

Preventive Effect of Starch-Derived Absorbable Polysaccharide Hemostat on Postoperative Intestinal Adhesion Formation

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BACKGROUND: Starch-derived absorbable polysaccharide hemostats (SAPH) are new materials, discovered in the USA, and now frequently used in surgery because of superior hemostasis and complete degradation.

OBJECTIVE: The purpose of this study was to observe the effect of SAPH on preventing postoperative intestinal adhesion formation.

DESIGN, TIME AND SETTING: A comparative study was performed at Department of Pathophysiology, the Fourth Military Medical University of Chinese PLA between June 2007 and June 2008.

MATERIALS: Two types of SAPH were used in this study, including a polysaccharide hemostatic system (PerClot™) provided by Starch Medical Inc., USA and an absorbable polysaccharide hemisphere (Arista™ AH) provided by Medafor Inc., USA. Sodium hyaluronate was provided by Shanghai Jianhua Fine Biological Products Co., Ltd.

METHODS: A total of 48 male Sprague-Dawley rats were equally and randomly divided into four groups, PerClot (1g) group, Arista AH (1g) group, sodium hyaluronate (1g) group, and control group (without any product). A cecal abrasion model was used to assess adhesion formation in each of the four groups. The animals were sacrificed two weeks after treatments.

MAIN OUTCOME MEASURES: Infections of the abdominal cavities were generally observed and product residual was compared in the four groups. Adhesion severity was semi-quantitated. Cecal tissue was resected for histopathological examination.

RESULTS: No infections were noted in any of the groups. Adhesion severity in the PerClot group, Arista AH group and sodium hyaluronate group was significantly lower than that of the control group ($p < 0.05$), but there were no significant differences noted among the former three groups. No residual product was noted in the the PerClot group or the Arista AH group. A large peritoneal effusion was observed in the sodium hyaluronate group. Histopathological examination indicated that there was a marked inflammatory cell infiltrate and serosal fibroblastic proliferation in the control group. The histopathological changes in the PerClot, Arista AH and sodium hyaluronate groups were less severe than those noted in the control group.

CONCLUSION: PerClot, Arista AH and sodium hyaluronate can prevent postoperative intestinal adhesion formation.

Adapted from *Journal of Clinical Rehabilitative Tissue Engineering Research* 2009;13(12):2287-90