Pathologic evaluation of hemostatic agents in percutaneous nephrolithotomy tracts in a porcine model.

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Abstract:

Background and Purpose: Hemostatic agents have been suggested as an adjunct for tubeless percutaneous nephrolithotomy (PCNL). We pathologically evaluated the percutaneous tracts injected with the fibrin sealant (FS) Evicel and hemostatic gelatin matrix (HGM) Surgiflo at various time intervals to determine their absorption and tract closure rates. We also evaluated whether these agents reduced urine leak rates in a porcine model. Materials and Methods: Percutaneous access was obtained in 19 kidneys in 10 domestic swine. The tracts were dilated to 30F using a balloon dilating catheter. Ten kidneys served as controls. Surgiflo was injected into the tract of four kidneys, and Evicel was injected into the tract of five kidneys. Intravenous urography (IVU) was performed on postoperative days (POD) 1 and 10 to 14. IVU was performed on two pigs at POD 30. The pigs were sacrificed and kidneys were harvested for pathologic evaluation. Results: Two (20%) control kidneys had a urine leak on IVU on POD 1. None of the kidneys treated with HGM or FS had a urine leak on POD 1. None of the kidneys had a leak on POD 10 to 14 or POD 30. On pathologic inspection, the tracts of all the control kidneys and HGM kidneys had closed completely at POD 14. Two kidneys treated with FS had fistula at POD 6 and POD 14. At POD 30, the tracts in the control kidneys and kidney treated with HGM had completely healed. Fibrin sealant remained in the tract at POD 30. Conclusion: Fibrin sealant should be used with caution because it can persist in the tract for up to 30 days and may inhibit wound healing. Hemostatic gelatin matrix is the preferable agent because the tract closed by POD 10 to 14, similar to the findings in the control animals. The use of hemostatic

agents in a nephroscopy tract may reduce the risk of early urine leak after tubeless PCNL. © 2011, Mary Ann Liebert, Inc.