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The Left Hemicolectomy: Tecnical Reflections Towards Standard and Enlarged Procedures

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The Left Hemicolectomy: Tecnical Reflections Towards Standard and Enlarged Procedures

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Abstract

The technique of left hemicolectomy (LHC) must be based on the vascular anatomy of the colon, in order to obtain an adequate lymphoadenectomy, and to assure a sufficient vascular supply to the colonic limbs, that have to be anastomosed. In particular cases this procedure can be extended to excise also the entire transverse colon, or the rectum.

Introduction

LHC is considered the standard operation for left sided colonic tumours, and, secondarily, for other non neoplastic conditions, as sigmoid volvulus, diverticular diseases, etc.(1). Essentially this surgical technique is based on the vascular anatomy of the colon, and, in case of oncological indications, on the corresponding lymphatic network. Recall of these fundamental principles, and discussion of the possible extensions of this technique, is the aim of the following paper.

Methods

Classical colonic dissection starts with high division of the inferior mesenteric artery (IMA) incorporating the corresponding apical lymphonodes. Similarly, the inferior mesenteric vein is transected at its junction with the splenic vein (2,3,4,5). Possibly, these steps are performed following the “no touch” technique. The mesentery of the left colon is mobilized from the retroperitoneum and superiorly detached from the lower edge of the pancreatic capsule, till the pedicle of the middle colic vessels . While performing this manoeuvre the left colic vessels and their ascending branches are divided giving a greater mobility to the mesentery of the transverse colon, but respecting the marginal arcade and its collaterals. The greater omentum is almost completely freed .

In this way it is possible to remove the left flexure, the descending colon and the sigmoid and to perform an anastomosis, between the middle transverse colon and the upper rectum, sectioned at the recto-sigmoid junction. This large dissection provides a good mobility to the entire transverse colon, so permitting a “tension free” anastomosis with the rectal stump, usually at the level of the sacral promontory (6) (Illustration 1).

The possible bidirectional lymph flow form colonic tumours justifies the large lymphadenectomy, which is so obtained.

This classical LHC can be differently extended, usually for synchronous tumours

At first, it can be associated to a protectomy, with subsequent anastomosis between the transverse colon and the lower rectum. This procedure, which has to be considered a true“procto-left hemicolectomy”, includes a complete mobilization of the entire transverse colon and, if necessary, also of the right flexure. The proximal part of the transverse colon preserves its vascular supply from the middle colic vessels, whose pedicle is the pivot around which the proximal colonic limb turns to reach the pelvic floor (Illustration 2).

An analogous procedure of extended LHC can be performed when it is necessary to remove also the entire transverse, with subsequent anastomosis between the ascending colon and the rectum. In this case the classical procedure of LHC continues with division of the middle colic vessels, leaving the ileo-colic and the right colic artery to supply the right colon , which is mobilized and brought down for anastomosis with the rectum (Illustration 3).

Discussion

The aforementioned techniques of LHC respects the vascular anatomy of the colon in order to avoid insufficient blood supply to the proximal and distal colonic segments, prepared for their anastomosis (7,8). The intraoperative instrumental measures of their blood flow have not yet obtained a wide and sure clinical application, and, also to-day, the classical surgical direct controls maintain their value: inspection of the mucosa and checking of arterial bleeding from a cut appendage (9).

Other anatomical considerations can be done regarding variations in the blood supply to the different segments of the left colon.

At the left splenic flexure the marginal artery can be deficient, and the arterial flow be reliant upon small collaterals, often of different and variable calibre(Griffith’s point) (10).

The collaterals of the marginal artery, “vasa recta brevia “ and “longa”, which directly assure blood supply to the colonic wall, can be spaced 2 cm or more apart at the splenic flexure, at the proximal and mid descending colon, while in the ascending, transverse, distal descending and sigmoid the corresponding vessels are spaced 0,5 – 1 cm apart (Fig.4) (11,12).

These anatomical peculiarities advise against uncontrolled use of the splenic flexure or of the proximal descending colon for any anastomosis.

In general, the knowledge of vascular anatomy of the colonic segments to be anastomosed helps to overcome the problems of possible insufficient perfusion encountered after more limited resections, and to reduce the incidence of anastomotic dehiscences (13).

In the above described technique of LHC a “high tie” of the IMA, above the origin of the left colic artery, is supported by many anatomical considerations: it permits a subsequent section of the mesentery of the left flexure, increases mobility to the transverse colon, and excludes, from anastomosis, the colonic segments, left flexure and proximal descending, with possible uncertain vascular supply.

During high ligation of the IMA damage of the para-aortic sympathetic nerves must be avoided by a precise dissection, at a sufficient distance from the aortic wall, permitting to these vegetative trunks to remain dislocated in the retroperitoneum.

Conclusion(s)

LHC, if correctly performed , must not be considered an unjustified too invasive procedure, especially considering the modern methods of intra- or post-operative care. On the contrary, it permits a radical lymphadenectomy, a safe control of the blood supply and an adequate mobility to the proximal colonic limb, which has to be anastomosed.

The standard procedure of LHC can be easily extended, always following the main basic principles of dissection, to excise the entire transverse colon, or the rectum.

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Illustrations

Illustration 1

Anatomical basis of LHC: an adequate blood supply is assured to the transverse colon, prepared for anastomosis, through the marginal artery.

Illustration 2

Extended LHC to the whole transverse colon, with subsequent anastomosis between the ascending colon and the upper rectum.

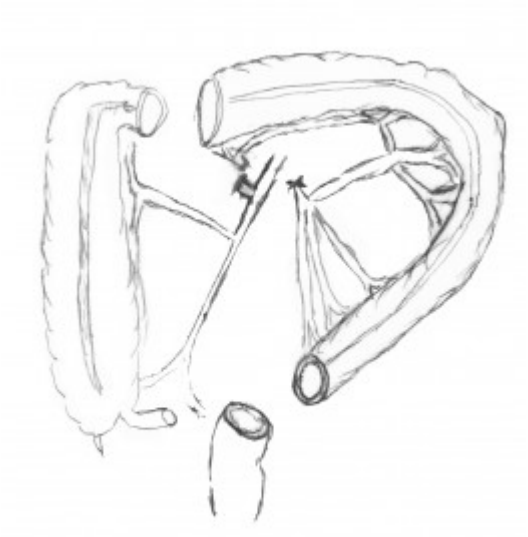

Illustration 3

Extended LHC to the rectum, with subsequent anastomosis between the transverse colon and the “ultralow” rectum.

Illustration 4

Anatomical figure of colonic vascular anatomy: dotted lines in the left flexure and descending colon, possibly ischemic after high tie of the IMA.

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