Laparoscopic injection of fibrin glue to arrest intraparenchymal abdominal hemorrhage: An experimental study.

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Abstract:

The laparoscope offers a novel avenue for the diagnosis of intra-abdominal injury and the use of fibrin glue (FG) as a treatment for hemorrhage in trauma patients. This study was undertaken to assess the practicality and effectiveness of FG injection under laparoscopic direction to arrest hemorrhage in solid viscera. Twenty dogs were randomized into a control group (CG) and a treatment group (TG). All animals underwent laparotomy to surgically induce uniform injuries to the hepatic and splenic parenchyma. The TG animals (n = 12) were allowed to hemorrhage for 30 minutes. The injuries were then visualized and FG injected intraparenchymally under laparoscopic direction. The average duration of the procedure was 25 minutes (range, 15- 50). No hemostatic interventions were performed on the CG animals (n = 8). Mortality in the CG was 63% (5 of 8); there were no deaths in TG animals prior to sacrifice. Necropsy of TG animals revealed progressively healing hepatic and splenic injuries with no gross evidence of pulmonary FG emboli, intraparenchymal microemboli, or increased adhesion formation. No other complications were noted. This study demonstrates that hemorrhage from the liver and spleen can be successfully controlled using the laparoscope to direct the intraparenchymal injection of FG. In this experimental model, the procedure can be performed expeditiously. It is associated with reduction of mortality to zero when compared with controls. No complications associated with laparoscopy or FG injection were recognized. This technique may have potential for application in the management of stable patients who manifest evidence of intraperitoneal hemorrhage as a result of solid organ injury.