Materials and methods

Cylindrical specimens of titanium, PLGA and PLGA+AB in triplicate were examined for S. epidermidis ATCC 35989 attachment and biofilm formation after incubation with a bacterial suspension of ca. 105 cfu/ml for 1, 3, 7, 14 and 21 days, using scanning electron microscopy. Growth inhibition properties of PLGA and PLGA + AB cylinders were tested on agar plates.

Results

On days 1, 3 and 21, no bacterial attachment was seen in 19.5%, 9.2% and 41.4% of the titanium specimens, in 18.4%, 28.7% and 34.5% of the PLGA specimens and in 57.5%, 62.1% and 57.5% of the PLGA + AB specimens, respectively. During the whole study period no biofilm was observed on 74%-93% of the titanium specimens, 58%-78% of the PLGA specimens and 93%-100% of the PLGA+AB specimens. PLGA + AB showed clear bacterial growth inhibition on agar plates while PLGA and titanium did not show any inhibition.

Conclusions

PLGA + AB bioabsorbable material was superior to titanium in preventing bacterial attachment and biofilm formation and may have clinical applicability, for example, in prevention of infection in trauma surgery or in the treatment of chronic osteomyelitis.

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REPORT ON A NEW TECHNIQUE FOR CORRECTION OF TRIGONOCEPHALY USING BIOABSORBABLE OSTEOFIXATION TACKS AND PLATES AND A NOVEL TACK-SHOOTER

Willy Serlo*, Nureddin Ashammakhi, Satu Länsman***, Pertti Törmälä**, Timo Waris******

*Department of Pediatrics, Oulu University Hospital, Oulu, Finland.
**Institute of Biomaterials, Tampere University of Technology, Tampere, Finland.
***Department of Ophthalmology, Oulu University Hospital, Oulu, Finland.
****Department of Surgery, Oulu University Hospital, Oulu, Finland.

Abstract

We report on the feasibility of applying bioabsorbable tacks using a new tack-shooter to fix bioabsorbable plates applied endocranially for the correction of three cases of trigonocephaly. Tacks do not require tapping or tightening because they are applied using a tack-shooter directly into drill holes in the bone. Hence, the technique saves valuable operative time. A 1.5- to 2.0-cm broad supraorbital bar (bandeau) was raised and reshaped. The corrected shape was maintained using a Biosorb plate (Bionx Implants Ltd, Tampere, Finland), and tacks were applied on the endocranial side of the bar. The plate extended a few centimeters laterally beyond the edge of the supraorbital bar, and it was fixed with Biosorb miniscrews and/or tacks affixed to the temporal bones. Other molded bone pieces were fixed using Biosorb plates, screws, and/or tacks. The technique of using tacks was easy, and it provided secure osteofixation. Cosmetic results were excellent, and no complications were encountered except for palpability of plate edges on the right side of the skull in one case.
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