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Platelet-rich Plasma Gel versus Hyaluronic Acid on Prevention of Peritoneal Abdominal Adhesion Formation in Rats

Konstantinos Stratakis[1,2]*,Theofanis Arkoumanis[1], Aliki Liakea[3], Nikolaos Nikiteas[1], David Zargaran[4], Alexander Zargaran[5], Konstantinos Kontzoglou[1], Pelagia Kyriakopoulou[1], Despoina Perrea[1]
[1]"N.S. Christeas" Laboratory of Experimental Surgery and Surgical Research, Medical School, National and Kapodistrian University, Athens, Greece
[2]Service of General Surgery, Valais Hospitals, Sion, Switzerland
[3]First Department of Pathology, Medical School, National and Kapodistrian University, Athens, Greece
[4]Royal Free Hospital, London, NW3 2QG, United Kingdom
[5]Chelsea and Westminster Hospital, London, SW10 9NH, United Kingdom

Abstract
Background: Intra-abdominal adhesion formation is still unavoidable and a cause of significant morbidity in abdominal surgery. Platelet-rich plasma gel and hyaluronic acid have been studied for their protective of therapeutic effects on adhesions. The aim of the present study is to compare Platelet-rich plasma and hyaluronic acid in adhesion prevention.
Material and method: Twenty-seven Sprague-Dawley rats were randomly allocated into three equal groups(n=9). Surgical trauma was used to induce adhesion formation. After trauma, 1 ml normal saline was instilled in the peritoneal cavity in control group (n=9), 1 ml liquid Hyaluronic acid (25 mg/ml) was instilled in group A (n= 9) and 1 ml of platelet-rich plasma was instilled in group B (n = 9). Four weeks after the laparotomy, a repetitive laparotomy was performed and adhesions were examined microscopically and macroscopically.
Results: Platelet-rich plasma gel and hyaluronic acid both reduce the extent and grade of adhesions macroscopically. Interestingly, PRP turns out to be superior in the reduction of tenacity and adhesion area. Moreover, platelet-rich plasma ameliorates abdominal adhesion formation by reducing neutrophils, fibrosis, and inflammation.
Conclusion: The results indicate that platelet-rich plasma gel surpasses hyaluronic acid in abdominal adhesion prevention.
Key words: hyaluronic acid (HA), platelet-rich plasma (PRP), rat intestinal model, abdominal adhesions, experimental surgery