

Bioabsorbable poly-L/D-lactide vs. silicone sponge scleral buckling implants can induce sufficiently persistent indentation in rabbits

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INTRODUCTION: In the treatment of rhegmatogenous retinal detachment, scleral buckling operation has been used for decades. The scleral buckling implant creates an inward impression for attaching the layers of retina and choroid to each other. In simple rhegmatogenous detachments, after the chorioretinal scar has developed and matured, the supporting buckling implant would no longer be required¹. Various materials for scleral buckling have been used. Non-absorbable materials are commonly used, such as silicone, either solid rubber or silicone sponge. Now also bioabsorbable synthetic materials are available for scleral buckling in cases when only temporary buckling effect is needed. Because polylactides have been extensively studied in surgery, we chose to fabricate a scleral buckling implant made of poly-L/D-lactide 96/4 (PLA96) as raw material². The aim of this study was to measure the amount and duration of indentation depth achieved with biodegradable poly-L/D-lactide 96/4 and silicone sponge implants.

METHODS: Thirty rabbits underwent a scleral buckling procedure. A PLA96 buckling implant was used in 15 and a silicone sponge buckling implant in 15 rabbits. A circumferential scleral buckling implant was sutured episclerally on the left eye of each rabbit, just temporal to the superior rectus muscle and 7 mm posterior to the limbus. CT scanning was performed at one week, and three and five months postoperatively.

RESULTS: The PLA96 buckling implant (implant diameter 3–3.5 mm) used in this study created lower indentation than the silicone sponge implant (implant diameter 4 mm). The indentation created by the PLA96 implant decreased over time compared with the silicone implant. There were no macroscopically detectable complications related to either kind of implant.

DISCUSSION: The indentation achieved with bioabsorbable implant was lower than indentation

with silicone sponge implants, probably due to difference in the original sizes of the implants. Both silicone sponge implants and PLA96 implants caused indentation that decreased in a comparable manner over the follow-up period of 5 months.

With non-absorbable implants there is always a risk for long-term complications, such as infection, extrusion, intrusion, pain or persistent diplopia³. By using bioabsorbable implants, the long-term complications can be avoided.

The recommended time period for determining the functional success of operation, measured as the best corrected visual acuity, is six months⁴. At that time period, in most of the cases of simple rhegmatogenous detachments, the retina has reattached and chorioretinal scar is strong enough to keep it attached. In the current study it was proved that with PLA96 implants the indentation lasted for the follow-up period of 5 months.

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