

Title: Intermediate approach for laparoscopic right hemicolectomy

Running Title: Intermediate approach

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In recent years, as is well known, laparoscopic colon surgery has greatly facilitated patients' subsequent recovery¹. Recent meta-analysis^{2,3} comparing the open and laparoscopic approach for right colectomy enhance the advantages of this approach. Laparoscopic right hemicolectomy for malignant disease is then considered a safe and effective treatment, providing good oncological outcomes and enhancing postoperative recovery. Since the technique of laparoscopic oncological right hemicolectomy was first described, numerous techniques for the sectioning of colic vessels have been described (medial dissection, lateral dissection, down to up dissection and up to down dissection).

In the lateral approach, traction applied to the hepatic angle of the colon may injure the veins of the Henle trunk and provoke serious bleeding. Moreover, the root of the mesentery remains attached to the retroperitoneum, hampering access to the superior mesenteric vessels. In view of these drawbacks, use of the lateral approach has declined in recent years⁴ in favour of the alternative medial approach^{5,6}.

Another technical variable is Complete Mesocolic Excision (CME), defined as a technical gesture within right hemicolectomy consisting of the complete dissection of the visceral plane of the mesocolon, separating it from the retroperitoneal plane without breaking the visceral layer (since this might provoke the dissemination of the tumour cells throughout the peritoneal cavity). CME was first described by Hohenberger et al., working at the University of Erlangen (Germany)⁶, who demonstrated a correlation between anatomic and mesentery-based resection of right-sided colon cancer. Since colectomy with CME was introduced into routine practice at Erlangen University Hospital, five-year cancer-related survival has improved from 82.1% to 89.1%⁶. Furthermore, studies have reported superior long-term oncological results for CME, compared to the traditional technique^{6,7}.

Finally Cho⁸ described another modified technique of CME with central vascular ligation without a Kocher dissection of the duodenum.

Therefore, new surgical approaches are needed to provide a safe laparoscopic procedure that ensures a right hemicolectomy may be carried out under optimum conditions.

We wish to draw attention to the technical possibility of starting the intervention by sectioning the small intestine and then lateral mobilisation of the bowel is performed from the ileum

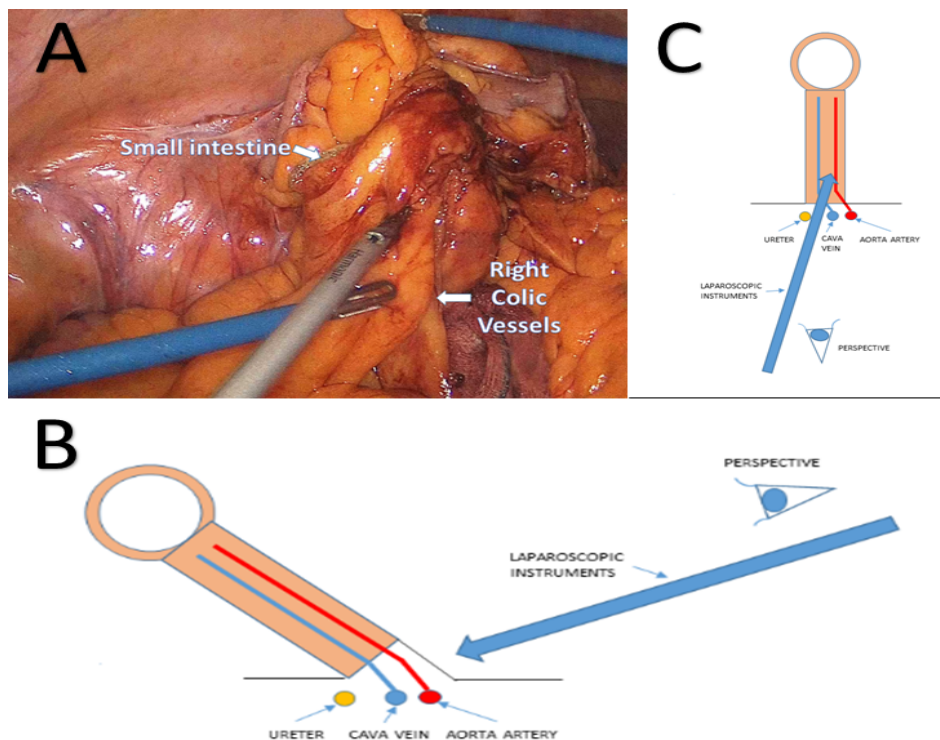


Figure 1A: Our manoeuvre makes it possible to view the anterior and posterior aspects of the mesocolon simultaneously on the monitor
Figure 1B: Laparoscopic right hemicolectomy (classical manoeuvre)
Figure 1C: Laparoscopic right hemicolectomy (our manoeuvre)

to the proximal transverse colon to release the remnant attachments of the bowel from the retroperitoneum, so that the right colon can be elevated and the vessels exposed (intermediate approach). By this means, the ileocolic and the right colic vessels at their origin remains apparent, as does the situation of the ureter.

This manoeuvre makes it possible to view the anterior and posterior aspects of the mesocolon simultaneously on the monitor (Figure 1A). The classical manoeuvre, on the other hand, reveals only the medial aspect, and not the lateral one. In this case, as the mesocolon is resting upon the retroperitoneum (Figure 1B), the right colic vessels are closer to the ureter and to the ileocolic and superior mesenteric vessels, and so there is a greater likelihood of these structures being damaged. With the manoeuvre we describe, the upward traction applied to the mesocolon increases the distance between the colic vessels and the structures to be preserved (Figure 1C).

In order to conduct a right hemicolectomy with CME via laparoscopy, the surgical approach employed must provide safe, controlled access to the mesenteric root, duodenum, pancreatic head and dorsal mesothelial plane. These requirements are met with the intermediate approach, since the upward traction applied to the mesocolon increases the distance between the colic vessels and the above-mentioned structures, which must be preserved.

In addition, this approach enables us to alternate between lateral and medial views by varying the type of traction applied, thus facilitating a complete three-dimensional view of the surgical situation. Accordingly, the CME with central vascular ligation manoeuvre can be performed under the safest conditions possible.

This technique has been used in our hospital for the past two years in laparoscopic right hemicolectomy. In our experience, it has greatly facilitated control of the colic vessels and has also provided spatial control of the location of the duodenum, pancreatic head, right ureter and superior mesenteric vessels, throughout the surgical intervention.

In summary, we believe the application of this manoeuvre would improve the safety of this type of intervention, alleviating the risk of lesions to the superior mesenteric-ileocolic vessels and to the ureter. The intermediate approach described is a promising alternative to the medial approach, offering various theoretical advantages that remain to be confirmed in future clinical studies.

Authors Contribution

FJ Pérez Lara: made a substantial contribution to the concept and design, drafted the article or revised it critically for important intellectual content, approved the version to be published.

JM Hernández González: approved the version to be published.

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