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The peritoneum is alive during surgery : from pathophysiology to the operative theater

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Topic : Adhesion Prevention

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Novel Carboxymethylcellulose-Derived Hydrogel Prevents Postoperative Adhesions in a Rat Intraperitoneal Adhesion Model

Novel carboxymethylcellulose(CMC)-derived hydrogel in which phosphatidylethanolamine(PE) was introduced into the carboxyl groups of sodium CMC was newly developed. The purpose of the present study is to evaluate the efficacy of the CMC-PE in the prevention of postoperative adhesion in a rat model.

SD rats which received defects to their peritoneal wall and cecum were divided into four groups. In the preventive groups, CMC-PE, a mixture of CMC and PE or Seprafilm were applied. The control group received no treatment. Four weeks after, adhesions were scored and their strengths were measured.

The control group showed significant adhesions. CMC-PE-treated group showed a significant decrease of the adhesion score and strength. Moreover, they were lower than those of the Seprafilm-treated group. On the other hand, a mixture of CMC and PE-treated group showed significant adhesions.

The novel CMC-PE hydrogel was highly effective in reducing postoperative adhesions in this rat model, and the covalent binding of PE to CMC was important for this effect. This hydrogel may be appropriate for human clinical trials in open and laparoscopic surgical procedures.