Laparoscopic heminephrectomy using a new fibrin sealant powder.

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Abstract:

Objectives. To determine the ability of a hemostatic fibrin sealant powder (HFSP), delivered laparoscopically, to achieve hemostasis and seal the collecting system during laparoscopic heminephrectomy. Methods. An HFSP preparation was applied laparoscopically as a dry powder spray. Twenty-two farm pigs were randomized into two laparoscopic heminephrectomy groups: group 1 underwent conventional intracorporal suturing with vascular control (n = 11) and group 2 received HFSP application alone with regional ischemia (n = 11). Computed tomography was performed at 48 hours and again 6 weeks postoperatively. Results. The operative findings revealed no differences between the two groups in the weight of the removed segments, mean arterial blood pressure, operating room time, estimated blood loss, or hematocrit and serum creatinine levels. The gross examination 6 weeks postoperatively found no delayed bleeding, urinoma formation, or bowel adhesions. The computed tomography findings at 48 hours postoperatively demonstrated excellent hemostasis in both groups. Urinary extravasation was detected in 8 (80%) of 10 animals in the HFSP group and 1 (9%) of 11 in the conventional group at 48 hours ($P < 0.008$). At the 6-week computed tomography evaluation, none of the animals showed evidence of urinoma or hematoma formation. Histopathologically, at 6 weeks, the cut surface of the kidneys in both groups had been replaced by dense scar tissue at the cortex with a sharp line of demarcation between the scar and normal kidney. Conclusions. HFSP greatly facilitates laparoscopic heminephrectomy by providing rapid and lasting hemostasis without suturing. Early urine extravasation was more common in the HFSP group, but no clinical, gross, or radiographic evidence of urinoma formation was seen in either

group 6 weeks after surgery.