Global Conference on Multidisciplinary Research and Innovation
Hosted Online from Berlin, Germany
Date: 2nd June, 2026
Website: https://econferencia.com

EXPERIMENTAL AND MORPHOLOGICAL JUSTIFICATION OF A "HEMOBEN" AND METHYLENE BLUE ANTIADHESION BARRIER FOR THE PREVENTION OF PERITONEAL ADHESIONS

Mardanov Vohid Narzullaevich
Samarkand State Medical University

Relevance

Postoperative peritoneal adhesions develop after almost any abdominal operation and are the leading cause of recurrent adhesive intestinal obstruction. Widely used antiadhesion barriers have been associated with a number of adverse effects, including immunosuppression, allergic reactions and an increased incidence of intra-abdominal infectious complications. An ideal agent should not interrupt the natural protective adhesion process but should accelerate adhesion resorption, which justifies the experimental search for new biocompatible materials.

Material and methods

Experimental studies were carried out on 48 sexually mature female rats (control group n=23, experimental group n=25) euthanized at 3, 5, 7, 14 and 21 days. An original model of adhesion formation involving bowel loops and the parietal peritoneum was developed by scarification of the visceral and parietal peritoneum. In the experimental group, "Hemoben" hemostatic powder (Na-carboxymethylcellulose, viscose and bound calcium ions) was applied to the injured peritoneal surfaces until a thin film formed, with methylene blue added at 5 mg per 1 g of powder, and a 2% gel was instilled into the abdominal cavity at the end of the operation. The number and strength of adhesions and the morphological changes were assessed.

Results and discussion

By day 21, the number of adhesions was significantly lower in the experimental group than in controls (1.3±0.9 vs 5.4±2.2), as was adhesion strength (1.75±0.07 vs 3.48±0.12 kPa). In the control group, dense visceroparietal and interintestinal adhesions formed, accompanied by focal macrophage-lymphocytic infiltration, thickening and edema of the vascular walls, and connective-tissue adhesions in the resection zone. In the experimental group, only thin elastic films that did not impair intestinal motility were observed; morphologically, the resection zone contained fine fibrillar connective tissue with fully formed, blood-filled vessels and a markedly lower intensity of local inflammation, edema and fibroblastic activity, reflecting accelerated mesothelial regeneration.

Conclusion

The “Hemoben” and methylene blue antiadhesion barrier is safe and effective in preventing peritoneal adhesion formation in the experimental model, reducing both the number and strength of adhesions and the intensity of the local inflammatory and fibroblastic response. These results provide a morphological basis for introducing the method into clinical practice after laparoscopic adhesiolysis.