

Wound healing and degradation of the fibrin sealant Beriplast P following partial liver resection in rabbits.

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Abstract:

The objective of this study was to investigate the degradation kinetics of the fibrin sealant (FS) Beriplast P in an experimental liver surgery model in rabbits. A partial liver resection was performed in 21 rabbits, and the wound area covered with Beriplast P to ensure hemostasis. Wound healing of the resection sites was evaluated morphologically over 11 weeks. Degradation of the FS was evaluated by measuring the thickness of the remaining fibrin layer. Plasma samples were analyzed for antibodies against fibrinogen, albumin, thrombin, fibrin, and factor XIII. No postoperative hemorrhage was observed, indicating successful hemostasis throughout. The FS was degraded with a half-life of about 25 days postapplication and was completely replaced by granulation tissue within 9 weeks. The FS degradation and tissue development followed the general stages of wound healing: inflammation and resorption, proliferation, organization and production of collagen, maturation, and scarring. An immune reaction was elicited against the main four human proteins of the FS. The antibody titers peaked on day 14, with a gradual decrease thereafter. We conclude that the FS accomplished hemostasis, facilitated healing in accordance with natural processes, and was completely degraded over time. In humans, the reduced immunogenicity of the FS would potentially increase its degradation half-life. Copyright © 2005 by the Wound Healing Society.