

Simultaneous left colectomy and standard hepatectomy performed by laparoscopy

Hepatectomia regradada e colectomia esquerda simultâneas realizadas por acesso laparoscópico

RENATO MICELLI LUPINACCI¹; MARCEL AUTRAN MACHADO, TCBC-SP²; RENATO ARIONI LUPINACCI, ACBC-SP³; PAULO HERMAN, TCBC-SP²

A B S T R A C T

Laparoscopic approaches have been increasingly used in patients with colorectal or liver cancer. Simultaneous colectomy and hepatectomy are considered safe techniques and present similar oncological results regardless of the location of the primary tumor when there are fewer than four liver metastases, since there is no increase in morbidity or decrease in survival. The development of laparoscopic techniques and materials has made the combined resection of the colon and liver a very attractive option. The aim of this study is to demonstrate the synchronous resection of the sigmoid tumor and single liver metastasis treated by purely laparoscopic colectomy and liver left lateral sectorectomy.

Key words: Colorectal neoplasms. Minimally invasive surgical procedures. Colectomy. Hepatectomy.

INTRODUCTION

Colorectal cancer (CRC) is the third most common cause of cancer in the world in both sexes and the second cause in developed countries. The number of CRC new cases estimated for Brazil in the year 2008 was of 12,490 cases in men and 14,500 in women. These values correspond to a perceived risk of 13 new cases per 100 thousand men and 15 for each 100 thousand women. In the southeastern region, without considering skin tumors other than melanomas, CRC in men is the third most frequent (19/100,000), and in women, the second (21/100,000)¹.

The liver is the most frequent location for CRC hematogenous metastases. A quarter of patients with colorectal carcinoma presents with synchronous liver metastases (LM)².

In patients with isolated liver metastases the extent of liver disease is the primary determinant of survival. In these patients, survival is measured in months when not treated^{3,4}. The average survival varies between five and 10 months, the survival in two years is an infrequent event and survival greater than five years is extremely rare^{2,3}.

The low survival rates in patients with non-resected tumors were the rationale of increasingly aggressive

operations. Liver resections represent the only established chance of cure and/or prolonged disease free survival, with survival rates in five years from 25 to 57%, and are accepted today as the standard treatment for patients with resectable CRC's liver metastases.

Although most patients initially present with non resectable disease due to the size, number, location of lesions and/or inadequate hepatic reserve, simultaneous resection of both lesions can be considered effective in terms of quality of life and costs and does not bring increased levels of morbi-mortality^{5,6}. The potential benefits of minimally invasive approach are the possibility of undertaking a radical operation with reduced hospitalization, best functional results in the short term and early adjuvant chemotherapy treatment⁷.

The laparoscopic CRC surgery is increasingly performed and its oncologic results, superimposable to the conventional access's ones, were well demonstrated in randomized studies^{8,9}.

The first laparoscopic liver resection was reported in 1992 and after this pioneer report many studies have shown that lapa-roscopic hepatectomies, including larger resections of three or more segments, can be safely performed^{7,10-12}. A recent multi-center study on minimally invasive liver resections for LM concludes for their safety,

Work performed in the Instituto Paulista of Surgical Oncology, São Paulo – SP, Brazil.

1. Collaborating Physician, Surgery of the Liver and Portal Hypertension, Department of Gastroenterology, Faculty of Medicine, São Paulo State University – USP, São Paulo – SP, Brazil; 2. Professor, Surgery of the Liver and Portal Hypertension, Department of Gastroenterology, Faculty of Medicine, São Paulo State University – USP, São Paulo – SP, Brazil; 3. Director, Surgical Clinics, Francisco Morato de Oliveira State Public Servers Hospital, São Paulo – SP, Brazil.

Obs.: This article contains a video that can be accessed at: www.scielo.br/rcbv.

feasibility, and oncologic results comparable to classic resections for both small and large hepatectomies¹³. However, despite the increasing use of laparoscopy in colorectal and liver resections, combined purely laparoscopic resection of the primary colorectal tumor and synchronous LM is rarely performed, mainly due to the complexity of hepatic resections during laparoscopy. This way the actual result of this procedure may not yet be fully assessed.

Only a few articles, mostly case reports and small series, were published on resections during laparoscopic combined colon and liver resection for the treatment of CRC. The techniques are variable and often the resections, especially the liver, are carried out through hybrid techniques with the aid of hand ("hand-assisted") or with the dissection by laparoscopy and the resection through small incisions ("laparoscopically assisted")¹⁴⁻¹⁷.

This article is to demonstrate a purely laparoscopic combined resection of a proximal sigmoid tumor and standard left lateral liver segmentectomy, with oncologically satisfactory technique and great functional outcome in a young female patient.

TECHNIQUE

Colon Mobilization: the colon mobilization is undertaken through a standardized technique, with medial to lateral access, primary ligation of the inferior mesenteric vein below the inferior border of the pancreas, followed by ligation of the inferior mesenteric artery near its origin and preservation of the superior hypogastric plexus. The splenic flexure is fully mobilized prior to the section of transverse mesocolon along the anterior aspect of the pancreas; the colon is thus fully mobilized. The identification of the plane of the mesorectum and hypogastric nerves follows. The colon is then kindly laid over the left iliac fossa for the beginning of the hepatectomy.

Liver Resection: after the complete mobilization of the colon, the patient is placed in reverse trendelenburg position. An additional 5 mm port is placed in the epigastric region to assist in the mobilization of the left lateral segment of the liver. The falciform ligament is sectioned until its insertion in the diaphragm. In this case we chose the anterior access to approach the pedicle of segments II and III with transection of hepatic parenchyma till the identification of the glissonian pedicle and its section through an endovascular (white) stapler charge. The section of the parenchyma proceeds with harmonic scalpel until identification of the left hepatic vein, which is divided in its intra parenchymatous portion also with endovascular stapler.

Laparotomy, extraction of hepatic segment, colon resection and colorectal manual anastomosis: we advocate a transverse incision in the left iliac fossa that enables the section of the colon,

satisfactory high rectal dissection and comfortable colorectal anastomosis. After completion of these procedures, the incision is then closed by plans, the surface of liver hemostasis verified and the trocars withdrawn.

This technique was used with success in a female patient aged 51 with a proximal, non-stenosing sigmoid lesion, approximately 30 cm from the anal margin and one single synchronous hepatic metastasis located on segments II and III. The procedure lasted 5 hours and 10 minutes, the estimated bleeding was 70 ml and there was no need for clamping the liver pedicle (Pringle maneuver). The specimens were withdrawn through the left transverse suprapubic incision. The high colorectal anastomosis was performed manually. The postoperative was uneventful and the patient was discharged on the 5th PO. The pathological examination revealed a tumor pT2N0M1 (0/12), the patient was then forwarded to the Oncology Service where she received adjuvant treatment for six months. Nine months after the resection the patient is in good general condition, without signs of tumor recurrence.

DISCUSSION

Nordlinger *et al.*¹⁸ recommend synchronous resections only in minor cases of liver resections and securely approachable by the same abdominal incision. Similar results were found for Bolton and Fuhrman¹⁹, with mortality of simultaneous resections in the presence of four or more bilobars or unilobars LMs of 23.5% compared to 0% for resections in separate times. However, other authors have confirmed the validity of this technique regardless of the location of the primary tumor for smaller hepatectomies^{20,21}. We believe that simultaneous laparoscopic resections must be part of the therapeutic armamentarium of the digestive oncology surgeon with experience in laparoscopic surgery of the colon and liver. The simultaneous partial resection of the colon and liver is a procedure for selected cases of colorectal adenocarcinoma and synchronous LM, being feasible and safe²⁰⁻²².

In this technique, such an hepatic resection is performed without the Pringle maneuver, intestinal anastomosis is not adversely affected by the splanchnic flow or visceral edema. In cases where the Pringle maneuver is routinely used, the intestinal anastomosis prior to the liver resection is recommended. The colon in this case was sectioned out of the abdominal cavity, allowing an excellent exhibition and confirmation of feasibility, adequate perfusion and absence of fecal contamination. The size of the abdominal incision considered the volume of the liver specimen and the need for a proper exposure of the pelvis. The great median incision typically used in these cases was replaced by a small transverse incision, ensuring the functional and aesthetic benefits of the laparoscopic accesses.

R E S U M O

As abordagens laparoscópicas têm sido cada vez mais utilizadas em pacientes com câncer colorretal ou hepático. Colectomia e hepatectomia simultâneas são consideradas técnicas seguras e apresentam resultados oncológicos semelhantes independente da localização do tumor primário quando associada à ressecções hepáticas com menos de quatro metástases, uma vez que não existe aumento da morbimortalidade nem prejuízo na sobrevida. O desenvolvimento de técnicas e materiais laparoscópicos tornou a ressecção combinada do cólon e do fígado uma opção bastante atraente. O objetivo do presente estudo é demonstrar a ressecção de um tumor sincrônico de sigmoide e metástase hepática única tratada por colectomia e setorectomia lateral esquerda puramente laparoscópica

Descritores: Neoplasias colorretais. Procedimentos cirúrgicos minimamente invasivos. Colectomia. Hepatectomia. Laparoscopia.

REFERENCES

1. Brasil. Ministério da Saúde. Brasil. Instituto Nacional do Câncer (INCa). Estimativa 2008: Incidência de câncer no Brasil [online]. Disponível em http://www.inca.gov.br/estimativa/2008/index.asp?link=conteudo_view.asp&id=5.
2. Bengtmark S, Hafström L. The natural history of primary and secondary malignant tumors of the liver. The prognosis for with patients with hepatic metastases from colonic and rectal carcinoma by laparotomy. *Cancer* 1969; 23(1):198-202.
3. Bengtsson G, Carlsson G, Hafström L, Jönsson PE. Natural history of patients with untreated liver metastases from colorectal cancer. *Am J Surg* 1981; 141(5):586-9.
4. Wood CB, Gillis CR, Blumgart LH. A retrospective study of the natural history of patients with liver metastases from colorectal cancer. *Clin Oncol* 1976; 2(3):285-8.
5. Capussotti L, Ferrero A, Viganò L, Ribero D, Lo Tesoriere R, Polastri R. Major liver resections synchronous with colorectal surgery. *Ann Surg Oncol* 2007;14(1):195-201.
6. Weber JC, Bachellier P, Oussoultzoglou E, Jaeck D. Simultaneous resection of colorectal primary tumour and synchronous liver metastases. *Br J Surg* 2003; 90(8):956-62.
7. Simillis C, Constantinides VA, Tekkis PP, Darzi A, Lovegrove R, Jiao L, et al. Laparoscopic versus open hepatic resections for benign and malignant neoplasms—a meta-analysis. *Surgery* 2007;141(2):203-11.
8. Guillou PJ, Quirke P, Thorpe H, Walker J, Jayne DG, Smith AM, et al. Short-term endpoints of conventional versus laparoscopic-assisted surgery in patients with colorectal cancer (MRC CLASICC trial): multicentre, randomised controlled trial. *Lancet* 2005; 365(9472):1718-26.
9. Fleshman J, Sargent DJ, Green E, Anvari M, Stryker SJ, Beart RW Jr, et al. Laparoscopic colectomy for cancer is not inferior to open surgery based on 5-year data from the COST Study Group trial. *Ann Surg* 2007; 246(4):655-62; discussion 662-4.
10. Dagher I, Proske JM, Carloni A, Richa H, Tranchart H, Franco D. Laparoscopic liver resection: results for 70 patients. *Surg Endosc* 2007;21(4):619-24.
11. Koffron AJ, Auffenberg G, Kung R, Abecassis M. Evaluation of 300 minimally invasive liver resections at a single institution: less is more. *Ann Surg* 2007; 246(3):385-92; discussion 392-4.
12. Viganò L, Laurent A, Tayar C, Tomatis M, Ponti A, Cherqui D. The learning curve in laparoscopic liver resection: improved feasibility and reproducibility. *Ann Surg* 2009; 250(5):772-82.
13. Nguyen KT, Laurent A, Dagher I, Geller DA, Steel J, Thomas MT, et al. Minimally invasive liver resection for metastatic colorectal cancer: a multi-institutional, international report of safety, feasibility, and early outcomes. *Ann Surg* 2009; 250(5): 842-8.
14. Kim SH, Lim SB, Ha YH, Han SS, Park SJ, Choi HS, et al. Laparoscopic-assisted combined colon and liver resection for primary colorectal cancer with synchronous liver metastases: initial experience. *World J Surg* 2008; 32(12):2701-6.
15. Leung KL, Lee JF, Yiu RY, Ng SS, Li JC. Simultaneous laparoscopic resection of rectal cancer and liver metastasis. *J Laparoendosc Adv Surg Tech A* 2006; 16(5):486-8.
16. Geiger TM, Tebb ZD, Sato E, Miederna BW, Awad ZT. Laparoscopic resection of colon cancer and synchronous liver metastasis. *J Laparoendosc Adv Surg Tech A* 2006; 16(1):51-3.
17. Patrii A, Ceccarelli G, Bartoli A, Spaziani A, Lapalorcia LM, Casciola L. Laparoscopic and robot-assisted one-stage resection of colorectal cancer with synchronous liver metastases: a pilot study. *J Hepatobiliary Pancreat Surg* 2009; 16(4):450-7.
18. Nordlinger B, Guiguet M, Vaillant JC, Balladur P, Boudjema K, Bachellier P, et al. Surgical resection of colorectal carcinoma metastases to the liver. A prognostic scoring system to improve case selection, based on 1568 patients. *Association Française de Chirurgie. Cancer* 1996; 77(7):1254-62.
19. Bolton JS, Fuhrman GM. Survival after resection of multiple bilobar hepatic metastases from colorectal carcinoma. *Ann Surg* 2000; 231(5):743-51.
20. Jaeck D, Bachellier P, Weber JC, Mourad M, Walf P, Boudjema K. Surgical treatment of synchronous hepatic metastases of colorectal cancers. Simultaneous or delayed resection ? *Ann Chir* 1996; 50(7):507-12.
21. Elias D, Detroz B, Lasser P, Plaud B, Jerbi G. Is simultaneous hepatectomy and intestinal anastomosis safe ? *Am J Surg* 1995; 169(2):254-60.
22. de Santibañes E, Lassalle FB, McCormack L, Pekolj J, Quintana GO, Vaccaro C, et al. Simultaneous colorectal and hepatic resections for colorectal cancer: postoperative and longterm outcomes. *J Am Coll Surg* 2002; 195(2):196-202.

Received: 08/07/2010

Accepted for publication in: 18/08/2010

Conflict of interest: none

Funding source: none

How to cite this article:

Lupinacci RM, Machado MA, Lupinacci RA, Herman P. Simultaneous left colectomy and standard hepatectomy performed by laparoscopy. *Rev Col Bras Cir.* [periódico na Internet] 2011; 38(2). Disponível em URL: <http://www.scielo.br/rcbc>

Mailing address:

Dr. Renato Micelli Lupinacci
E-mail: rmlupinacci@gmail.com