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The Use of Illustration in a Surgical Study: The Process of Colon Anastomosis and Hyperthermic Intraperitoneal Chemotherapy- An Original Research Sampling

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This scientific study was aimed to investigate the combined use of the Plasma Rich Platelet (PRP) with Cytoreductive Surgery (CRS) and Hyperthermic Intraperitoneal Chemotherapy (HIPEC) on bowel anastomosis healing and its effect on overall survival rates in rats. The efficacy of CRS and HIPEC in humans has been reported in many studies in the medical literature. Extensive surgery is usually required to achieve complete cytoreduction, especially in the colon and rectal cancers. Both experimental and clinical studies show that HIPEC after CRS has adverse effects on anastomotic healing. In this study, the results of the combined use of HIPEC and the surgical method were designed on rats experimentally.

The study was carried out with the approval of the Local Ethics Committee. Thirty-five male Wistar-Albino rats were used in the study. Five donor rats were used to prepare the PRP. The blood was centrifuged at 2500 rpm. In the tube, three layers were seen after the first turn; red blood cells on the bottom, light yellow plasma on top, and a buffy coat among others. Plasma and buffy coat were transferred to another sterile tube and approximately 1 mL of PRP was collected at the bottom of the tube. PRP was mixed with thrombin (Human Thrombin Lyophilized, Baxter, New Jersey) and calcium chloride to activate and obtain the viscous gel form of PRP. Rats were divided into three groups. Group 1: Control group (CG, n = 10); End-to-end colonic anastomosis (joining) was performed after severing the left colon, followed by application of hyperthermic saline. Group 2: Cisplatin group (Cis-G, n = 10); End-to-end colon anastomosis was performed after transection (removal) of the left colon followed by Cisplatin and HIPEC. Group 3: Cisplatin and PRP group (CisP-G, n = 10); An end-to-end colonic anastomosis was performed and PRP gel was applied to the anastomosis site after the left colon was cut, followed by Cisplatin and HIPEC. The rats were anesthetized and after left colon transection, a single layer end-to-end anastomosis was performed. Then, an entry catheter into the right supradiaphragmatic space and an exit catheter into the pelvis were placed. In the Cis-P group, PRP was applied around the anastomosis. In the Cis-G and CisP-G groups, 5 mg/kg cisplatin in 300 µmL saline was perfused with a cylinder pump for 90 minutes. The perfusate (liquid to be introduced, perfused) was heated with a heating plate and the temperatures of both the perfusate and the abdomen were monitored with a digital thermometer. The results and treatment planning processes were presented by enriching with the art of medical illustration. This experimental study is the first study of the effect of PRP and HIPEC administration on colon anastomosis in a rat model.

In conclusion, despite the potential concerns, we suggest that PRP gel application can facilitate colonic anastomosis healing and reduce stoma rates in HIPEC. Since the study is an experimental study, these results should be supported by clinical studies. we believe that PRP and HIPEC will reduce stoma-related complications as well as stoma rates in intestinal anastomoses in humans undergoing total cytoreductive surgery.

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Biography

İlker Cihan Güllü had completed his studies from Ondokuz Mayıs University, Fine Arts Faculty, Medical Illustration Department, Turkey. His research interests are Experimental animal models. He had published nearly 27 research articles in the international journals.

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