Reversible portal vein embolization in a rabbit model using fibrin glue and aprotinin.

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Abstract:

Background: Portal vein embolization (PVE) is used to increase future remnant liver volume in patients requiring major hepatic resections. The aim of this study was to modulate lysis time of a fibrin-glue (FG) based embolization material by addition of the fibrinolysis inhibiting agent aprotinin to establish reversible PVE. Material and Methods: PVE of the cranial liver lobes was performed in 30 rabbits, divided into 6 groups using FG with 150 to 1000 KIU aprotinin. Caudal liver lobe hypertrophy was determined by CT-volumetry and recanalization of the embolized segments was asessed by portal reperfusion on CT images. The rabbits were sacrificed after 7 or 49 days and results were compared to a previous series using permanent embolization materials. Results: A dose dependant effect of aprotinin on caudal lobe hypertrophy was found, with 500 KIU providing the highest regeneration rate over the first 3 days (P<0. 05 compared to 300, 150 and permanent embolization groups). Lower concentrations of aprotinin (150, 300 KIU) resulted in fast recanalization of the embolized segments. Despite adequate embolization, higher concentrations of aprotinin (700, 1000 KIU) also displayed a lower hypertrophy response. When using 500 KIU aprotinin, 4 of 5 animals had adequate recanalization after 49 days. Conclusion: PVE using FG with a concentration of 500KIU aprotinin resulted in adequate hypertrophy with 80% recanalization after 49 days. At higher concentrations, an inhibitory effect of aprotinin on the hypertrophy response was found.