



Original Article

Comparative evaluation of healing response between colo-colic invagination anastomosis and single-layer running suture. Experimental study in dogs



Miguel Augusto Arcoverde Nogueira^a, Francisco Sérgio Pinheiro Regadas^{b,*},
Carlos Renato Sales Bezerra^{a,c,d}, Wellington Ribeiro Figueiredo^{d,e},
Erbert Portela Martins Filho^e

^a Universidade Estadual do Piauí (UESPI), Escola de Medicina, Teresina, PI, Brazil

^b Universidade Federal do Ceará (UFC), Escola de Medicina, Fortaleza, CE, Brazil

^c Programa de Cirurgia Abdominal, Universidade Estadual do Piauí (UESPI), Teresina, PI, Brazil

^d Universidade Federal do Ceará (UFC), Fortaleza, CE, Brazil

^e Faculdade Integral Diferencial (FacidDevry), Teresina, PI, Brazil

ARTICLE INFO

Article history:

Received 18 March 2016

Accepted 13 April 2016

Available online 27 May 2016

Keywords:

Anastomosis

Wound Healing

Colon

ABSTRACT

Objective: Evaluate healing response of colo-colic anastomosis by invagination vs. single-layer suture.

Methods: Sixty dogs were randomly distributed in two groups and anastomosed with single-layer suture (G-I, control) or by invagination and cardinal sutures (G-II, study). In the end, the animals were euthanized (10 from each group on POD7 and 20 on POD21) and the anastomosed segment was retrieved for histology and immunohistochemistry. Parameters included body weight, adhesions, edema, vasoproliferation, type I and III collagen, myeloperoxidase and nitric oxide. Findings were analyzed with Student's t test and the Mann-Whitney test.

Results: No animal died prior to euthanasia. The groups were similar with regard to all parameters: median weight 10.86 kg (G-I) and 9.98 kg (G-II) on POD7 ($p=0.41$) and 11.86 kg (G-I) and 11.55 kg (G-II) on POD21 ($p=0.71$); abdominal adhesions ($p=0.7383$ POD7; $p=0.5685$ POD21), level of edema ($p=0.3006$ POD7; $p=0.7990$ POD21), vasoproliferation ($p=0.1191$ POD7; $p=0.0758$ POD21), type I collagen ($p=0.4591$ POD7; $p=0.3357$ POD21), type III collagen ($p=0.2166$ POD7; $p=0.2712$ POD21), nitric oxide ($p=0.3980$ POD7; $p=0.4796$ POD21) and myeloperoxidase ($p=0.580$ POD7; $p=0.755$ POD21).

Conclusion: No significant difference in healing response was observed between the two anastomosis techniques (single-layer suture and invagination).

© 2016 Sociedade Brasileira de Coloproctologia. Published by Elsevier Editora Ltda. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

* Corresponding author.

E-mail: sregadas@hospitalsaocarlos.com.br (F.S.P. Regadas).

<http://dx.doi.org/10.1016/j.jcol.2016.04.008>

2237-9363/© 2016 Sociedade Brasileira de Coloproctologia. Published by Elsevier Editora Ltda. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Avaliação comparativa da resposta cicatricial entre anastomose colóclica por invaginação e sutura contínua em plano único. Estudo experimental em cães

R E S U M O

Palavras-chave:

Anastomose
Cicatrização de ferida
Cólon

Objetivo: Avaliar a resposta cicatricial da anastomose colóclica por invaginação *versus* sutura em plano único.

Métodos: Sessenta cães foram randomicamente distribuídos em dois grupos e anastomosados com sutura em plano único (G-I, controle) ou por invaginação e suturas cardinais (G-II, estudo). Ao final, os animais foram submetidos à eutanásia (10 de cada grupo no 7º dia do pós-operatório [DPO7] e 20 em DPO21) e o segmento anastomosado foi recuperado para estudos histológicos e imunistoquímicos. Os parâmetros foram: peso corpóreo, aderências, edema, vasoproliferação, colágeno dos tipos I e III, mieloperoxidase e óxido nítrico. Os achados foram analisados com os testes t de Student e de Mann-Whitney.

Resultados: Não ocorreram óbitos antes da eutanásia. Os grupos eram semelhantes com relação a todos os parâmetros considerados: peso mediano 10,86 Kg (G-I) e 9,98 Kg (G-II) em DPO7 ($p=0,41$) e 11,86 Kg (G-I) e 11,55 Kg (G-II) em DPO21 ($p=0,71$); aderências abdominais ($p=0,7383$ DPO7; $p=0,5685$ DPO21), nível de edema ($p=0,3006$ DPO7; $p=0,7990$ DPO21), vasoproliferação ($p=0,1191$ DPO7; $p=0,0758$ DPO21), colágeno tipo I ($p=0,4591$ DPO7; $p=0,3357$ DPO21), colágeno tipo III ($p=0,2166$ DPO7; $p=0,2712$ DPO21), óxido nítrico ($p=0,3980$ DPO7; $p=0,4796$ DPO21) e mieloperoxidase ($p=0,580$ DPO7; $p=0,755$ DPO21).

Conclusão: Não foi observada diferença significativa na resposta cicatricial entre as duas técnicas de anastomose (sutura em plano único e invaginação).

© 2016 Sociedade Brasileira de Coloproctologia. Publicado por Elsevier Editora Ltda. Este é um artigo Open Access sob uma licença CC BY-NC-ND (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

Colorectal surgery is one of the modalities of digestive system surgery most strongly associated with postoperative complications. Unsurprisingly, Hippocrates (460–377 BC) considered it unfeasible. In the sixteenth century, morbidity rates were still prohibitive, but prognosis improved considerably in the twentieth century with the advent of antibiotic therapy.^{1,2}

Much effort has been put into improving the methods of colorectal anastomosis in order to reduce complications. Advances include new types of thread which induce less tissue inflammation, devices such as staplers and entirely novel surgical techniques. These advances have significantly reduced the rate of anastomotic dehiscence. Nevertheless, dehiscence remains an important risk factor for postoperative mortality in colorectal surgery.²⁻⁵

Anastomosis by invagination was first performed by Sonnenburg in the late nineteenth century,⁶ but the case (ileocolic anastomosis) was not described in detail. More recently, a technique of gastroesophageal anastomosis based on the invagination of gastrointestinal tract segments was described in a patient with megaesophagus submitted to esophagectomy.⁷

Anastomosis by colo-colic invagination was recently evaluated in dogs with regard to inflammatory and healing parameters to determine the advantage of bowel preparation.⁸

The purpose of this experimental study is to evaluate the healing response of colo-colic invagination anastomosis comparing with single-layer running suture.

Materials and methods

Sixty healthy female mongrel dogs (*Canis familiaris*) weighing 8.0–19.5 kg were used in this study. The animals were supplied by the municipal dog pound of Teresina (Piauí, Brazil) and quarantined for 15 days at a private veterinary clinic affiliated with the School of Medical Sciences of Piauí State University (UESPI). The animals were kept in separate cages, vaccinated against rabies and evaluated at baseline and perioperatively by a Veterinarian. After the quarantine, the animals were randomly distributed (Microsoft Excel[®]) in two groups of 30 animals each. In Group I (Control), the animals were submitted to end-to-end colo-colic anastomosis with single-layer running suture using polypropylene thread size 000 and in Group II (Study), the animals were submitted to end-to-end colo-colic anastomosis by invagination (introducing the proximal segment into the distal lumen), secured by four cardinal sutures using polypropylene thread size 000.

Surgical technique

All the animals from both groups were submitted to preoperative bowel preparation (Rectal Enema) with 100 mL glycerin solution (12%) using a 14-French rectal catheter each 8 h during the 24 h before the procedure. It was kept a liquid diet (without residues) on the procedure's day. Prophylactic antibiotic was done (Penicillin 40,000 U/kg i.m. and Metronidazole 30 mg/kg i.v.) before the anesthesia and kept each

Download English Version:

<https://daneshyari.com/en/article/4296954>

Download Persian Version:

<https://daneshyari.com/article/4296954>

[Daneshyari.com](https://daneshyari.com)