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Gas Jet Transection of Liver Parenchima. Experimental research

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Abstract

Background: There is a great variety of liver parenchyma transection techniques. The objective of this research lies in developing a new method of liver transection and comparing it to the existing ones.

Methods: The original gas jet transection method of biological tissues and the apparatus for its realization «Pneumojet» were developed in our institute. Efficiency comparison of gas jet, water jet, ultrasonic methods of liver transection and clamp crushing technique were carried out on 24 mini-pigs. We did not use Pringle manoeuver.

Results: The mean blood loss was the smallest in the group of animals that had a gas jet transection (3.5±0.15 ml/cm²) and the highest in the clamp crushing technique group (5.5±0.46 ml/cm²). Indicators present statistically authentic differences ($p<0.001$). The transection speed was the highest in the Clamp crushing technique group (2.9±0.25 cm²/min) and was credibly higher than in the gas jet (2.4±0.16 cm²/min), ultrasonic (2.4±0.13 cm²/min) and water jet (2.5±0.14 cm²/min) transection groups. Compared to the water jet and ultrasonic methods of liver transection the original method does not have statistically reliable distinctions on the basic indexes of work.

Conclusions: The research conducted proves high efficiency and safety of the gas jet transection method. Gas jet transection, therefore, can be recommended for further improvement and clinical application.

Key words: gas jet transection, water jet transection, ultrasonic transection, clamp crushing, liver resection

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