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Bacterial Translocation after Partial Hepatic Resection under Ischemia and Reperfusion in Rats: Incidence and Time Course

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**Abstract:** Infectious complications are major causes of morbidity and mortality following major hepatic resection. We investigated in rats the incidence and time course of bacterial translocation after partial hepatectomy during ischemia and reperfusion. Forty-eight male Wistar rats weighing 230 to 280 g were studied. Partial liver warm ischemia was performed for 15 min followed by reperfusion for 15 min. During a second 15 min of ischemia, 70% hepatectomy was performed. The animals were divided into six groups of eight animals each. Animals were sacrificed 8, 16, 24, 48, 72, and 120 h after the hepatectomy. At each time point blood was drawn for culture, tumor necrosis factor-alpha (TNF- $\alpha$ ) and endotoxin determination. Specimens from the mesenteric lymph nodes (MLNs), spleen and liver were harvested for Gram-positive, Gram-negative, and anaerobic bacteria cultures. Plasma endotoxin levels increased significantly in all animals, peaking at 24 h after resection. TNF- $\alpha$  levels increased immediately after surgery, reaching a peak level at 48 h. The incidence of bacterial translocation and the number of translocated bacteria reached their highest levels 48 h after resection. The rate of translocation to both portal and arterial blood was 88% at 48 h and 63% at 24 h. Translocation to intraabdominal organs (liver, spleen and MLNs) was 88% at 48 h and 75% at 72 h. Proteus species was cultured most frequently (29%), followed by Escherichia coli (23%). In conclusion, bacterial translocation in rats with 70% hepatectomy under ischemia/reperfusion was significantly increased 48 h after surgery. This outcome correlates with serum TNF- $\alpha$  levels.

**Key Words:** liver ischemia, major hepatectomy, bacterial translocation, endotoxin, TNF- $\alpha$

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