Laboratory indicators of the efficiency of fibrin glue in laparoscopic surgery.

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Abstract:

BACKGROUND: Fibrin glue (FG) is a blood-derived tissue adhesive that mimics the natural coagulation process. It consists of two basic components - fibrinogen and thrombin, where activation of fibrinogen and its transformation into fibrin under the action of thrombin is the third phase of blood coagulation. FG is used to promote wound healing, skin grafting, to provide hemostasis in microvascular surgery and parenchymal injury and to serve as a matrix for repair of bone defects. The aim of this study was to analyze laboratory indicators of the metabolic response to surgical trauma, when applying different means of hemostasis during laparoscopic cholecystectomy. METHODS: The study included a total of 40 experimental pigs in which was performed laparoscopic cholecystectomy and intraoperative artificially damage of gallbladder boxes, which was repaired using FG in animals of experimental group (EG) or using standard means in animals of the control group (CG). FG was homemade, prepared from two components, of which the first was prepared from the cryoprecipitate with the addition of antifibrinolytic agents (aprotinin). The second component was a commercial bovine thrombin with calcium chloride. During 30 days of follow-up we have taken blood samples for following biochemical tests: general laboratory tests (glucose, bilirubin, cholesterol, triglycerides), enzyme markers of hepato-biliary damage (AST, ALT, AP, GGT), parameters of synthetic liver function (total protein and albumin), electrolytes (Na, K). RESULTS: There is a statistically significant higher levels of AST and ALT in CG ($p<0,05$), while the level of GGT and AP is less in EG from the fifth to thirtieth day, but without statistical significance. The elevated values of AST and ALT in EG faster return to normal (day 5th in EG vs day 14th in

CG). Postoperative concentration of Na+ does not show a statistical difference between groups, while the concentration of K+ in CG is high statistical decreased until the 14th day (3,725+/-0,386 in CG vs 5,025+/-1,237 in EG, p<0,0001). CONCLUSIONS: Application of FG provides less parenchyma destruction and faster liver recovery and thus can be used as efficient hemostatic agent in laparoscopic surgery.