

The Survival Benefit of Repetitive Ultrasound-Guided Liver Resections in the Absence of Chemotherapy for Multiple Colorectal Recurrent Liver Metastases

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Abbreviations:
CRC: colorectal cancer;
LM - liver metastasis
POD - postoperative day
ADK - adenocarcinoma

Rezumat

Beneficiul adus în supravieţuire de rezecţia hepatică ecoghidată repetată în absenţa chimioterapiei pentru metastaze hepatice recurente de origine colorectală

Prezentăm cazul unei paciente de sex feminin, în vârstă de 54 de ani, diagnosticată cu neoplasm rectal stadiul IV, cu multiple metastaze hepatice sincrone (12), cea mai mare având 10 cm în diametru, distribuite bilobar. Managementul operator a constatat într-o rezecţie simultană rectală anterioară ultra-joasă efectuată prin abord robotic, cu anastomoză coloanală (protejată prin ileostomie) şi rezecţii hepatice ecoghidate non-anatomice multiple (efectuate prin abord deschis). Pacienta nu a putut urma chimioterapie neoadjuvantă şi adjuvantă din cauza efectelor secundare sistemice. Boala intra-hepatică a prezentat 2 episoade de recidivă, sancţionate prin rezecţii hepatice non-anatomice ghidate ecografic de tip „parenchima sparring”. În total 32 de metastaze hepatice au fost tratate (31 rezecate şi 1 ablată prin radiofrecvenţă). Pacienta a prezentat 1 episod de recidivă cu localizare pulmonară, sancţionată printr-o lobectomie superioară dreaptă cu limfadenectomie, pentru o metastază singulară. Pacienta a decedat pe seama progresiei bolii atât intra-, cât şi extrahepatic la 34 de luni după prima intervenţie chirurgicală.

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Cuvinte cheie: neoplasm colorectal, metastaze hepatice, rezecție hepatică, supraviețuire globală

Abstract

We present the case of a 54-year-old female patient, diagnosed with stage IV rectal cancer, with multiple (12) synchronous liver metastases, the largest of 10 cm in diameter, bilobar distributed. The operative management consisted in simultaneous ultra-low robotic anterior resection with coloanal anastomosis (protected by ileostomy) and multiple ultrasound-guided non-anatomical liver resections (in open approach). The patient was unable to follow neoadjuvant and adjuvant chemotherapy due to the systemic side effects. The intrahepatic disease presented 2 episodes of recurrence, sanctioned by ultrasound-guided non-anatomical parenchyma sparing liver resections. In total 32 liver metastases were addressed (31 resected and 1 radiofrequency ablated). The patient presented 1 episode of lung recurrence, sanctioned by right superior lobectomy and lymphadenectomy for a singular metastasis. The patient died with disease progression both intra-, and extrahepatically after 34 months post first surgical intervention.

Key words: colorectal cancer, liver metastases, liver resection, overall survival

Introduction

Colorectal cancer (CRC) is known worldwide as the third cause of cancer-related death (1). Recent literature data shows that 15-25% of CRC patients present with synchronous liver metastases. In addition, 20-30% are subjected to developing meta-chronous liver metastases over the next months (2). Currently, literature reports that liver resection is associated with a 5-year overall survival of 58%, and disease recurrence occurring in up to 66% of cases (3,4). The current case presentation is aimed to present the complex surgical management of such a challenging disease.

Case Presentation

We present the case of a 54-year-old female patient, diagnosed with stage IV rectal cancer, with multiple (12) synchronous liver metastases, the largest of 10 cm in diameter, bilobar distributed (*Figs. 1-3*). The case was discussed in a multidisciplinary setting and a simultaneous approach after neoadjuvant

chemotherapy was recommended. The chemotherapy was suspended due to digestive intolerance and leukopenia. The operative management consisted in ultra-low robotic rectal anterior resection with coloanal anastomosis (protected by ileostomy), and multiple ultrasound-guided non-anatomical liver resections (conducted in open approach) (*Figs. 4-5*). The patient was unable to follow subsequent chemotherapy due to the systemic side effects. The intrahepatic disease presented two episodes of liver recurrence, sanctioned by ultrasound-guided non-anatomical parenchyma sparing liver resections. In total 32 liver metastases were addressed (31 resected and one radiofrequency ablated) (*Figs. 6-10*). The patient presented one episode of lung recurrence, sanctioned by right superior lobectomy and lymphadenectomy for a singular metastasis. Eventually, faced with the impossibility of administering any form of chemotherapy the disease progressed both intra-, and extra-hepatically. The recorded overall survival was 34 months.

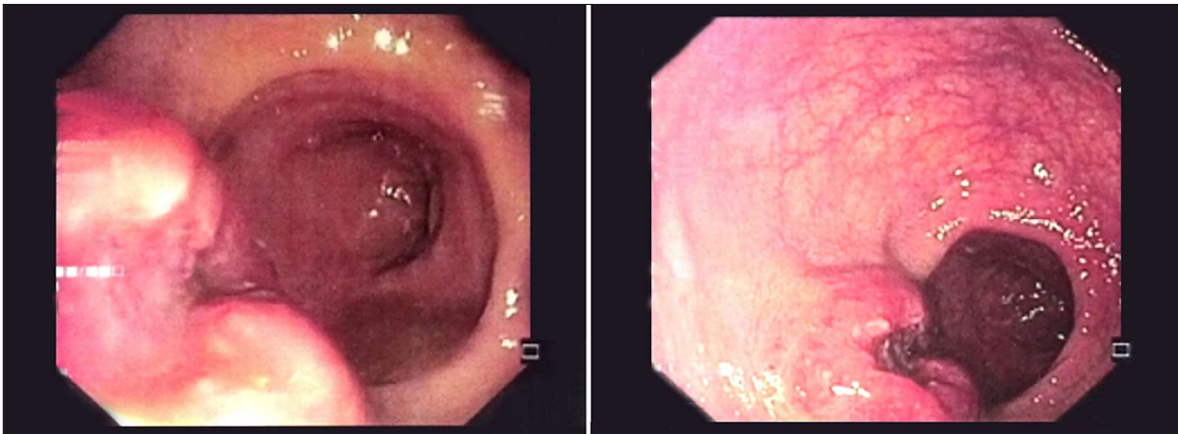


Figure 1. The colonoscopy exam revealed a very low rectal non-stenosing bleeding tumor, located at 3 cm from the anal orifice, 2.5 cm in size - moderately differentiated adenocarcinoma upon biopsy. CEA value: 142.8 ng/mL, while CA19.9: 1459 U/ml.

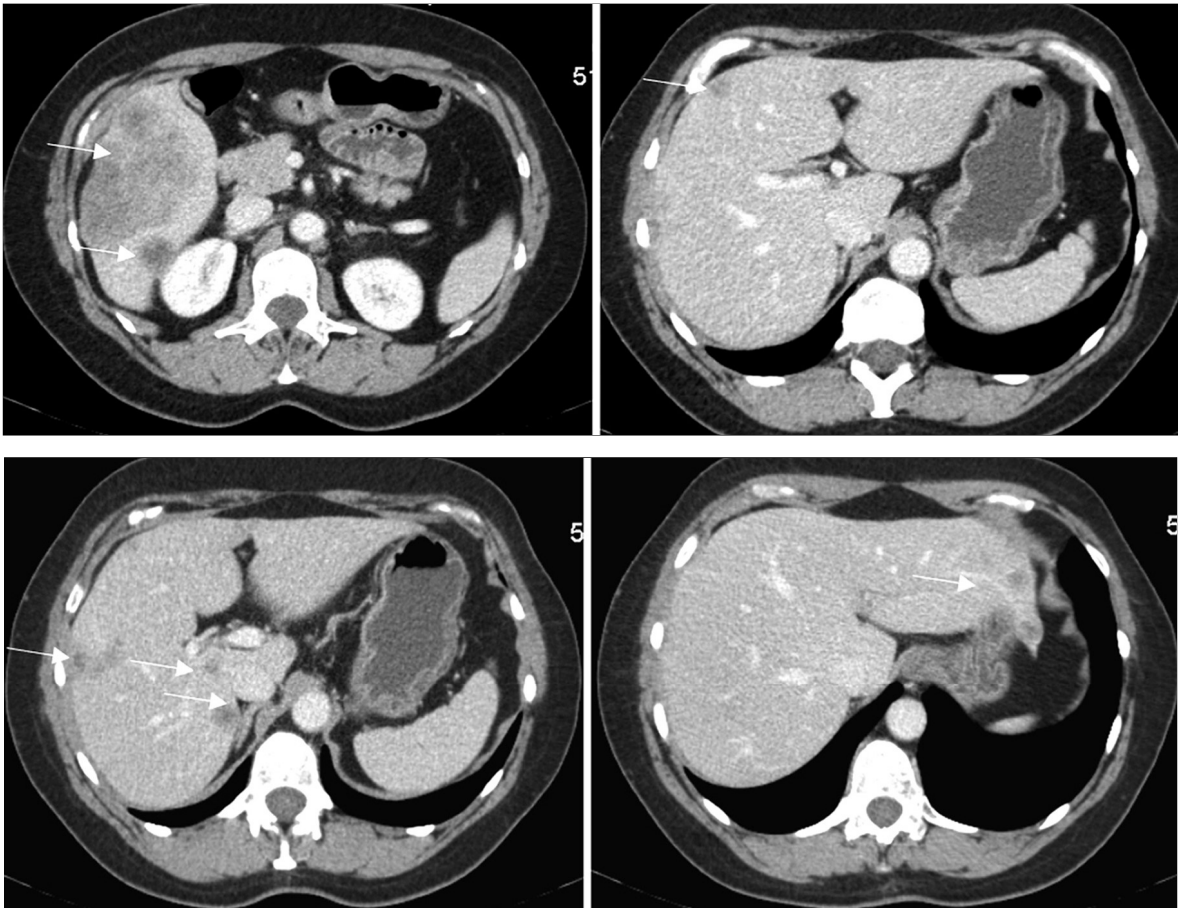


Figure 2. Contrast-enhanced CT exam shows multiple (9) synchronous liver metastases, the largest of 10 cm in diameter, bilobar distributed, located in S1 (1 LM), S2(2 LM), S3(1 LM), S5(1 LM), S6(1 LM), S7(2 LM) and S8 (1 LM).

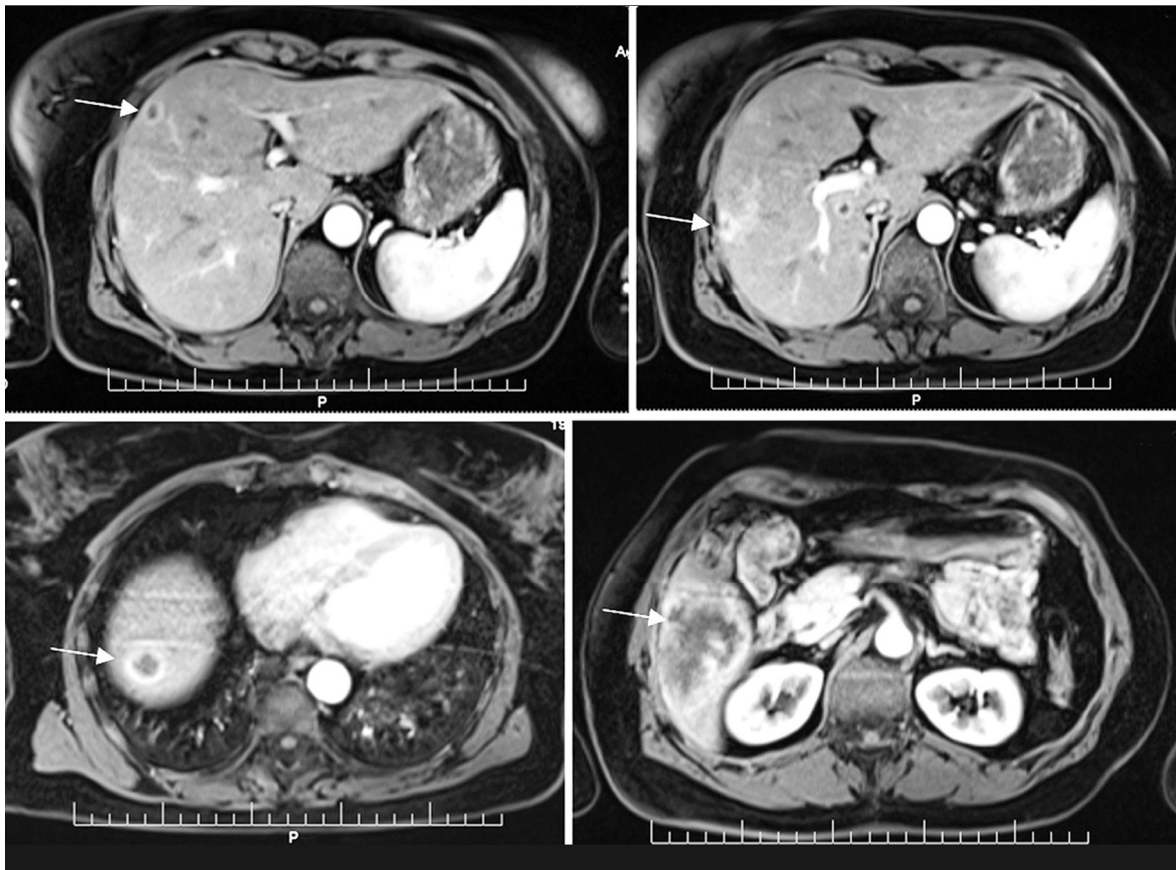


Figure 3. FOLFOX-4 chemotherapy was initiated as neoadjuvant chemotherapy, but was suspended after the 4th session due to digestive intolerance (diarrhea) and leukopenia. Contrast-enhanced MRI showed partial response according to the RECIST criteria (the largest metastasis was measuring 6.5cm in size at this point). CEA: 7.5 ng/mL and CA19.9: 101 U/ml.

Conclusion

The current case illustrates the advanced and aggressive stand-alone surgical management of multiple synchronous colorectal liver metastases, faced with the impossibility of proper chemotherapy. This led to satisfactory results comparable to multimodal therapy in terms of overall survival.

Conflicts of Interest

The authors declare no conflict of interest.

Institutional Review Board Statement

The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Institutional Ethics Committee of Fundeni Clinical Institute, Bucharest, Romania (protocol code 22694/20.04.2022).

Informed Consent Statement

Informed consent was obtained from the subject involved in this study.

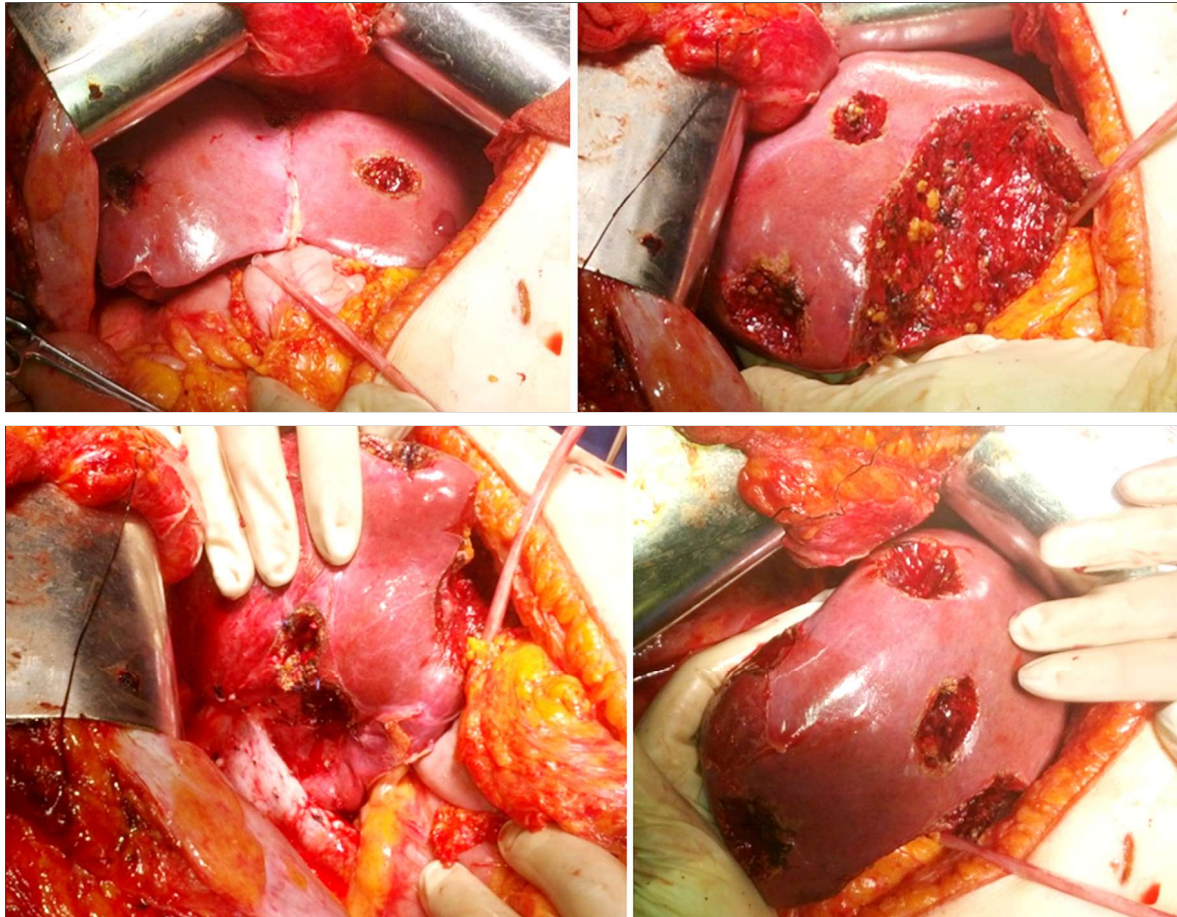


Figure 4. The rectal tumor started to bleed significantly, which led to subsequent anemia (Hb=10 g/dl); therefore, following multidisciplinary reassessment the therapeutic management was switched to a synchronous approach. 4 months after diagnosis we performed in the same surgical session an ultra-low robotic anterior resection with colo-anal anastomosis (protected by ileostomy), and multiple ultrasound-guided non-anatomical parenchyma sparing liver resections (in open approach) for 12 metastases involving all liver segments (3 newly found at IOUS: S1 (2 LM), S2(2 LM), S3(1 LM), S4(1 LM), S5(1 LM), S6(2 LM), S7(2 LM) and S8 (1 LM). The patient was discharged POD 10, after an uneventful postoperative course.

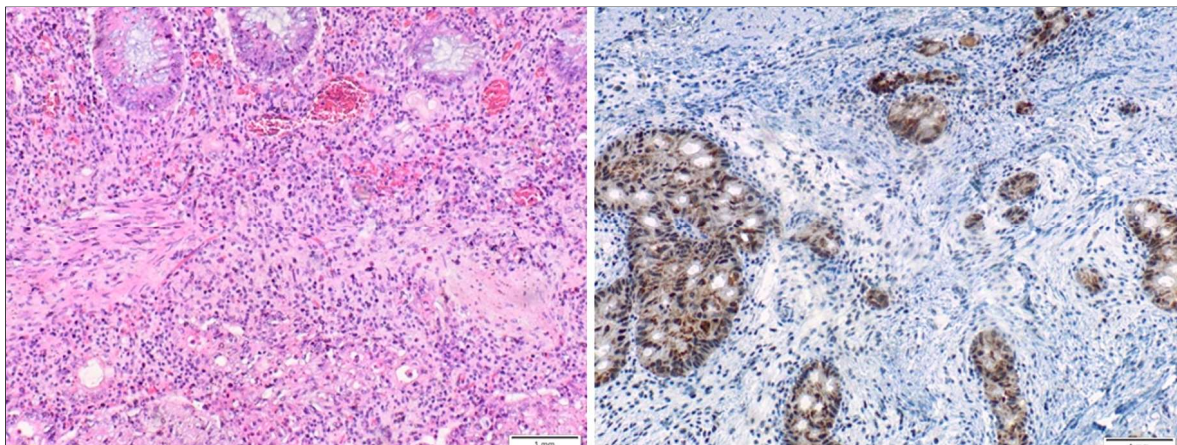


Figure 5. Histopathological exam showed a well/moderately differentiated ADK (G1/G2) invading the subserosa and tumoral lymph nodes (1 out of 10) (pT3 pN1 pM1hep), with negative resection margins of 15 mm, and 12 colonic type liver metastases; K-Ras wild type; presence of microsatellite instability high - MSI-H.

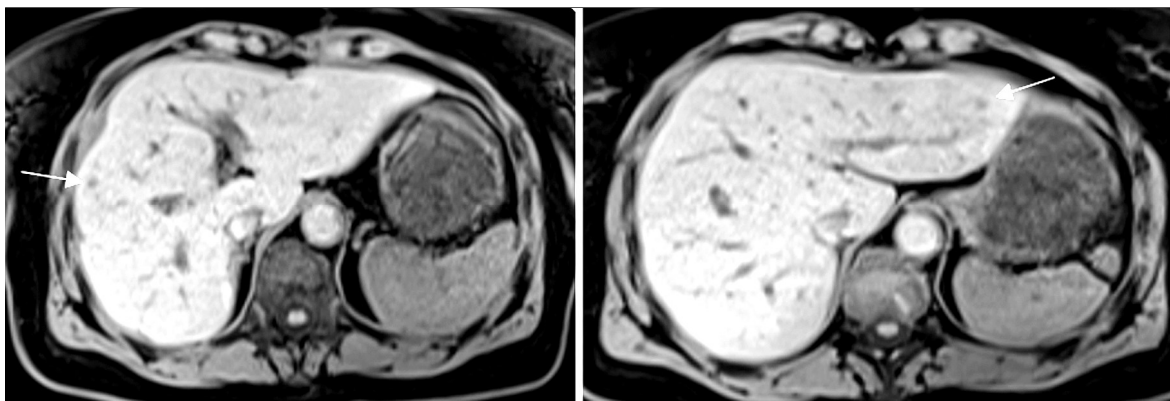


Figure 6. Soon after, the patient started adjuvant chemotherapy FOLFOX-4. Unfortunately, the therapy was suspended after only 2 cures, due to severe digestive intolerance and leucopenia. The oncological follow-up at 3 months after the surgery by MRI showed 3 new liver metastases (segments 2-3, 5 and 7), the largest (5 mm) located in segments 2-3. CEA and CA19-9 within normal range.

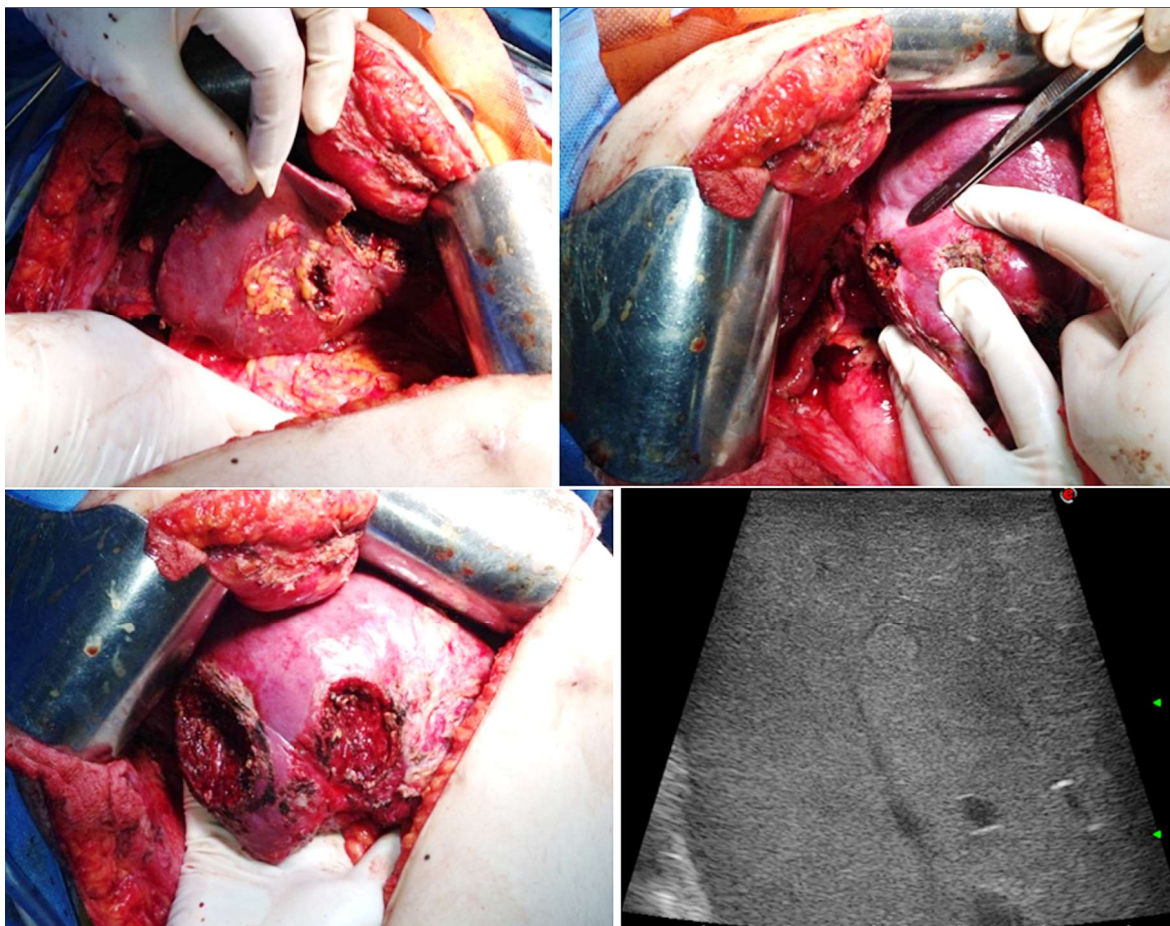


Figure 7. Following multidisciplinary debate, the patient underwent liver re-resection. We performed an ultrasound-guided non-anatomical parenchyma sparing liver resection of S2-3 (1 LM), S5 (1 LM), and S6 (1 LM), and wedge resections in S2 (2 LM), and S7 (1 LM); for a total 6 liver metastases (3 newly found upon intraoperative ultrasound). During the same operative procedure, the continuity of the digestive tract was re-established. The patient was discharged on POD 9, after an uneventful postoperative course.

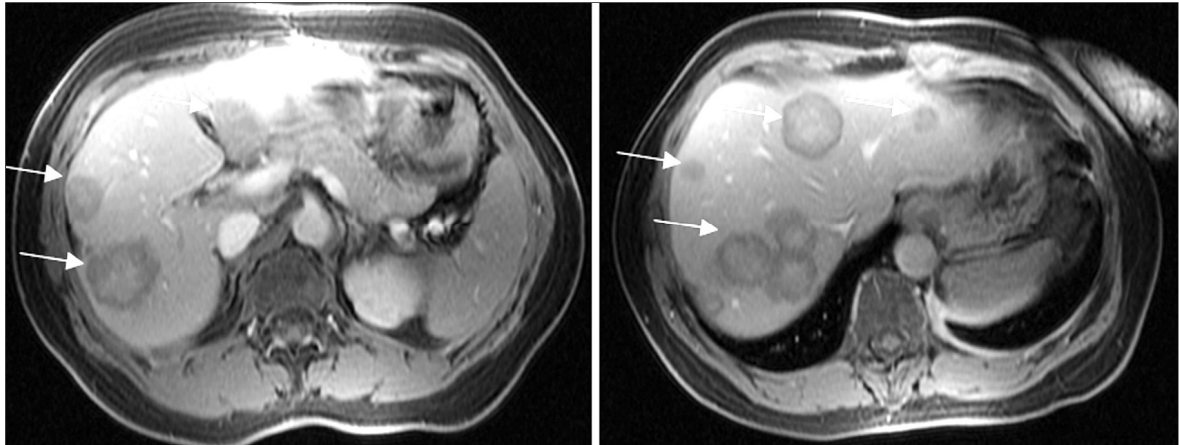


Figure 8. After the second resection, a new attempt to administer second line chemotherapy (XELIRI + Cetuximab) was made. This proved again unsuccessful, due to severe digestive intolerance; therefore, third line therapy was administered, consisting in 10 sessions of FOLFIRI + Bevacizumab. During the oncological follow-up (4 months after last surgery), contrast-enhanced MRI and PET revealed 14 new bilobar liver metastases (in segments 2, 3, 4, 5, 6, 7, and 8; the largest of 45 mm in diameter), and 1 lung metastasis (in the superior right lobe in contact with the pulmonary artery, 36/25 mm in size). 6 months after last liver surgery, the lung resection was performed (right superior lobectomy and hilar, interlobar, and mediastinal lymphadenectomy); histology revealed a well differentiated (G1) singular ADK metastasis, with macrovascular invasion, and no lymph node involvement.

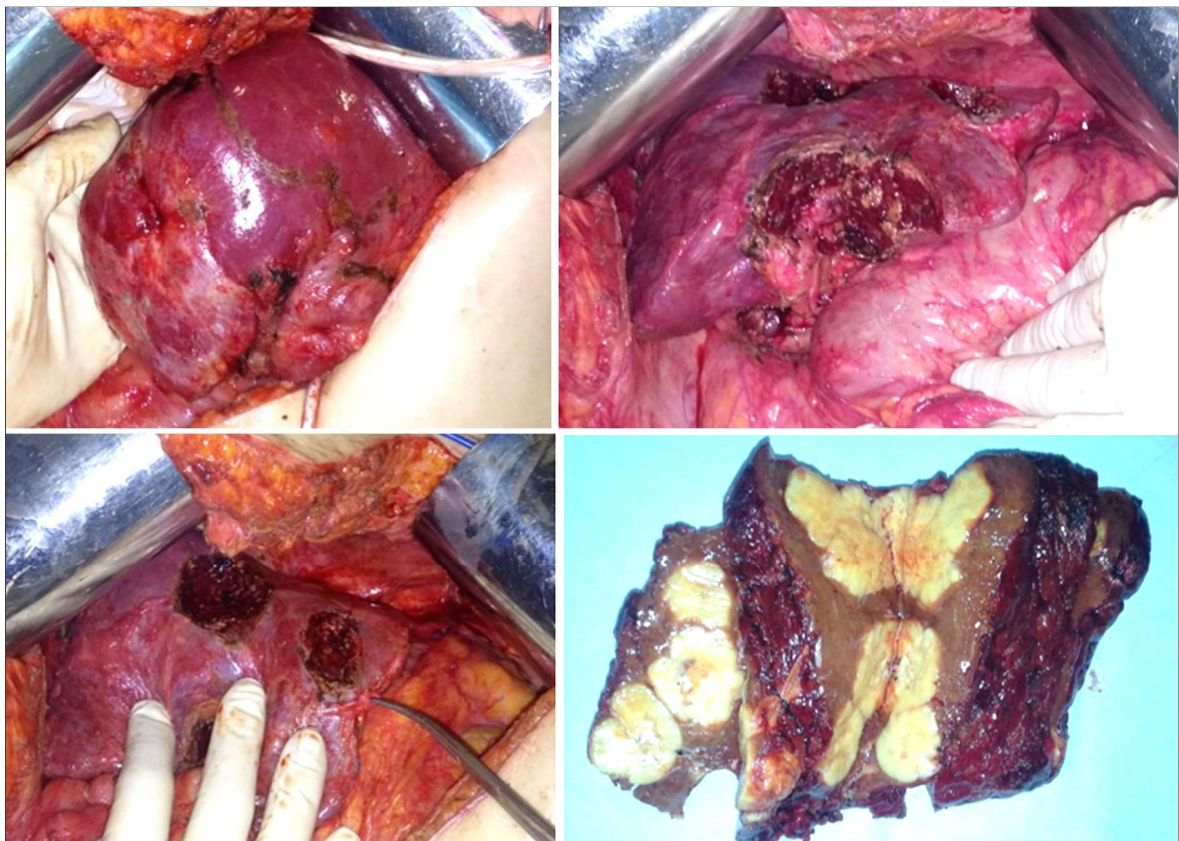


Figure 9. One month after the lung resection, we performed another liver re-resection, consisting in ultrasound-guided non-anatomical parenchyma sparing liver resections of segments 6-7 extended to segments 5 and 8 (9 LM) and segment 3 (1 LM), and wedge resections in segments 2 (1 LM), 4 (1 LM), 5 (1 LM), associated with intraoperative radiofrequency ablation in segment 8 (1 LM). The postoperative course was marked by a mild liver insufficiency (grade A), the patient was discharged on the POD 8.

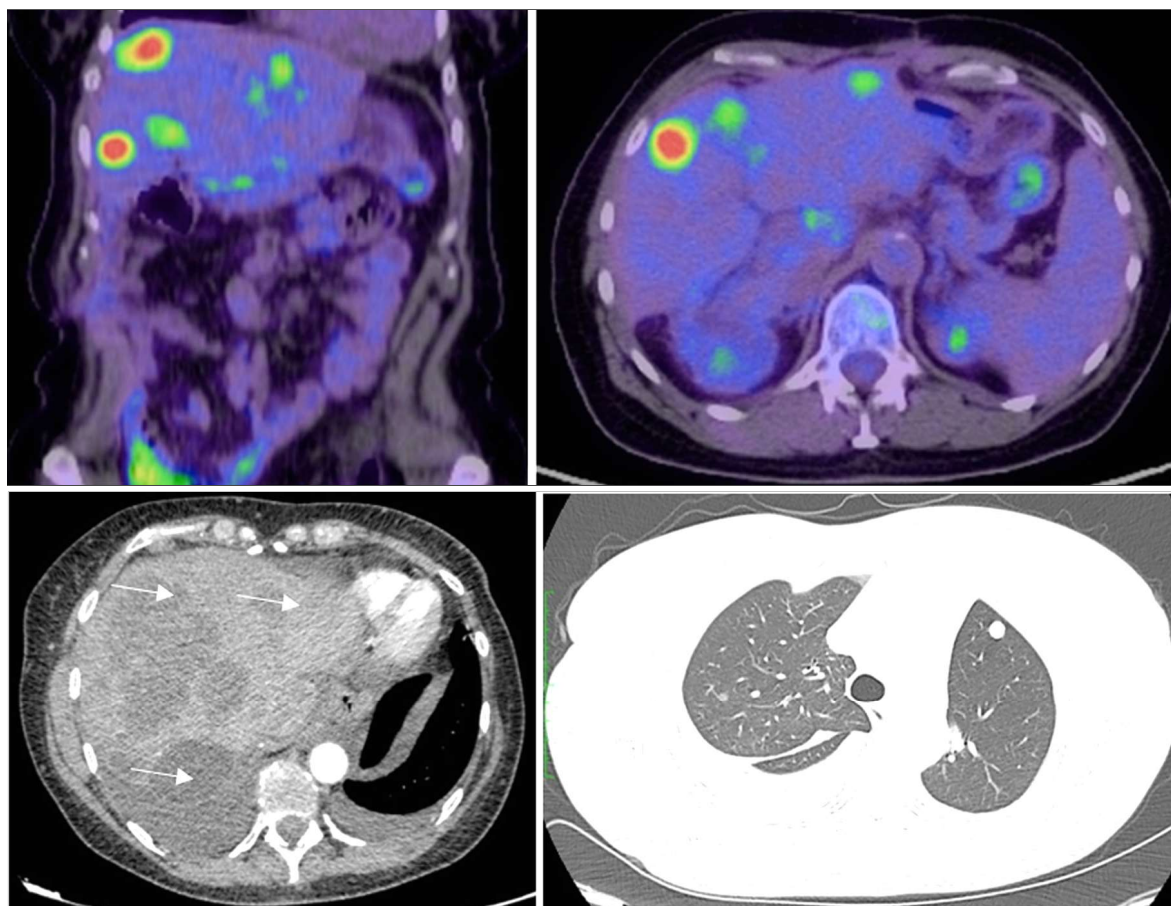


Figure 10. 5 months after the last liver resection, MRI exam reveals new liver metastases. Due to the great disease burden that led to insufficient post-resectional liver parenchyma, the metastases were considered unresectable. Therefore, transarterial chemoembolization (DEBIRI) was performed. The post interventional course is marked by mild hepatic insufficiency (grade A). During the next months, both the intrahepatic and extrahepatic disease progressed significantly: liver metastases involved almost the entire parenchyma, multiple bilateral lung metastases, and peritoneal carcinomatosis. The overall survival was 37 months.

Acknowledgments

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