

Experimental study of sutureless colorectal anastomosis.

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Abstract:

BACKGROUND/AIMS: The present research project has been made mainly with the idea of comparing the tensile strength values and histological answers of three types of colon anastomosis: sutured with silk 5/0; polyglycolic acid 5/0; and sutureless anastomosis with human fibrin gum.

METHODOLOGY: One hundred and five (105) Wistar breath rats allocated into 3 groups of 35 animals were used to implement this experimental research project: silk, polyglycolic acid and human fibrin gum. Furthermore, each group was subdivided in 5 series respectively to carry out an experimental study on the tensile strength parameter and anatomic-pathological determinations on the 10th, 20th, 30th, 40th and 50th day after the surgical intervention. The following surgical interventions were practiced on them: A cross section of the colon, followed by: group 1: an end-to-end discontinuous suture anastomosis with Silk; group 2: an end-to-end discontinuous suture anastomosis with polyglycolic acid; group 3: sutureless anastomosis with human fibrin gum. On the 10th, 20th, 30th, 40th and 50th days we proceeded to measure the anastomosis' tensile strength value for each series. We used a tensile strength apparatus and waited until the break down of the suture sample took place and wrote down the value, in g/cm, given by the voltmeter at that moment.

RESULTS: The results obtained indicate that anastomosis made in group 1 (silk) lasted longer to the tensile strength apparatus; followed by those practiced in group 2 (polyglycolic acid); and finally anastomosis carried out in group 3 (human fibrin gum). However in the anastomotic process carried

out with the human fibrin gum the healing started from the 10th day. In the same period of time we carried out the following anatomic-pathological determinations: a) sharp inflammation; b) edema; c) non-specific chronic inflammatory infiltrate; d) granulomatous inflammatory infiltrate to foreign bodies; e) fibrosis.

CONCLUSIONS: The results show a better answer for anastomosis made with human fibrin gum than those carried out with the two other suture materials. This conclusion is based on the facts that the human fibrin gum used to carry out sutureless anastomosis during this research project generated a lower sharp inflammation and speediness in its absorption; absence of granular reaction to a foreign body; a minor or non-existent edema at all; as well as a good fibrous healing speediness process. Therefore, all these experimental results lead us to conclude that the human fibrin gum used to carry out sutureless anastomosis may be an alternative to the handmade conventional anastomosis. Moreover they are easy to be implemented.