Sprayed fibrin sealant as the sole hemostatic agent for porcine laparoscopic partial nephrectomy.

Authors: Pick DL, Kolla SB, Mucksavage P, Louie MK, Sountoulides P, Kaufmann O, Olamendi S, Kaplan A, Huynh V, Ortiz-Vanderdys C, Truong HP, Said SA, Andrade L, Tongson-Ignacio J, McDougall EM, Clayman RV

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Abstract:

PURPOSE: Tisseel is used to control minor bleeding during laparoscopic procedures. The DuploSpray MISTM spray system allows thin, even application over a larger surface area. We use sprayed Tisseel as the sole agent to control hemorrhage and seal the renal collecting system after severe porcine laparoscopic partial nephrectomy.

METHODS AND MATERIALS: We performed staged bilateral severe laparoscopic partial nephrectomy in 12 Yucatan pigs using a longitudinal cut from upper to lower pole through the entire collecting system. In each pig 1 kidney was harvested immediately while the other was harvested after 4 weeks. After hilar clamping laparoscopic partial nephrectomy was done with cold scissors in 6 pigs while LigaSureTM was used in the other 6. Sprayed Tisseel was applied, and bleeding and urinary leakage were evaluated. Additional Tisseel was applied for repeat bleeding. We performed retrograde pyelogram (chronic) and burst pressure testing of the arterial and collecting systems.

RESULTS: All animals survived 4 weeks. One urinoma was seen on retrograde pyelogram in the cold cut group. Average hilar clamp time was similar in the acute and chronic study arms. Average estimated blood loss was significantly less in the LigaSure group ($p = 0.0045$). Average arterial burst pressure was significantly different in the chronic and acute groups (605.8 vs 350.4 mm Hg, p =

0.008) but average collecting system burst pressure was similar (186.3 and 149.5 mm Hg, respectively).

CONCLUSIONS: Sprayed Tisseel without suturing effectively sealed the arterial and collecting system after severe laparoscopic partial nephrectomy in the porcine model.