# Therapeutic Management of a Single Peritoneal Metastasis in Colorectal Cancer: A Case Report

**Abstract:**

Colon cancer may give rise to peritoneal metastases, which, if few in number and resectable in an operable patient, may benefit from curative therapeutic management, essentially local treatment (mainly surgery) and chemotherapy; surgery first or chemotherapy requires specialist advice. Case report: We report the case of a diabetic patient undergoing dietary hygiene measures, diagnosed with a moderately differentiated and infiltrating colonic adenocarcinoma, with mutation in RAS status and microsatellite stability; and 4 synchronous hepatic metastatic lesions. The patient received neo-adjuvant chemotherapy followed by liver surgery; and FOLFOX-based adjuvant chemotherapy followed by colon surgery. One year after primary surgery, a peritoneal nodule appeared in the pouch of Douglas. The patient was operated on immediately and then treated with adjuvant chemotherapy (capecitabine). Conclusion: it is possible to standardize therapeutic approaches to colorectal cancer metastatic to the liver; but when it comes to peritoneal oligo progression, a situation which is not exceptional, multidisciplinary consultation meetings and broader involvements are needed for therapeutic choices, and their appropriate timing.

**KEYWORDS:** colorectal cancer, oligo progression, peritoneum, treatment

## INTRODUCTION:

Colorectal cancer is the most common digestive cancer, and the fourth in the world after lung, prostate and breast cancer. In recent years, colorectal cancer has benefited from scientific advances in both diagnosis and treatment. It is a disease for which screening is possible, essentially in the case of a personal or family history of adenomatous polyps, inflammatory bowel diseases or colorectal cancer. [1] [2]

Metastatic colon cancer is not synonymous with palliative treatment, especially in the case of resectable liver or peritoneal metastases. Indications for chemotherapy are clear in the case of hepatic metastases; but location of this systemic treatment in relation to surgery in the case of peritoneal metastases is not always obvious, particularly in a patient already treated for liver metastasis, and who has received chemotherapy on several occasions. [3]

In this context, we report the case of a patient followed for colon cancer with synchronous liver metastases, treated with surgery and chemotherapy, who subsequently developed a peritoneal metastasis.

**Case Presentation:**

The patient is 59 years old, with type II diabetes on dietary therapy since 2021, operated in 1999 for hemorrhoids and in 2006 for an ectopic pregnancy.

The patient has no family history of colorectal disease or cancer.

2 months before diagnosis (at the beginning of 2022), the patient had lost weight, which convinced her to consult a doctor. As part of the exploratory workup, a TAP CT scan was ordered, which showed 4 hepatic nodules (right liver), subsequently confirmed on liver MRI. Colonoscopy conducted by a gastrologist showed a tumor process in the left colic flexure, and biopsy was in favor of a moderately differentiated and infiltrative colonic adenocarcinoma, with mutated RAS status and stable microsatellite profile. PET scan showed no other lesions apart from liver metastases.

The patient received 2 cycles of FOLFOX followed by 2 cycles of FOLFIRINOX. A TAP CT scan performed after this chemotherapy showed a 16% of response to neo-adjuvant treatment; and so, surgery for the liver metastases was performed (controlled right hepatectomy + cholecystectomy), followed by adjuvant chemotherapy (3 months of FOLFOX), then surgery for the primary lesion.

A biological monitoring in early 2024 revealed a rise in CEA levels, justifying a thoracic CT scan, abdominal MRI and colonoscopy, which were all free of suspicious lesions.

A PET scan revealed a 60-mm hypermetabolic nodule in the recto-uterine pouch, raising the suspicion of a single recurrent peritoneal disease. Biopsy of this nodule led to the diagnosis of a moderately differentiated adenocarcinoma compatible with the patient's known colonic cancer.

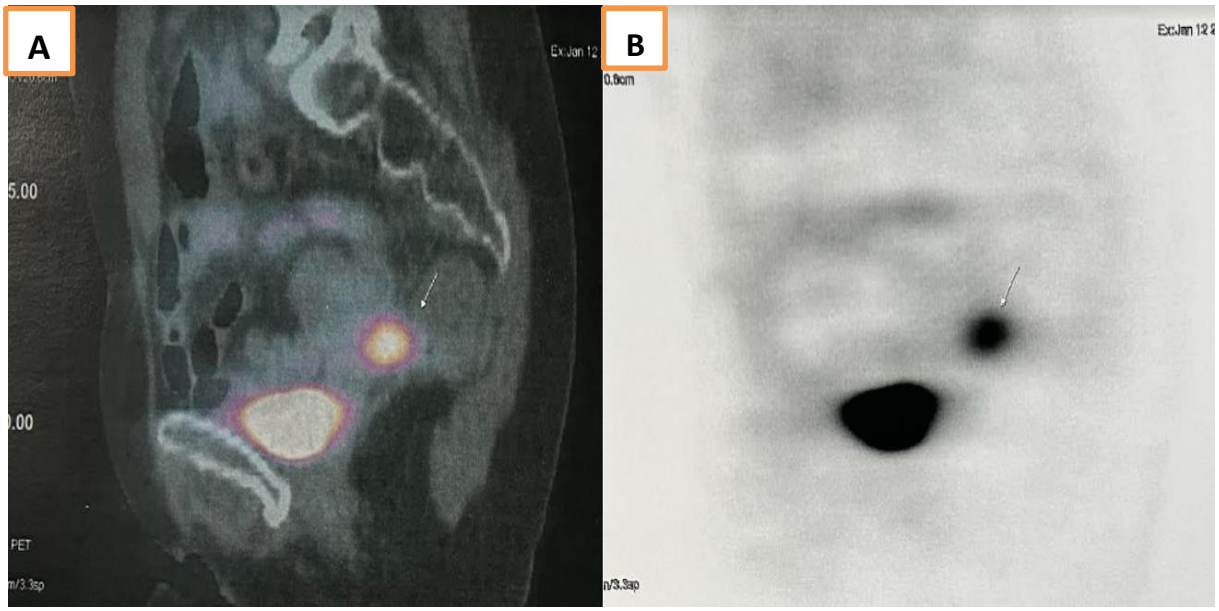


**Figure 1:**

(A) Sagittal section PET-CT showing a pathological hypermetabolic nodule in the recto-uterine pouch with tracer fixation.

(B) PET-CT (MIP image) sagittal section showing a pathological hypermetabolic foci in the recto-uterine pouch

(C) PET-CT (MIP image) in frontal section showing pathological hypermetabolic foci

We were faced with a colon cancer metastatic to the liver (synchronous metastases) treated with chemotherapy and surgery. Which subsequently developed a single peritoneal metastasis.

The nodule was resectable; and in accordance with recent recommendations from the scientific societies of Medical Oncology, and after a medical staff, the decision was made to operate without any neo-adjuvant treatment.

The patient was put on capecitabine after surgery.

**DISCUSSION:**

For patients whose oligo-metastatic disease is confined to a single organ, or few organs or sites (mainly visceral metastases), there is a potentially curative approach; and complete tumor eradication can be achieved by R0 surgical resection and/or A0 ablation. In this context, long-term survival, or even cure, can be achieved in 20-45% of patients who undergo complete resection of their metastases. [4] [5]

The visceral metastases concern: liver, lung and peritoneum; [6] [7]

And the histological subtype in colorectal cancer may influence the site of metastasis. [8]

The overall risk of metachronous peritoneal metastasis after colorectal cancer surgery is low, but is increased in advanced T and N status. [9]

Colorectal cancer with peritoneal metastasis has a poor prognosis. [10] Its management is challenging; It requires multidisciplinary consultation meetings, and more clinical trials. [11]

- In the event of synchronous peritoneal metastasis, discovered at the same time as the primary colon cancer, a complete pre-therapeutic work- up is required, including colonoscopy, Morpho-PET, laparoscopy and biopsies preferably performed by the team that will perform the cytoreductive surgery ± diffusion MRI. [12] [13]

+If surgery is deemed possible (resectable disease and operable patient), it should be performed in a center of expertise; cytoreductive surgery is the standard. However, patients with involvement of six or more regions of the abdominal cavity, or grossly incomplete cytoreduction, may have a grave prognosis. [14] [15]

+If not, systemic chemotherapy is proposed first.

- In the event of metachronous peritoneal metastasis, the therapeutic procedures become even more complicated, especially in patients who have already been treated for metastatic colorectal disease (liver, lung or other). This raises a number of questions: should chemotherapy be given before operating on the peritoneal lesion, or go to surgery directly? Is it possible to start a neo-adjuvant systemic treatment when the patient has recently been treated with chemotherapy? What adjuvant treatment should be introduced?

The latest research in oncology is helping to clarify treatment decisions.

- In case of unresectable metachronous peritoneal metastases, in a patient whose last cycles of chemotherapy were more than 12 months ago, or who has never been treated with chemotherapy, systemic treatment is indicated. The treatment options are FOLFOX, CAPEOX, FOLFIRI or FOLFIRINOX. [16]
  In fragile patients, fluoropyrimidine alone without oxaliplatin can be retained. [17]

  Resectability should be reassessed 2 months later.

- In case of resectable metachronous peritoneal metastases, immediate surgery is proposed. Adjuvant treatment can then be used (observation, capecitabine, 5-FU/leucovorin, CAPEOX, FOLFOX or FOLFIRI). But the place of bevacizumab is not always clear, given the risk of early post-operative complications. [18]

According to some knowledge centers, complete resection from the beginning seems to be the best option when the peritoneal carcinosis is isolated, resectable and with moderate extension (PCI < 15) in a patient in good general condition and without visceral insufficiency. Cytoreductive surgery without intraperitoneal chemotherapy should be performed in an expert center. [19]

For patients at high risk of developing colorectal peritoneal metastases, systematic second-look surgery plus oxaliplatin-HIPEC did not improve disease-free survival compared with standard surveillance. Currently, essential surveillance appears to be adequate and effective in terms of survival outcomes. [20]

**CONCLUSIONS:**

Oligo-metastatic colon cancer is not a rare disease, but its particularity concerns sites of metastases, their numbers, timing of occurrence, and previous treatments.

All these factors require us to ask questions, and unravel them one by one.

**Disclaimer (Artificial intelligence)**
Option 1:
Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.
Option 2:
Author(s) hereby declare that generative AI technologies such as Large Language Models, etc. have been used during the writing or editing of manuscripts. This explanation will include the name, version, model, and source of the generative AI technology and as well as all input prompts provided to the generative AI technology
Details of the AI usage are given below:
1.
2.
3.

REFERENCES:

[1] P. Rawla, T. Sunkara, et A. Barsouk, « Epidemiology of colorectal cancer: incidence, mortality, survival, and risk factors », *Prz Gastroenterol*, vol. 14, nº 2, p. 89-103, 2019, doi: 10.5114/pg.2018.81072.

[2] H. T. Nguyen et H.-Q. Duong, « The molecular characteristics of colorectal cancer: Implications for diagnosis and therapy (Review) », *Oncology Letters*, vol. 16, nº 1, p. 9-18, juill. 2018, doi: 10.3892/ol.2018.8679.

[3] E. T. J. Chandy, H. J. Saxby, J. W. Pang, et R. A. Sharma, « The multidisciplinary management of oligometastases from colorectal cancer: a narrative review », *Annals of Palliative Medicine*, vol. 10, nº 5, Art. nº 5, mai 2021, doi: 10.21037/apm-20-919.

[4] A. Cervantes *et al.*, « Metastatic colorectal cancer: ESMO Clinical Practice Guideline for diagnosis, treatment and follow-up », *Annals of Oncology*, vol. 34, nº 1, p. 10-32, janv. 2023, doi:

10.1016/j.annonc.2022.10.003.

[5] R. Yokoi *et al.*, « Optimizing Treatment Strategy for Oligometastases/Oligo-Recurrence of Colorectal Cancer », *Cancers*, vol. 16, nº 1, Art. nº 1, janv. 2024, doi: 10.3390/cancers16010142.

[6] M. Riihimäki, A. Hemminki, J. Sundquist, et K. Hemminki, « Patterns of metastasis in colon and rectal cancer », *Sci Rep*, vol. 6, p. 29765, juill. 2016, doi: 10.1038/srep29765.

[7] D. Goéré *et al.*, « Is there a possibility of a cure in patients with colorectal peritoneal carcinomatosis amenable to complete cytoreductive surgery and intraperitoneal chemotherapy? », *Ann Surg*, vol. 257, nº 6, p. 1065-1071, juin 2013, doi: 10.1097/SLA.0b013e31827e9289.

[8] N. Hugen, C. J. H. van de Velde, J. H. W. de Wilt, et I. D. Nagtegaal, « Metastatic pattern in colorectal cancer is strongly influenced by histological subtype », *Annals of Oncology*, vol. 25, nº 3, p. 651-657, mars 2014, doi: 10.1093/annonc/mdt591.

[9] S. Ravn, U. Heide-Jørgensen, C. F. Christiansen, V. J. Verwaal, R. H. Hagemann-Madsen, et L. H. Iversen, « Overall risk and risk factors for metachronous peritoneal metastasis after colorectal cancer surgery: a nationwide cohort study », *BJS Open*, vol. 4, nº 2, p. 284-292, janv. 2020, doi: 10.1002/bjs5.50247.

[10] Y. L. Klaver, V. E. Lemmens, S. W. Nienhuijs, M. D. Luyer, et I. H. de Hingh, « Peritoneal carcinomatosis of colorectal origin: Incidence, prognosis and treatment options », *World J. Gastroenterol. WJG*, vol. 18, nº 39, p. 5489- 5494, oct. 2012, doi: 10.3748/wjg.v18.i39.5489.

[11] W. Xia, Y. Geng, et W. Hu, « Peritoneal Metastasis: A Dilemma and Challenge in the Treatment of Metastatic Colorectal Cancer », *Cancers*, vol. 15, nº 23, p. 5641, nov. 2023, doi: 10.3390/cancers15235641.

[12] Gauthé M, Richard-Molard M, Cacheux W et al. Role of fluorine 18 fluorodeoxyglucose positron emission tomography/computed tomography in gastrointestinal cancers. Dig Liver Dis. 2015,
19:S1590-8658

[13] L. Xiang, C. Yang, W. Liu, D. Li, Z. Jiang, et H. Zhou, « Clinical Value of PET.CT Based on Big Data in Colorectal and Peritoneal Metastatic Cancer », *Contrast Media Mol. Imaging*, vol. 2022, p. 6120337, sept. 2022, doi: 10.1155/2022/6120337.

[14] Elias D, Lefevre JH, Chevalier J, Brouquet A et al. Complete cytoreductive surgery plus intraperitoneal chemohyperthermia with oxaliplatin for peritoneal carcinomatosis of colorectal origin. J Clin Oncol. 2009; 27:681-5

[15] Verwaal VJ, van Ruth S, de Bree E, van Sloothen GW et al. Randomizedtrial of cytoreduction and hyperthermic intraperitoneal chemotherapy versus systemic chemotherapy and palliative surgery in patients with peritoneal carcinomatosis of colorectal cancer. J Clin. Oncol. 2003; 21:3737–3743

[16] G. Masi *et al.*, « Treatment with 5-fluorouracil/folinic acid, oxaliplatin, and irinotecan enables surgical resection of metastases in patients with initially unresectable metastatic colorectal cancer », *Ann Surg Oncol*, vol. 13, nº 1, p. 58-65, janv. 2006, doi: 10.1245/ASO.2006.03.094.

[17] G. Rosati *et al.*, « Oxaliplatin-Based Chemotherapy in Patients with Metastatic Colorectal Cancer Aged at Least 75 Years: A Post-Hoc Subgroup Analysis of Three Phase II Trials », *Cancers*, vol. 11, nº 4,

p. 578, avr. 2019, doi: 10.3390/cancers11040578.

[18] Eveno C, Passot G, Goéré D et al. Bevacizumab doubles the early postoperative complication rate after cytoreductive surgery with hyperthermic intraperitoneal chemotherapy (HIPEC) for peritoneal carcinomatosis of colorectal origin. Ann Surg Oncol. 2014; 21:1792-800.

[19] E. de Bree, A. J. Witkamp, et F. A. N. Zoetmulder, « Intraperitoneal chemotherapy for colorectal cancer », *J. Surg. Oncol.*, vol. 79, n° 1, p. 46- 61, janv. 2002, doi: 10.1002/jso.10016.

[20] Goéré D, Glehen O, Quenet F, et al. Second-look surgery plus hyperthermic intraperitoneal chemotherapy versus surveillance in patients at high risk of developing colorectal peritoneal metastases (PROPHYLOCHIP-PRODIGE 15): a randomised, phase 3 study. Lancet Oncol. 2020;21(9):1147-1154.