Case Report

Laparoscopic left lateral segmentectomy for metachronic metastases of small intestine adenocarcinoma: a case report

SERGIO RENATO PAIS-COSTA[1], SERGIO LUIZ MELO ARAUJO[2], OLÍMPIA ALVES TEIXEIRA LIMA[3], MARCIO ALMEIDA PAES[4], SANDRO JOSÉ MARTINS[5]

[1]In Doctor's Degree Program, Universidade Federal de São Paulo (UNIFESP) – São Paulo (SP), Brazil; Oncologic Surgeon Physician, Hospital Santa Lucia – Brasília (DF), Brazil. [2]Specialist in General Surgery; General Surgeon and Physician of the Hospital Santa Lucia – Brasília (DF), Brazil. [3]Assistant Professor of Surgery at the Universidade de Brasília (UNB) – Brasilia (DF), Brazil; General Surgeon and Physician of the Hospital Santa Lucia – Brasília (DF), Brazil. [4]Head of the Clinical Oncology Service of the Hospital de Base do Distrito Federal – Brasília (DF), Brazil; Oncologist at the Hospital Santa Lucia – Brasília (DF), Brazil. [5]Adjunct Professor of Oncology at the Universidade de Brasilia (UNB); Oncologist at the Hospital Santa Lucia – Brasília, (DF), Brazil.

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ABSTRACT: Hepatectomy has been the standard treatment for metachronic metastases of non-colorectal (NCR) origin, mainly when the disease-free interval is more than two years. Laparoscopic hepatectomy has become the golden standard mainly for left side resections, due to lower morbidity, shorter hospital stay, early recovery and good cosmetic outcome. The authors report the case of a female patient with two metachronic metastases (ten years of disease-free survival), of non-colorectal origin (adenocarcinoma of small intestine), treated by laparoscopic left lateral segmentectomy (left hepatic lobectomy) with success. The postoperative progress was satisfactory. To date, the patient has presented no tumoral recurrence (six months of follow-up period). Laparoscopic left lateral segmentectomy can be satisfactorily performed in selected cases of hepatic metastasis. This approach presents low morbidity and good cosmetic result. The lack of alternative treatments and the poor prognosis of untreated cases have justified surgical resection in order to increase overall survival. Nevertheless, this approach should be performed by hepatic surgery expertise teams trained on advanced laparoscopic procedures.

Keywords: laparoscopy; colorectal neoplasm; hepatectomy; neoplasm metastasis; liver neoplasm/surgery; liver neoplasm/secondary; survival rate.

INTRODUCTION

Hepatectomy has been selected as the curative treatment of choice for metastases of colorectal (CR) origin. In a systematic review recently published by Simmonds et al.[1], the survival rates in 5 years in 16 series, including R0 resection only, range from 15 to 67%, median of 30%. In the same study, postoperative mortality ranged from 0 to 6.6%, median of 3%. Then, the deeper knowledge of anatomy and surgery technique, combined with the increasingly improved support conditions, both in the intraoperative and postoperative periods, has lead to substantially reduced mortality in this operation[1]. In parallel, due to developments in hepatic surgery, hepatectomy has been freely indicated for the treatment of CR metastases, where resection is the only way of healing or extended survival[1-7]. More recently, several series in the literature have also demonstrated

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satisfactory results in the resection of non-colorectal (NCR) metastases. The results, when the NCR metastases resection is performed in selected cases, are similar to those observed in CR metastases resection, with rates in a 5-year survival ranging from 20 up to 45%[8-13]. In our community, the author of this study, in a prior study that compared CR and NCR metastases, observed similar survival, of around 20%, in a 5-year survival for the two groups[7]. Literature shows that this practice has been more freely adopted, especially when the disease remains exclusively confined to the liver, limited to one lobe, and mainly when the disease-free survival (DFS) between the primary tumor treatment and the distant lesion presentation is more than two years[8-13].

Today, laparoscopic resection of metastases has become a reality, especially for lesions in the left hepatic lobe, as it is technically easier to be performed using this access. Laparoscopic hepatectomy (LH) offers many advantages in relation to the open surgery, such as lower morbidity, shorter hospital stay, reduced postoperative pain, reduced bleeding, reduced transfusion, early return to habitual activities, early feeding and good cosmetic outcome. Recent studies show that, in an oncologic perspective, LH does not show any difference in terms of recurrence, margins or survival when compared to the open technique if the principles of radicality are maintained[14-29].

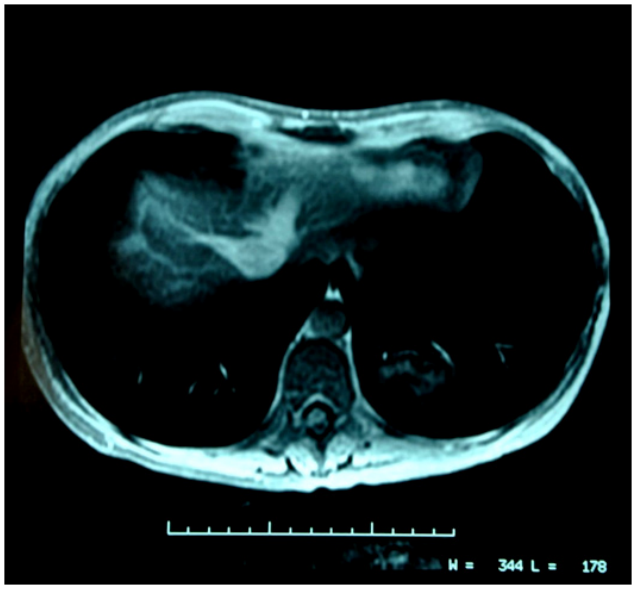

Figure 1. *Nuclear magnetic resonance of the abdomen showing two lesions of 3 cm in the left lobe, segments II-III.*

The authors describe the case of a young female patient with two metachronic metastases (ten years of disease-free survival) in the left hepatic lobe (segments II-III), originated from an adenocarcinoma of small intestine (terminal ileum), who was submitted to a laparoscopic left lateral segmentectomy (left hepatic lobectomy – segments II+III) with success. The postoperative progress was excellent, with six-month disease-free survival so far.

CASE REPORT

A 42-year-old female patient was submitted to a partial enterectomy in the terminal ileum (20-cm resection) with primary entero-entero anastomosis due to an adenocarcinoma of small intestine (TNM staging – T2N0M0) ten years before. No adjuvant treatment was performed at the time, with periodic examinations. In the routine exams, the abdominal control computed tomography showed two 3 cm metastases in the left hepatic lobe (segments II-III). The patient was in excellent conditions in general, with no sign of clinical or radiological extrahepatic dissemination. Staging was complemented with magnetic resonance of the abdomen, which showed these lesions only (Figure 1). A PET-SCAN (positron emission tomography) was also performed, which confirmed an exclusively hepatic disease. The serum dosage of carcinoembryonic antigen was 41.2 ng/mL. As the patient had two small metastases confined to the left lobe and she presented a long disease-free period (ten years between the enterectomy and the presentation of hepatic lesions), the surgical resection was proposed. The laparoscopic procedure was suggested, which has been the medical team's choice to treat lesions in the left hepatic lobe. Five trocars were used, and their sites are illustrated in Figure 2. In the abdominal cavity evaluation, no sign of distant dissemination was observed. Laparoscopic left lateral segmentectomy was then successfully performed, without interoccurrences, using the intrahepatic Glissonian access technique, as described by Machado et al.[29]. No clamping of the liver hilum (Pringle maneuver) was performed. A hemostatic 10 mm *LigaSure* jaw (*Valleylab, USA*) for parenchyma sectioning and a white-loaded endoscopic stapler, of vascular type (*Endogia 45 mm, Ethicon*), for the left hilar elements and left hepatic vein.

The specimen was removed into an *endo-bag*, closed and without contamination, through a small median incision at the previous surgery site (Figures 2 and 3). The patient was fed on the same day (12 hours after the surgery). She did not receive blood, only dipyrone, as an analgesic substance. She presented good progress, without interoccurrences and was discharged from hospital on the third day after the surgery. The histopathological exam showed only two lesions with metastatic adenocarcinoma and neoplasm-free margins. No adjuvant treatment was indicated, only periodic exams. Six months after the surgery, the patient showed no symptoms and no disease recurrence.

DISCUSSION

The resection of NCR metastases has been considered the standard curative treatment in selected cases. Several series have shown the benefit of resection when compared to alternative palliative treatments, such as systemic chemotherapy. Only resection can offer the real chance of healing or extended survival. However, the proper selection seems to be the main rationale of resection. Then, factors such as: patient's good conditions in general; proper nutritional and hepatic reserves; exclusively hepatic lesion; long disease-free survival between the primary tumor treatment and the presentation of metastases; and the NCR metastases etiology itself, seem to be the most important prognostic criteria for long-time survival observed in the literature[7-13].

Laurent et al.[12], when evaluating a series of 39 patients submitted to surgery due to NCR metastases with zero mortality, observed global survival of 35% in the 8-year period. Only the disease-free survival (DFS) over 24 months was a positive prognostic factor for long-term survival at the multivariate analysis (MVA). The primary tumor origin, such as gastrointestinal tract (GIT), genitourinary tract (GUT) or others (sarcomas, breast, melanoma, etc.), was not a criterion of poor prognosis through the MVA. Weitz et al.[9], in a study that analyzed a series of 141 patients from the Memorial Sloan Kettering Cancer Center, in New York (zero mortality and 33% morbidity), observed that the main factors of good prognosis at the MVA were DFS over 24 months and primary tumor etiology

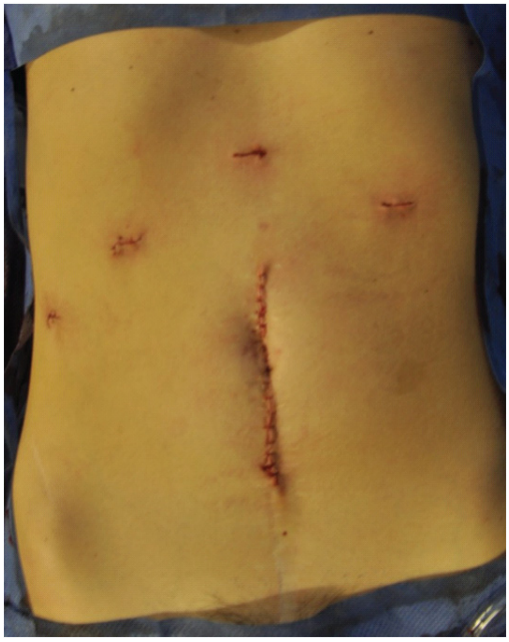

Figure 2. *Sites of trocar utilization. Incision for specimen removal.*

Figure 3. *Left lateral sectorectomy. Note the two metastases in segments II-III (2 cm margin).*

(tumor of reproductive system). However, Hemming et al.[13], in Toronto, Canada, evaluating a series a 37 patients whose postoperative mortality was also zero, reported 45% survival in a 5-year period; at the MVA, no statistically significant difference was observed when compared to the DFS over 36 months. The only two predictive factors of better survival were: origin of non-gastrointestinal primary tumor (NGIT) and neoplasm-free margins.

Ercolani et al.[11], in an Italian study that analyzed 83 cases of resection, observed 34% survival in a 5-year period, also with zero postoperative mortality, while morbidity was 20%. At the MVA, they found only the tumor volume as a prognostic factor for recurrence (metastasis volume larger than 125 cc), although the DFS over one year showed a tendency towards that, but without significance due to the sample size. Specifically when the subgroup of operated primary tumor was analyzed, a statistically significant different was observed between metastases from GIT *versus* GUT tumors, sarcomas or even breast. For GIT tumors, survival was lower than in the others, with 17.3% in 3 years, and 8.4% in 5 years, respectively.

In our community, the author of this study, in a previously published case that analyzed ten patients submitted to resection of metachronic metastases of NCR (DFS over one year), observed 50% survival in a 3-year period, with zero mortality in the hepatectomies performed[8]. In another previous study of the same author, in which ten patients with NCR metastasis were compared to a similar contemporaneous cohort of 20 patients with NCR metastasis, all of them submitted to hepatic resection (all cases operated by the same medical team), no statistically significant difference was observed for survival between the two groups. The criteria of poor prognosis at the MVA in both groups (CR and NCR metastases) were: lymph node involvement (in hepatic hilum or primary tumor) and more than one metastasis[7].

Finally, in the study of greater number of cases found in the literature (although multicenter and retrospective), Adam et al.[10], when evaluating 1,452 patients submitted to resection due to NCR metastases, observed 36% overall survival in a 5-year period (23% in 10-year survival), associated with 2.3% overall mortality and 21.5% morbidity. They found, at the MVA, the following factors of poor prognosis: age over 60 years, primary tumor that is not breast or melanoma cancer, squamous cells in the histological study (epidermoid carcinoma), DFS lower than one year, extra-hepatic disease, resection with positive margin and larger hepatectomy. These authors also described a score, with a mathematical model, that can predict survival based on these prognostic factors. In addition, they sorted the patients according to the MVA and evaluated their long-term survival. Then, the patients were classified according to this score as: low risk (score 0–3, 46% survival in a 5-year period), medium risk (score 4–6, 33% survival in a 5-year period) and high risk (score over 6, survival in a 5-year period lower than 10%).

When applying this mathematical model to this case, the patient would be classified as low risk, combined with her excellent nutritional condition, absence of comorbidities and good hepatic reserve, facts that influenced the selection of resection.

With the development in laparoscopic surgery in general, laparoscopic hepatectomy (LH) has been more freely indicated for the treatment of both benign and malign hepatic neoplasms. Advantages, such as reduced intraoperative bleeding, lower morbidity, shorter hospital stay, early recovery and good cosmetic outcome, have been constantly observed[14-29]. For left-side resections, recently published controlled studies have suggested laparoscopy as the favorite method especially of experienced surgeons in laparoscopic hepatic surgery[15,16]. This fact also influenced the decision on the access method used in this study, as 20 LHs have been performed by the medical team (for both benign and malign tumors) in the last four years[30].

On the other hand, regarding the treatment of malign neoplasm, recent studies have suggested that there is no difference between LH and open hepatectomy to treat metastases in portals, margins, local-systemic recurrence or long-term survival[20,22,23,26,27]. In our community, Machado et al.[24], in a small series of four patients with CR metastasis submitted to LH, have already demonstrated the benefit of LH, which was performed with effectiveness and safety. In a review in the national literature, however, no case of LH used in the treatment of NCR metastasis has been found to date.

This case shows that, when well indicated and performed by a team with expertise in hepatic surgery, particularly in laparoscopic procedures, LH can be an excellent therapeutic option. LH offers innumerous advantages (lower morbidity, reduced postoperative pain, early recovery and good cosmetic outcome), without compromising the oncologic radicality.

CONCLUSION

Laparoscopic left lateral segmentectomy (left hepatic lobectomy) can be satisfactorily performed in selected cases of hepatic metastasis, with lower morbidity and good cosmetic result. The lack of alternative treatments and the poor prognosis of untreated cases of NCR metastasis have justified surgical resection in order to increase overall survival. Nevertheless, this approach should be performed by hepatic surgery expertise teams trained on advanced laparoscopic procedures.

RESUMO: A hepatectomia tem sido o tratamento padrão para metástase de origem não colorretal (NCR) metacrônica, principalmente quando o intervalo livre de doença é maior do que dois anos. A hepatectomia por laparoscopia tem se tornado padrão principalmente para as ressecções à esquerda, haja vista a menor morbidade, menor tempo de internação, reabilitação precoce e melhor resultado estético. Os autores relatam um caso de paciente com duas metástases metacrônicas (10 anos de sobrevida livre de doença), de etiologia não colorretal (adenocarcinoma de intestino delgado), tratada com segmentectomia lateral esquerda (lobectomia hepática esquerda) laparoscópica. Paciente apresentou boa evolução pós-operatória sem recidiva (seis meses de seguimento). Segmentectomia lateral esquerda laparoscópica pode ser satisfatoriamente realizada em casos selecionados de metástases hepáticas, acarretando menor morbidade e melhor resultado estético. A falta de tratamentos alternativos e o prognóstico reservado nos casos de metástases NCR não operadas justificam a ressecção com o objetivo de prolongar a sobrevida. No entanto, essa abordagem deve ser realizada por equipe especializada em cirurgia hepática com treinamento em procedimentos laparoscópicos avançados.

Palavras-chave: laparoscopia; neoplasias colorretais; hepatectomia; metástase neoplásica; neoplasias hepáticas/cirurgia; neoplasias hepáticas/secundário; taxa de sobrevida.

REFERENCES

1. Simmonds PC, Primrose JN, Colquitt JL, Garden OJ, Poston GJ, Rees M. Surgical resection of metastases from colorectal cancer: a systematic review of published studies. Br J Cancer 2006;94:982-99.
2. Fong Y, Fortner J, Sun RL, Brennan MF, Blumgart LH. Clinical score for predicting recurrence after hepatic resection for metastatic colorectal cancer: analysis of 1001 consecutive cases. Ann Surg 1999;230(3):309-21.
3. Adam R. Tratamento das metástases hepáticas do câncer colorretal. In: Correia MM, Mello ElR, Santos CER (Eds). Cirurgia do câncer hepatobiliar. Rio de Janeiro: Revinter; 2003. p. 139-46.
4. Choi EA, Rodgers SE, Ahmad SA, Abdalla EK. In: Feig BW, Berger DH, Fuhrman GM (Eds.) The M.D. Anderson Surgical Oncology Handbook. 4th ed. Philadelphia: Lippincott & Wilkins; 2006. p. 238-47.
5. Minagawa M, Makuuchi M, Torzilli G, Takayama T, Kawasaki S, Kosuge T, et al. Extension of the frontiers of surgical indications in the treatment of liver metastases from colorectal cancer. Ann Surg 2000;231(4):487-99.
6. Scheele J, Altendorf-Hofmann A. Surgical treatment of liver metastases. In: Blumgart LH, Fong Y (Eds.) Surgery of the liver and biliary tract. 3th ed. Edinburgh: WB Saunders; 2000. p. 1475-502.
7. Costa SRP, Horta SHC, Henriques AC, Waisberg J, Speranzini MB. Hepatectomia para o tratamento de metástases colorretais e não-colorretais: análise comparativa em 30 casos operados. J Coloproctol 2009;29(2):216-25.
8. Costa SRP, Horta SHC, Miotto MJ, Costas MC, Henriques AC, Speranzini M. Ressecção hepática para o tratamento de metástases não-colorretais e não-neuroendócrinas: indicações e resultados em 10 pacientes operados. Einstein 2008;6(1):56-62.
9. Weitz J, .Blumgart LH, Fong Y, Jarnargin WR, Dangelica M, Harrison LE, et al. Partial hepatectomy for metastases from noncolorectal, nonneuroendocrine carcinoma. Ann Surg 2005;241(2):269-76.
10. Adam R, Chiche L, Aloia T, Elias D, Salmon R, Rivoire M, et al. Hepatic resection for noncolorectal nonendocrine liver metastasis: analysis of 1452 patients and development of prognostic model. Ann Surg 2006;244(4):534-35.
11. Ercolani G, Grazi GL, Ravaioli M, Ramacciato G, Cescon M, Varotti G, et al. The role of liver resection for noncolorectal, nonneuroendocrine metastases: experience with 142 observed cases. Ann Surg Oncol 2005;12(6):1-8.
12. Laurent C, Rullier E, Feyle R, Masson B, Saric J. Resection of noncolorectal and nonnneuroendocrine liver metastases: late metastases are the only chance of cure. World J Surg 2001;25:1532-6.
13. Hemming AW, Sielaff TD, Gallinger S, Cattral MS, Taylor BR, Greig PD, et al. Hepatic resection of noncolorectal nonneuroendocrine metastases. Liver Transpl 2000;6(1):97-101.
14. Ardito F, Tayar C, Laurent A, Karoui M, Loriau J, Cherqui D. Laparoscopic liver resection for benign disease. Arch Surg 2007;142(12):1188-93.
15. Campos RR, Hernández CM, Conesa AL, Abellán B, Pérez PP, Paricio PP. La ressección laparoscópica de los segmentos del lóbulo izquierdo debe ser el abordaje inicial em centros com experiência. Cir Esp 2009;85(4):214-21.

16. Carswell KA, Sagias FG, Murgatroyd B, Rela M, Heaton N, Patel AG. Laparoscopic versus open left lateral segmentectomy. BMC Surgery 2009;9(14):1-9.
17. Cho JY, Han HS, Yoon YS, Shin SH. Outcomes of laparoscopic liver resection for lesions located in the right side of the liver. Arch Surg 2009;144(1):25-9.
18. Cugat E, Marco C. Cirugía laparoscópica del hígado. Una opción madura? Cir Esp 2009;85(4):193-5.
19. Dulucq JL, Wintringer P, Stabilini C, Berticelli J, Mahajna A. Laparoscopic liver resections: a single center experience. Surg Endosc 2005;19:886-91.
20. Gagner M, Rogula T, Selzer D. Laparoscopic liver resection: benefits and controversies. Surg Clin North Am 2004;84:451-62.
21. Gigot JF, Gilneur D, Azagra JS, Goergen M, Ceuterik M, Morino M, et al. Auspices of the hepatobiliary and pancreatic section of the Royal Belgian Society of Surgery and the Belgian Group for Endoscopic Surgery. Laparoscopic liver resection for malignant liver tumours: preliminary results of a multicenter European study. Ann Surg 2002;236(1):90-7.
22. Kofron AJ, Auffenberg BS, Kung R, Abecassis M. Evaluation of 300 minimally invasive liver resections at a single institution. Ann Surg 2007;246(3):385-94.
23. Lee KF, Cheung YS, Chong CN, Tsang YYY, Ng WWC, Ling E, et al. Laparoscopic versus open hepatectomy for liver tumours: a case control study. Hong Kong Med J 2007;13(6):442-8.
24. Machado MAC, Makdissi FF, Almeida FAR, Luiz-Neto M, Martins ACA, Machado MCC. Hepatectomia laparoscópica no tratamento das metástases hepáticas. Arq Gastroenterol 2008;45(4):330-2.
25. Zhang L, Chen YJ, Shang CZ, Zhang HW, Huang ZJ. Total laparoscopic liver resection in 78 patients. World J Gastroenterol 2009;15(45):5727-31.
26. Pilgrim CHC, To H, Usatoff V, Evans PM. Laparoscopic hepatectomy is a safe procedure for cancer patients. HPB 2009;11:247-51.
27. Nguyen KV, Geller DA. Is laparoscopic liver resection safe and comparable to open liver resection for hepatocellular carcinoma? Ann Surg Oncol 2009;16:1765-7.
28. Machado MAC, Makdissi FF, Galvão FH, Machado MCC. Intrahepatic Glissonian approach for laparoscopic right segmental liver resections. Am J Surg 2008;196:e38-e42.
29. Machado MAC, Makdissi FF, Surjan RC, Herman P, Teixeira AR, Machado MCC. Laparoscopic resection of left liver segments using intrahepatic Glissonian approach. Surg Endosc 2009;23:2615-9.
30. Pais-Costa SR, Araujo SLM, Lima AOT, Chartuni A. Laparoscopic hepatectomy from hepatic tumors: a series of twenty resectable cases. Ann Oncol 2011;22(Suppl 5): 67.

Correspondence to:
Sergio Renato Pais-Costa
SGAS 710/910, Sala 330
CEP 70390-100 – Brasília (DF), Brazil
E-mail: srenatopaiscosta@hotmail.com