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Method of approximated intestinal anastomosis in experimental model

Background: Operation in low birth weight infant presents an extraordinary challenge. The surgical tactics should be devised so that it carries a minimal risk of reoperation, a minimal surgical stress and ensures maximum intestine sparing.

Aim: A technique of approximated anastomosis in which integrity and continuity of bowel is achieved with limited number of interrupted seromuscular stitches was evaluated in experimental study.

Material and methods: Small bowel anastomosis were performed in twenty two rats (Wistar, male) with weight range 194-256g. An approximated anastomosis in the ileum of twelve rats was performed with five seromuscular-interrupted sutures only; in the second study group anastomosis was performed with conventional technique of interrupted sutures. The rats equally from each group were killed and analyzed on day 1 and on day 7 after surgery. The approximated anastomosis was evaluated concerning operating time, anastomotic healing, anastomotic strength, and changes in gelatinase activity in comparison to the conventional anastomosis. Test of bursting pressure was performed to measure the anastomotic strength. Tissue samples containing the suture line and control samples from nonoperated sites were analyzed by quantitative gelatin zymography. Statistics was calculated with ANOVA test.

Results: All anastomosis in both group healed well without obstruction. The median operating time needed for approximated anastomosis was shorter ($16 \pm 7,1$ min versus $23,6 \pm 6,2$ min, $p=0,016$). The strength of approximated anastomosis after 1 day was 55 ± 15 torr; strength of standard anastomosis was 55 ± 42 torr ($p=1$). The strength of approximated anastomosis after 7 days was 249 ± 39 torr; strength of standard anastomosis was 218 ± 23 torr ($p = 0,118$). Changes in gelatinase activity of MMP2 and MMP9 enzymes and their proform did not differ significantly between both types of anastomosis. Activity of MMP2 and proform of MMP9 in anastomotic area in both types of anastomosis significantly increase in comparison with activity in samples of nonoperated bowel ($p=0,01$ resp $0,03$). There were no significant differences in the others evaluated parameters between two study groups.

Conclusion: In the animal model presented, the approximated anastomosis shows time saving alternative to standard anastomosis, with the same parameters of anastomotic healing, anastomotic strength, changes in gelatinase activity, and adhesions.

8. Literatura

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