

A biological tissue adhesive and dissolvent system for intraocular tumor plaque radiotherapy: an in vivo animal model experiment.

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Abstract:

Purpose: To examine a novel biological adhesive and dissolvent system for plaque placement and removal using fibrin glue and urokinase, respectively, in an in vivo animal model. **Methods:** The study was performed on 23 rabbit eyes. Of these, eight underwent a technical feasibility study and ultrasonographic plaque displacement measurements, nine were examined clinically and by magnetic resonance imaging and histopathology for tissue reaction to the biological substances used, and in six the impact of fibrin glue as an orbital space occupier on intraocular pressure was assessed. In an additional ex vivo experiment, the glue's radiation attenuating properties were tested using an oncology EDR2 film. **Results:** Plaque horizontal movement throughout follow-up (7-10 days) was negligible (0.5 ± 0.2 mm), and there was no tilting whatsoever. In the tissue response experiment, no adverse effects were recorded after application of fibrin or urokinase throughout the 21-day follow-up period. Interestingly, a circumscribed local inflammatory response was noted in tissue surrounding the fibrin glue, and persisted at 21 days. In the orbital space-occupying experiment, application of 1 cc fibrin glue did not cause a significant elevation in intraocular pressure (IOP) ($P = 0.06$), and in the ex vivo experiment, there was no significant difference between radiation readings with and without glue separation of the radioactive sources and film ($P = 0.065$). **Conclusions:** The adhesive and dissolvent system was feasible and safe for plaque placement and removal. It may be superior to conventional surgical plaque placement methods in eliminating the relatively common risk of plaque tilting and complications due to scleral

suturing.

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