Official Title: Use of Leukocyte and Platelet-rich Fibrin Plasma (L-PRF) for the Prevention of Anastomotic Leakage in Colorectal Anastomosis

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Study design

We will perform a randomized one blinded clinical trial with a total of 106 patients from the Surgical service of Hospital Guillermo Grant Benavente, in Concepción, Chile, submitted to elective colorectal anastomosis with mechanic anastomosis on or under the peritoneal reflection, with postoperative evaluation using contrast enema to objectify subclinical leak. Exclusion criteria will be age under 15 years, American Association of Anesthesiologists (ASA) grade IV or higher, clinical signs of peritonitis, other major surgeries within 30 days of the procedure, deficient nutritional state (defined by plasmatic albumin levels lower tan 2.8 mg/dl), active treatment with corticoids and the impossibility of having contrast enema post-surgery.

Patients will be randomly assigned to experimental or control groups following a 1:1 ratio, by the team of surgeans the same day the surgical board was announced.

This study has been approved by the Ethical and Scientific Committee of Health Service of Concepción city. All participants will be explained their rights and were asked for their consent to enroll them in the study. On the other hand, anonymity and confidentiality of the participants will be assured during the study, as the patient's personal information was not included in the research database, which will be administered only by the main investigator and the statistical analyst.

This study will be held following the recommendations of Helsinski Declaration and World Medical Association.

Sociodemographic and clinical parameters

The following variables will be taken into account: (a) sociodemographic (age, gender); (b) clinical: body weight index (BMI), patient prognosis based on their comorbidities (ASA criteria, Chralson Score and preoperative albumin levels; (c) procedural: indication (oncologic, transit reconstruction, volvulus, sigmoid fistula,dolicocolon), type of surgery (sigmoidectomy, anterior rectal resection, reconstruction), drainage (yes or no), surgical approach route (open, laparoscopic); (d) main outcomes: surgical complications (Clavien-dindo classification), anastomotic dehiscence (yes or no), hospitalization days and mortality.

Surgical intervention

L-PRF will be obtained from a blood sample from each patient in the experimental group through Vacutainer ® system, using a sterile, double-ended needle, with a retractable sleeve that allows multiple samples to be taken, and collector tubes without additives. About eight blood tubes will be collected for each patient, with a maximum extraction of 80cc. Samples will be centrifuged for 12 min at 2700 rpm obtaining 3 phases; a lower fraction of red blood cells, a middle one with fibrin clots and the supernatant containing exudate without plasma.

Once the preparation is obtained, the fibrin clot will be extracted in aseptic conditions, and crushed for 5 min with a pressure that does not exceed 80 milligram, using a pre-designed device with the appropriate weight (PRF-kit).

Finally, the L-PRF membranes will be put over the anastomotic zone, after the exteriorization of the circular stapler punch, with full coverage of the region, leaving the membranes in contact with the bloody zone of anastomosis. For open surgery, L-PRF membranes were will be put manually and for laparascopic surgery, they will be introduced by a 12mm trocar and positioned with laparoscopic forceps.

Postoperative outcomes

Anastomotic leak will be defined as a communication between intraluminal and extraluminal compartments due a defect in the intestinal wall anastomosis. An abscess in the proximity of the anastomosis and leakage of extraluminal contrast enema was considered an anastomotic leak.

Invasive treatment of surgical complications will be defined as any invasive procedure performed after the primary surgery, including radiological drainage.

Complications that required re intervention or anastomosis removal, hospitalization days, including hospital re admissions due adverse events, and mortality will be also considered in the analysis.

Data collection

Data will be registered by general surgery and coloproctology residents previously trained by the main investigator. To assure the validity of the registry, tabulations will be performed by two residents independently, being later contrasted. For the data registry Microsoft Excel 2011 version will be used.

Statistical analysis.

An exploratory analysis of the data will be performed by calculating averages and standard deviations, along with absolute and relative frequencies. For comparing quantitative variables in two independent samples, Mann Whitney U test will be used. On the other hand, to study the association between two nominal variables with two categories, Fisher exact test and the Chi-square test of independence will be used. The significance level will be set in a p value $\leq$ de 0,05. Stata 14.0 will be used as the statistical analysis software.