaps even a little better holding power to cranial bone as screws and can hence be recommended for clinical application, as the procedure saves time and, consequently, costs.

**Keywords:** Applicator gun, Bioabsorbable, Screw, SR-PLGA, Tack