Chirurgia (2025) 120: 117-124
No. 1, January - February

http://dx.doi.org/10.21614/chirurgia.3083

Colorectal Pancreatic Metastases: A Three-Case Series and Literature Review

Emil Matei[1,2], Silviu Ciurea[1], Vlad Herlea[2,3], Bogdan Mihail Dorobantu[1,2], Catalin Vasilescu[1,2]

[1]Department of General Surgery, Fundeni Clinical Institute, Bucharest, Romania
[2]Carol Davila University of Medicine and Pharmacy, Bucharest, Romania
[3]Department of Pathology, Fundeni Clinical Institute, Bucharest, Romania

***Corresponding author:**
Emil Matei MD, PhD candidate
Department of General Surgery
Fundeni Clinical Institute, Bucharest
Romania
E-mail: emil.matei@drd.umfcd.ro

Abbreviations:
CRC: colorectal cancer,
CRPM: colorectal pancreatic metastasis,
DP: distal pancreatectomy,
IHC: immunohistochemistry,
PCT: polichemotherapy,
PD: pancreatico-duodenectomy,
PM: pancreatic metastasis.

Received: 20.12.2024
Accepted: 15.02.2025

Rezumat

Metastazele pancreatice colo-rectale – o serie trei cazuri și analiza literaturii

Introducere: Metastazele pancreatice sunt tumori rare reprezentând circa 2-5% din patologia malignă a pancreasului. Cele cu origine colo-rectală sunt rare - 1,7%.
Observații clinice: Trei pacienți cu metastaze pancreatice cu origine colo-rectală au fost rezecați în centrul nostru. Examenul anatomo-patologic imunohistochimic postoperator a demonstrat originea colo-rectală. Evaluarea imagistică extensivă a acestor pacienți a exclus boala extrapancreatică şi a permis intervenția chirurgicală.
Rezultate: Trei pacienți cu cancer colo-rectal în antecedente (2 cu neoplasm de colon şi unul cu neoplasm de rect), au fost diagnosticați cu metastaze pancreatice colo-rectale izolate (2 la nivelul capului pancreatic şi una in corpul pancreasului). S-au practicat rezecții pancreatice standard (2 duodeno-pancreatectomii şi o spleno-pancreatectomie coporeo-caudală). Decesul post-operator a survenit la un pacient cu rezecție vasculară asociată. Ceilalți doi pacienți au dezvoltat recidiva extrapancreatică a bolii, doar unul putând fi rezecat, cu evoluție favorabilă, fără recidivă. Celălalt pacient a decedat sub chimioterapie.
Concluzii: Rezecția pancreatică pentru metastaze pancreatice colo-rectale se poate efectua în anumite cazuri selecționate: în cazul pacienților cu boală oligometastatică rezecabilă şi în centre cu experiență în chirurgia pancreatică.

Cuvinte cheie: cancer colo-rectal, metastaza pancreatică, imunohistochimie, rezecție pancreatică

Abstract

Introduction: Pancreatic metastases are very rare tumors comprising 2-5 % of all malignant tumors of the pancreas. Colorectal pancreatic metastases are rare – 1.7%.
Clinical features: Three patients with colo-rectal pancreatic metastasis were

resected in our departament. The immunohsitochemical examination was positive for colorectal origin. Extensive imagistic work-up excluded extrapancreatic disease and allowed the surgical resection.
Results: Three patients with personal history of colorectal cancer (2 – colon, 1 – rectal) were diagnosed with isolated pancreatic metastasis (2 in the head and one in body). Standard pancreatic resections were performed (2 pancreatico-duodenectomies and one distal spleno-pancreatectomy). One patient with associated vascular resection died postoperatively. The other two developed extrapancreatic recurrence and only one was resected (alive and disease free); the other died under systemic therapy.
Conclusions: Surgical resection is recommended in selected patients, surgically fit, with resectable oligometastatic disease, in high-volume center with experience in pancreatic surgery.

Key words: colorectal cancer, pancreatic metastasis, immunohistochemistry, pancreatic resection

Introduction

Pancreatic metastasis (PM) are very rare tumors comprising 2-5 % of all malignant tumors of the pancreas (1-4). The most common primary tumor responsible for PM is renal cell carcinoma (almost 60%) (5), colo-rectal pancreatic metastasis (CRPM) are rare (6-9).

Colo-rectal cancer (CRC) is the most common malignancy of the gastrointestinal tract and the third leading cause of death worldwide. Even in advanced cases of CRC with liver or lung metastases, the multimodal oncological approach, including surgical resection, is associated with improving outcomes. Considering this experience and the refined pancreatic surgical techniques with lower morbidity, isolated CRPM can be resected in selected cases.

We present a retrospective single center experience of CRPM surgical management and a review of the literature.

Clinical Features

Between January 2005 and December 2021, there were three patients resected for CRPM from a total number of 1400 pancreatic resections for malignancy (0.2%), in the Department of General Surgery from the Fundeni Clinical Institute (Bucharest, Romania). CRPM were defined as a tumor confined to the pancreatic parenchyma without local invasion from the primary tumor, lymph nodes or local recurrence. All the patients underwent radical surgery for CRC with a final diagnosis of adenocarcinoma. The immunohistochemical examination of PM was positive for a colorectal cancer origin (CK20 +, CDX2 +, MUC2 +, SATB2 +) (*Fig. 1*) and excluded a primary pancreatic origin (CK7 -). Data collected from the medical records included age, gender, presenting symptoms, CRC site and surgery, CRC TNM stage, adjuvant PCT, tumor markers, CRPM site, interval to development of CRPM, previous or concomitant metastases, type of pancreatectomy, and postoperative course including complications and death. Follow-up data was obtained from the electronic data and medical records. The follow-up was until June 2024.

Approval for the study was obtained from the Commission of Ethics of the Fundeni Clinical Institute.

Results

There were two males and one female. The patients' characteristics are reported in *Table 1*.

The primary tumor (adenocarcinoma) originated in the colon in two patients and in the rectum in one. All the resections were radical and subsequently the patients underwent adjuvant chemotherapy. The CRPM were metachronous and occurred at 7, 12 and 41 months. Two patients were symptomatic (jaundice and abdominal pain, respectively) while one was asymptomatic and diagnosed during the oncological follow-up.

CT scan was performed in all three patients and demonstrated a single pancreatic metastasis located within the head (2 cases), respectively in the body (one case). In one case (case 2) there was a synchronous recurrence at the level of the right iliopsoas muscle with distal ileal invasion. MRI was performed in one patient; PET-CT was available in one patient and showed a single CRPM (case 3 – *Fig. 2*).

Tumor markers (CEA and CA 19.9) were increased in one patient (case 3).

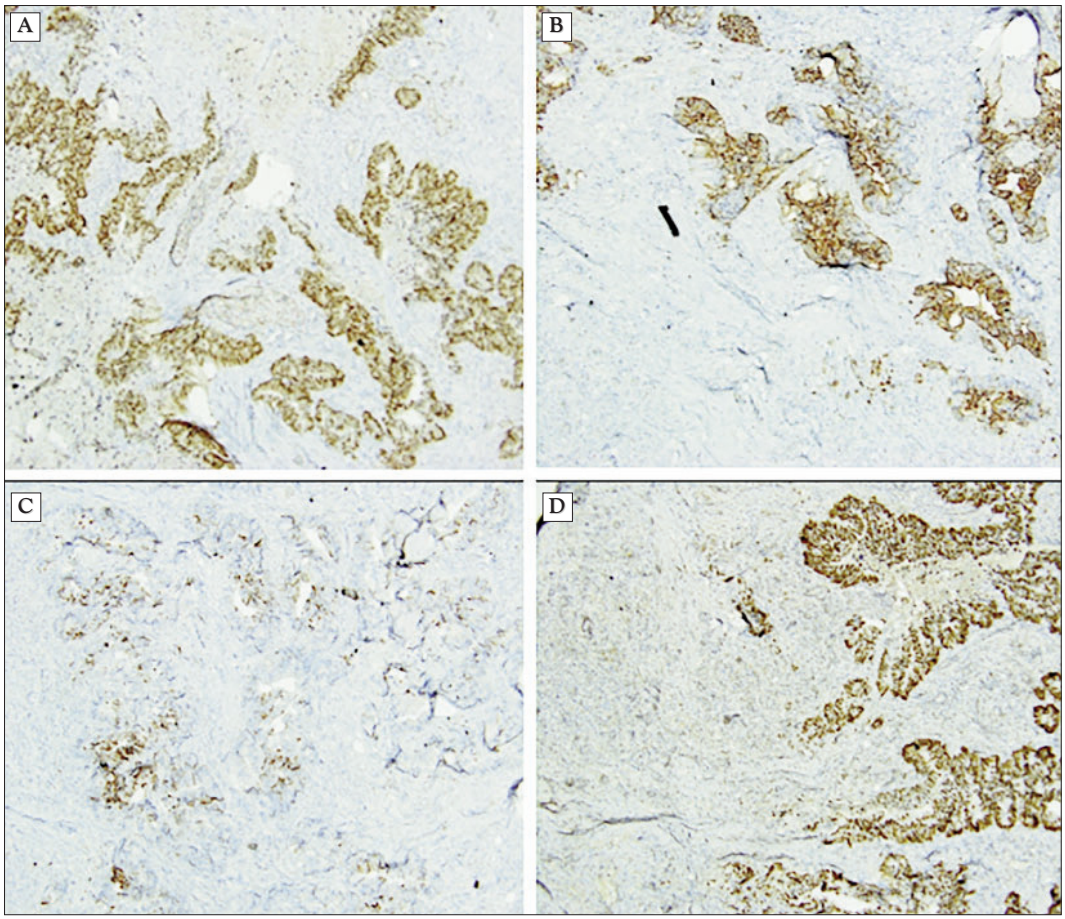

Figure 1. Immunohistochemistry demonstrating the colorectal origin of the PM. (A) CDX2 +; (B) CK20+; (C) MUC 2+; (D) SATB2+

The patients were oncologically reassessed and considering the resectable oligometastatic disease, surgical resection was preferred.

Complete resection of the CRPM was achieved by using standard pancreatic surgery (open approach): two pancreaticoduodenectomies and one distal splenopancreatectomy (*Fig. 3*) were performed. One patient (case 1) underwent a complex vascular surgery – segmental resection of the portal vein with graft interposition. Another patient (case 2) had a synchronous complete resection of the right iliopsoas muscle recurrence and of the ileo-colic anastomotic recurrence (R0 resection).

Postoperative complications were recorded in 2 patients: pancreatic fistula (case 2) – conservatively managed with a favorable outcome, and a biliary leak (case 1) with subsequent surgery for an abdominal abscess with septic shock, multiple organ dysfunctions and death.

The histopathological examination demonstrated the colorectal origins of pancreatic metastasis in all three cases (CK20+, CK7-, CDX2 +).

The surviving patients underwent adjuvant chemotherapy.

Recurrence of the disease was recorded in both patients, for which they underwent chemotherapy; one patient (case 2) was referred to surgery for a mesenteric recurrence at 20 months following CRPM resection, which was resected, with subsequent PCT. The other patient developed multiple metastases in the liver and lungs at 4 months, was treated by chemotherapy and died.

The overall survival time following the CRPM resection were 204 months (case 2) and 30 months (case 3). The disease-free period after the CRPM resection was 20 months (case 2) and 4 months (case 3).

Patient 2 is alive at 17 years after pancreatic resection (18 years after colonic resection).

Table 1. Demographic and clinical details of patients with CRPM undergoing surgical management.

case	1	2	3
gender	M	M	F
age (yr)	58	28	44
tumor markers	Normal range	Normal range	increased (CEA 126 ng/mL, CA 19-9 56 IU/mL)
CRC site	synch colon (transverse and sigmoid)	right colon	rectum
CRC Surgery	total colectomy	right colectomy	LAR
Histology	ADC G1 x2	ADC G1	ADC G1
TNM stage	pT3, pN0, pM0 pT4, pN1, pM0	pT3, pN1, pM0	ypT4, ypN0, ypMx
Adjuvant PCT	yes, NA	yes, FUFOL	Yes, FOLFOX
Previous mets	no	no	no
CRPM site	head	head	body
Time until CRPM (months)	41	12	7
Symptoms	jaundice	pain	no
Number of CRPM	single	single	single
Extra-pancreatic disease	no	right iliopsoatic recurrence with distal ileal invasion	no
Surgery of CRPM	PD with portal resection	PD	DP
Associated surgery	-	iliopsoatic met resection en bloc with ileocolectomy	-
PO complication	biliary leak, abdominal abscess, septic shock, multiple organ dysfunctions	pancreatic fistula	-
Recurrence	no	yes 20 mo	yes 4 mo
Treatment of recurrence	-	surgery and PCT	PCT
Survival (months)	dead (po)	alive at 204	dead at 30

ADC - adenocarcinoma; DP – distal splenopancreatectomy; LAR – low anterior resection; PCT - polychemotherapy; PD – pancreaticoduodenectomy.

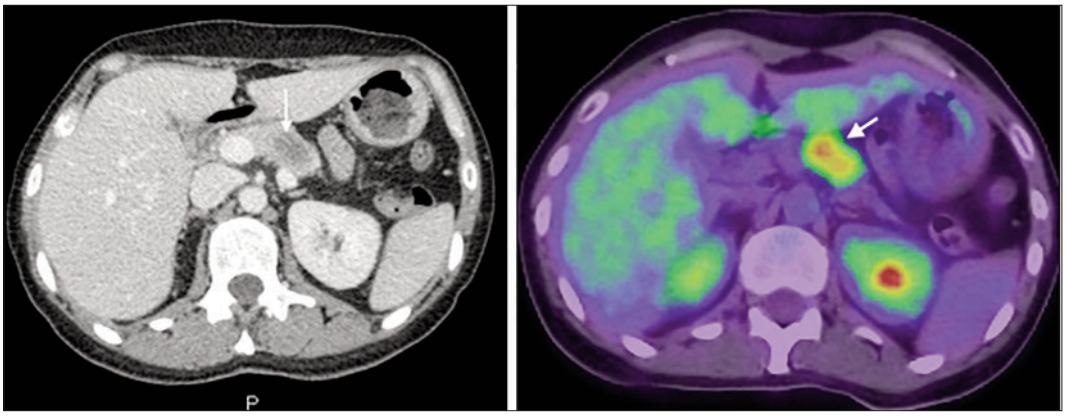

Figure 2. CT and PET-CT showing a single CRPM in the body of the pancreas.

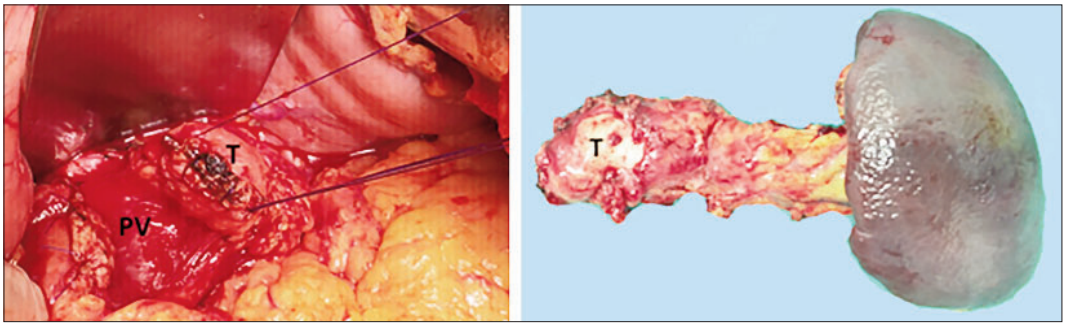

Figure 3. Intraoperative aspect and resection specimen of CRPM in patient 3. T – tumor; PV – portal vein.

Discussion

Pancreatic metastasis are very rare tumors – 2% of all malignancies (1-4). Their primary origin is renal cell carcinoma – 60% (5), followed by colorectal cancer – 1,7% (6-9). CRPM appear late in the evolution of CRC, are rarely isolated and synchronous, most cases having multiple organ metastases (7) and being referred to systemic therapy.

Most of CRPM are metachronous, as in this series, with variable time of appearance. The longest interval from this series was of 41 months (3.41 years) after a rectal carcinoma, in contrast with data from the literature - 11 years after resection of the rectum (10).

CRPM may be preceded by extrapancreatic disease, especially liver or lung. None of our patients had this oncological evolution.

By reviewing the published CRPM cases (*Table 2*), we found a total of 59 patients. Their

Table 2. Colo-rectal pancreatic metastases - review of the literature.

Authors	Year	No. of pts	Site of primary tumor	Interval (months)	Site of CRPM	Pancreatic surgical procedure/alternative	Survival (months)	R**
Eghlimi et al. (15)	2024	1	colon	24	body-tail	NA	NA	NA
Rizza et al. (16)	2023	1	colon	18	tail	NA	NA	NA
Natsui* et al. (17)	2022	1	colon	12	head	PD	21	no
Yoon et al. (18)	2022	1	colon	0	head	No/PCT	NA	NA
Ishii et al. (19)	2022	1	colon	8	tail	DP	29	no
Jiang et al. (20)	2022	1	rectum	120	head, body-tail	TPDS (PD+DP)	24	no
Wu et al. (21)	2022	1	colon	60	body	DP	NA	NA
Shitani et al. (22)	2021	1	colon	11	head	No/ERCP	NA	NA
Yang et al. (23)	2021	1	colon	49	head	PD	17	no
Hirano et al. (24)	2021	1	colon	18	body	palliative DP	54	no
Yagi et al. (25)	2020	1	colon	70	tail	DP	132	no
Numata et al. (26)	2020	1	rectum	42	tail	DP	NA	NA
Kurihara et al. (27)	2019	1	colon	21	head	PD	8	no
Machida et al. (28)	2019	1	rectum	17	head	No/PCT	18	no
Saito et al. (29)	2019	1	rectum	120	tail	DP	NA	NA
Olesinski et al. (30)	2019	1	rectum	40	tail	DP	61	yes
Tani et al. (31)	2019	1	rectum	30	head	PD	65	no
Sakai et al. (32)	2019	1	rectum	80	tail	DP	13	no
Kato et al. (33)	2018	1	rectum	18	head	No/ERCP stenting + PCT	NA	NA
Sano et al. (6)	2017	1	rectum	132	tail	DP	17	yes
Hino et al. (34)	2016	1	rectum	8	head	PD	69	no
Tokuyama et al. (35)	2016	1	colon	59	tail	DP	40	no
Su et al. (36)	2014	1	colon	0	tail	DP	3	no
Farid et al. (14)	2014	4	colon - 1; rectum - 3	12 - 84	head – 2; body – 1; tail - 1	PD - 2; DP - 2	19 - 61	yes -3; no - 1
Li Destri et al. (37)	2014	1	colon	0	head	PD	12	no
Tamagawa et al. (38)	2012	1	rectum	0	tail	DP	8	no
Stoltz et al. (39)	2011	1	colon	24	body	CP	6	NA
Lee et al. (9)	2010	1	rectum	24	tail	DP	12	no
Lasithiotakis et al. (40)	2010	1	colon	24	head	PD	27	yes
Machado et al. (13)	2010	1	colon	108	tail	DP	9	yes
Sperti et al. (7)	2009	9	colon – 7; rectum - 2	0-80 (3 - synch)	head – 5; body-tail - 4	PD – 5; DP - 4	5 - 30	yes - 7
Gravalos et al. (41)	2008	1	colon	1	tail	DP	12	no
Baierlein et al. (42)	2008	1	colon	60	head	PD	NA	NA
Bachmann et al. (8)	2007	2	rectum	24 30	tail body-tail	DP DP	1.5 6	yes yes
Shimoda et al. (43)	2007	1	rectum	44	head	PD	8	yes

Table 2. Cont'd

Authors	Year	No. of pts	Site of primary tumor	Interval (months)	Site of CRPM	Pancreatic surgical procedure/alternative	Survival (months)	R**
Eidt et al. (44)	2007	1	colon	12	head	PD	105	yes
Matsubara et al. (45)	2007	1	rectum	36	head	PD	24	yes
Crippa et al. (46)	2006	1	colon	7	head	PD	13	yes
Torres et al. (47)-Villalobos	2004	1	colon	8	body	DP	6	no
Tutton et al. (48)	2001	1	colon	23	tail	DP	12	no
Pereira-Lima et al. (49)	2000	1	colon	36	dorsal pancreas	GJ	5	-
Le Borgne et al. (50)	2000	1	colon	60	head	PD	12	yes
Inagaki et al. (10)	1998	1	rectum	132	body-tail	DP	8	no
Harrison et al. (51)	1997	2	colon	15 15	head	PD PD	41 21	yes - 2
Nakeeb et al. (52)	1995	1	colon	34	head	PD	43	no
Roland et al. (3)	1989	1	colon	NA	tail	DP	27	no

DP: distal pancreatectomy (distal splenopancreatectomy included); GJ: gastrojejunostomy (palliative bypass); PD: pancreaticoduodenectomy; PPPD: pylorus-preserving pancreaticoduodenectomy. *CRPM on pancreatic neuroendocrine tumor. R** - recurrence after surgery

primary tumor was represented by colon – 37 cases and rectum – 22 cases; CRPM were confined to body and tail of the pancreas – 32 cases and head – 28 cases (one case with multiple CRPM in the head, body and tail).

The symptomatology of CRPM depends on its location. In our series, secondary to a tumor located in the head of the pancreas one patient developed jaundice, another one abdominal pain. The third patient was asymptomatic and diagnosed during follow-up.

The imagistic work-up should be extensive, by using abdominal ultrasound, CT scan, MRI, ERCP, PET-CT (stage IV cancer) and also echoendoscopy - which is mandatory and enables a definitive pre-operative diagnosis by fine needle aspiration. Also, the level of tumoral markers especially CEA and CA 19-9 should be monitored.

According to current treatment guidelines for metachronous resectable colorectal metastases, with or without prior chemotherapy, surgical resection is preferred to local or neoadjuvant therapy (11,12).

Complete resection of the CRPM can be performed by standard or limited (pancreas-sparing surgery) pancreatic techniques. In the literature review (*Table 2*), surgery was performed in 53 patients (out of 59). There were 51 standard pancreatic resections (pancreaticoduodenectomy – 23 cases, distal spleno-pancreatectomy – 27 cases, total pancreatico-duodenectomy with splenectomy – 1 case) and one limited pancreatic resection – central pancreatectomy. A gastrojejunostomy was performed in one patient. In our series, all the patients underwent standard resections.

Multiorgan resection should be performed in surgically fit patients with caution, considering the additional risk factors. In our series, there was a postoperative death in a patient with an extended pancreatic and vascular (portal vein) resection. The other two patients developed minor or no post-operative complication.

The recurrence rate is high. For the resected published cases it was 23/52 = 44.23% (*Table 2*). In our patients, recurrence was recorded in the two surviving patients; one was surgically resected and is still alive and recurrence-free.

Systemic therapy is recommended in all resected patients.

The reported survival period was variable and between 1.5 and 132 months (*Table 2*). Considering the rarity of this pathology, there are no comparative studies between surgery and chemotherapy. Machado et al. (13) consider that the resection of CRPM is only palliative with only exceptional long-time survival. Farid et al. (14) favor the surgical management of CRPM when possible in the light of potential for cure or effective palliation.

Conclusion

Pancreatic surgical resection is recommended in selected patients, surgically fit, with resectable oligometastatic disease, in high-volume center with experience in pancreatic surgery. In the presence of extensive disease, requiring vascular resection with additional risks, caution should be taken.

Conflicts of Interest

The authors declared no potential conflicts of interest.

Reference

1. Nakamura E, Shimizu M, Itoh T, Manabe T. Secondary tumors of the pancreas: clinicopathological study of 103 autopsy cases of Japanese patients. Pathol Int. 2001; 51(9):686-690.
2. Huang Q, Zhou H, Liu C, Jin K, Fan K, Cheng H et al. Surgical Resection for Metastatic Tumors in the Pancreas: A Single-Center Experience and Systematic Review. Ann Surg Oncol. 2019;26(6):1649-1656.
3. Roland CF, van Heerden JA. Nonpancreatic primary tumors with metastasis to the pancreas. Surg Gynecol Obstet. 1989;168(4):345-347.
4. Faure JP, Tuech JJ, Richer JP, Pessaux P, Arnaud JP, Carretier M. Pancreatic metastasis of renal cell carcinoma: presentation, treatment and survival. J Urol. 2001;165(1):20-22.
5. Sellner F. Isolated pancreatic metastases from renal cell carcinoma: an outcome of a special metastatic pathway or of specific tumor cell selection? Clin Exp Metastasis. 2018;35(3):91-102.
6. Sano I, Katanuma A, Yane K, Kin T, Nagai K, Yamazaki H et al. Pancreatic Metastasis from Rectal Cancer that was Diagnosed by Endoscopic Ultrasonography-guided Fine Needle Aspiration (EUS-FNA). Intern Med. 2017; 56(3):301-305.
7. Sperti C, Pasquali C, Berselli M, Frison L, Vicario G, Pedrazzoli S. Metastasis to the pancreas from colorectal cancer: is there a place for pancreatic resection? Dis Colon Rectum. 2009;52(6):1154-1159.
8. Bachmann J, Michalski CW, Bergmann F, Buchler MW, Kleeff J, Friess H. Metastasis of rectal adenocarcinoma to the pancreas. Two case reports and a review of the literature. JOP. 2007;8(2):214-222.
9. Lee CW, Wu RC, Hsu JT, Yeh CN, Yeh TS, Hwang TL, et al. Isolated pancreatic metastasis from rectal cancer: a case report and review of literature. World J Surg Oncol. 2010;8:26.
10. Inagaki H, Nakao A, Ando N, Kotake K, Imaizumi T, Okuda N et al. A case of solitary metastatic pancreatic cancer from rectal carcinoma: a case report. Hepatogastroenterology. 1998;45(24):2413-2417.
11. Cervantes A, Adam R, Rosello S, Arnold D, Normanno N, Taieb J et al. Metastatic colorectal cancer: ESMO Clinical Practice Guideline for diagnosis, treatment and follow-up. Ann Oncol. 2023;34(1):10-32.
12. National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) - Colon Cancer - Version 6.2024. 17-1-2025. https://www.nccn.org/professionals/physician_gls/ pdf/colon.pdf
13. Machado NO, Chopra PJ, Al HA. Pancreatic metastasis from colon carcinoma nine years after a hemicolectomy managed by distal pancreatectomy. A review of the literature regarding the role and outcome of pancreatic resection for colorectal metastasis. JOP. 2010;11(4):377-381.
14. Farid SG, Morley L, Roberts KJ, Morris-Stiff G, Smith AM. Outcomes of surgical resection in the management of colorectal pancreatic metastases. JOP. 2014;15(5):442-447.
15. Eghlimi H, Mirzadeh M, Movahedi H, Tabrizi T. A rare case of colorectal cancer metastasis to the pancreas: a case report. J Surg Case Rep. 2024; 2024(3):rjae173.
16. Rizza S, Maldi E, Laudi C, Mellano A, Pisacane A, Staiano T. A pancreatic metastasis from a colon carcinoma mimicking a primary tumor diagnosed by EUS-guided fine-needle biopsy. Endosc Ultrasound. 2023;12(1):162-163.
17. Natsui H, Kohisa J, Yoshikawa S, Takeuchi M, Yagi R, Minagawa M et al. Tumor-to-tumor metastasis of colon cancer metastasizing to a pancreatic neuroendocrine tumor associated with von Hippel-Lindau disease: a case report. Clin J Gastroenterol. 2022;15(6):1173-1178.
18. Yoon J, Petrosyan A, Wang T, Ameer A. Colonic adenocarcinoma with synchronous metastasis to the pancreas: A case report and literature review. JGH Open. 2022;6(4):274-276.
19. Ishii M, Inoue Y, Matsuo K, Miyaoka Y, Hamamoto H, Osumi W et al. Successful Laparoscopic Treatment of Pancreatic Metastasis From Sigmoid Colon Cancer: A Case Report. J Investig Med High Impact Case Rep. 2022; 10:23247096221074586.
20. Jiang C, Cai Y, Tang Y, Huang J. Multiple pancreas metastases from rectal cancer treated with extended resection: A case report. Asian J Surg. 2022;45(6): 1329-1330.
21. Wu X, Zhou S, Zhou X, Xu X, Wang L, Ruan Y et al. Literature review of imaging, pathological diagnosis, and outcomes of metachronous lung and pancreatic metastasis of cecal cancer. World J Surg Oncol. 2022;20(1):341.
22. Shitani M, Ogino J, Akahonai M, Isosaka M, Ota S, Tayama Y et al. Use of endoscopic ultrasound-guided fine needle aspiration of the pancreas to diagnose a case of primary linitis plastica of the colon with retroperitoneal dissemination. DEN Open. 2022;2(1):e12.
23. Yang J, Tang YC, Yin N, Liu W, Cao ZF, Li X et al. Metachronous pulmonary and pancreatic metastases arising from sigmoid colon cancer: A case report. World J Clin Cases. 2021;9(15):3668-3674.
24. Hirano M, Komatsu H, Aomatsu M, Tsuji Y, Takeuchi T, Yokono Y et al. [A Case of Metastasis to the Pancreas from Colorectal Cancer Which Was Difficult to Distinguish from Primary Pancreatic Cancer]. Gan To Kagaku Ryoho. 2021; 48(13):1789-1791.
25. Yagi Y, Kobayashi T, Watanabe T, Tanaka K, Hashidate H. [A Case of 11-Year Patient Survival after the Resection of a Metastatic Pancreatic Tumor of Sigmoid Colon Cancer]. Gan To Kagaku Ryoho. 2020;47(5):847-850.
26. Numata K, Urata N, Nakayama Y, Ono Y, Ju M, Onuma S et al. Resected Metachronous Pancreatic Metastasis from Rectal Cancer-A Case Report. Gan To Kagaku Ryoho. 2020;47(13):1930-1932.
27. Kurihara S, Nakazawa K, Miyamoto H, Okada T, Nobori C, Wang E et al. A Case of Metachronous Metastasis to the Pancreas from Ascending Colon Cancer after Subtotal Stomach-Preserving Pancreaticoduodenectomy (SSPPD). Gan To Kagaku Ryoho. 2019;46(1):136-138.
28. Machida T, Nishimura M, Yamada H, Oka Y, Nakadai E, Suda R et al. A Case of Pancreatic Metastasis from Colon Cancer Successfully Treated with Capecitabine /Oxaliplatin plus Bevacizumab. Gan To Kagaku Ryoho. 2019; 46(4):793-795.
29. Saito M, Teranishi F, Shibata T, Katada T, Shibata T, Aoyama Y et al. A Case of Resected Pancreatic Metastasis of Rectal Cancer after Multiple Resections of Metastatic Lesions. Gan To Kagaku Ryoho. 2019;46(2):327-329.
30. Olesinski T, Milewska J, Symonides M, Palucki J, Mroz A, Rutkowski A. Pancreatic Metastases of Rectal Cancer-Case Report and Literature Review. J Gastrointest Cancer. 2019;50(2):338-341.
31. Tani R, Hori T, Yamada M, Yamamoto H, Harada H, Yamamoto M et al. Metachronous Pancreatic Metastasis from Rectal Cancer that Masqueraded as a Primary Pancreatic Cancer: A Rare and Difficult-to-Diagnose Metastatic Tumor in the Pancreas. Am J Case Rep. 2019;20:1781-1787.
32. Sakai K, Ohashi T, Shimura Y, Teranishi R, Hara S, Takayama K et al. A Case of Resected Metachronous Pancreatic Metastasis from Rectal Carcinoma. Gan To Kagaku Ryoho. 2019;46(13):2306-2308.
33. Kato A, Naitoh I, Kato H, Hayashi K, Miyabe K, Yoshida M et al. Case of pancreatic metastasis from colon cancer in which cell block using the Trefle((R)) endoscopic scraper enables differential diagnosis from pancreatic cancer. World J Gastrointest Oncol. 2018;10(3):91-95.
34. Hino H, Kagawa H, Kinugasa Y, Shiomi A, Yamaguchi T, Yamakawa Y et al. Long-term survival with surgery for metachronous retroperitoneal lymph node and pancreatic metastases after curative resection of rectal cancer: a case report. Surg Case Rep. 2016;2(1):49.
35. Tokuyama S, Yoshioka S, Fukunaga M, Honda S, Yukimoto R, Okamoto A et al. A Case of Long-Term Survival of Resected Pancreatic Metastasis from Colon Cancer. Gan To Kagaku Ryoho. 2016;43(12):2459-2461.
36. Su L, Wernberg J. Synchronous distal pancreatic metastatic lesion arising from colonic adenocarcinoma: case report and literature review. Clin Med Res. 2014; 12(3-4):166-170.
37. Li DG, Giarrizzo A, Bellavia N, Milazzotto R, Frattalone ME, Scilletta B et al. Synchronous double cancers of the colon and the pancreas: a case report. Eur Rev Med Pharmacol Sci. 2014;18(2 Suppl):28-31.
38. Tamagawa H, Miyagi Y, Numata M, Yamamoto N, Shiozawa M, Morinaga S et al. Comparison of the chemosensitivity of the primary lesion and a pancreatic metastasis of colon cancer: a case report. Anticancer Res. 2012;32(4): 1457-1461.
39. Stoltz A, Barnoud R, Plok V, Ducerf C, Baulieux J, Mabrut JY. A pancreatic metastasis from a colon cancer. Clin Res Hepatol Gastroenterol. 2011;35(8-9): 586-589.
40. Lasithiotakis K, Petrakis I, Georgiadis G, Paraskakis S, Chalkiadakis G, Chrysos E. Pancreatic resection for metastasis to the pancreas from colon and lung cancer, and osteosarcoma. JOP. 2010;11(6):593-596.
41. Gravalos C, Garcia-Sanchez L, Hernandez M, Holgado E, Alvarez N, Garcia-Escobar I et al. Surgical resection of a solitary pancreatic metastasis from colorectal cancer: a new step to a cure? Clin Colorectal Cancer. 2008; 7(6):398-401.
42. Baierlein SA, Wistop A, Looser C, Bussmann C, von FM, Peterli R. Primary pancreatic neoplasia or metastasis from colon carcinoma? Acta Gastroenterol

Belg. 2008; 71(4):401-408.
43. Shimoda M, Kubota K, Kita J, Katoh M, Iwasaki Y. Is a patient with metastatic pancreatic tumor from rectal cancer a candidate for resection? Hepatogastroenterology. 2007;54(76):1262-1265.
44. Eidt S, Jergas M, Schmidt R, Siedek M. Metastasis to the pancreas - an indication for pancreatic resection? Langenbecks Arch Surg. 2007;392(5): 539-542.
45. Matsubara N, Baba H, Okamoto A, Kurata M, Tsuruta K, Funata N et al. Rectal cancer metastasis to the head of the pancreas treated with pancreaticoduodenectomy. J Hepatobiliary Pancreat Surg. 2007;14(6):590-594.
46. Crippa S, Angelini C, Mussi C, Bonardi C, Romano F, Sartori P et al. Surgical treatment of metastatic tumors to the pancreas: a single center experience and review of the literature. World J Surg. 2006;30(8):1536-1542.
47. Torres-Villalobos G, Podgaetz E, Anthon FJ, Remes-Troche JM, Robles-Diaz G, Nunez CC. Single pancreatic metastasis from a previously resected carcinoma of the cecum: a case report. Curr Surg. 2004;61(3):328-330.
48. Tutton MG, George M, Hill ME, Abulafi AM. Solitary pancreatic metastasis from a primary colonic tumor detected by PET scan: report of a case. Dis Colon Rectum. 2001;44(2):288-290.
49. Pereira-Lima JC, Coral GP, Bayer LR, da Silva CP. Metastasis from colon carcinoma in the dorsal pancreas of a patient with pancreas divisum: report of a case. Hepatogastroenterology. 2000;47(32):554-555.
50. Le Borgne J, Partensky C, Glemain P, Dupas B, de KB. Pancreaticoduodenectomy for metastatic ampullary and pancreatic tumors. Hepatogastroenterology. 2000; 47(32):540-544.
51. Harrison LE, Merchant N, Cohen AM, Brennan MF. Pancreaticoduodenectomy for nonperiampullary primary tumors. Am J Surg. 1997; 174(4):393-395.
52. Nakeeb A, Lillemoe KD, Cameron JL. The role of pancreaticoduodenectomy for locally recurrent or metastatic carcinoma to the periampullary region. J Am Coll Surg. 1995;180(2):188-192.