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Extended Right Hepatectomy with Partial Vena Cava Resection and Primary Vascular Reconstruction using Venous-venous Bypass for a Single Giant Metastasis from Colorectal Cancer: Case Report and Review of the Literature

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ABSTRACT

Background: Hepatic Resection (HR) for Liver Metastasis from Colorectal Cancer (LMCRC) is considered golden standard treatment and additionally it is the single hope to attain a long-term survival in this scenario. Stated surgery or “Classical Approach”, that consist at first the resection of primary tumor followed chemotherapy and finally resection of liver metastasis has been performed with good results. Although in the past giant metastasis with major vascular involvement had been considered a relative contra-indication to the radical surgery, nowadays with improvement of surgical techniques associated a new chemotherapy schemes this scenario has changed.

Case report: Middle age male presented a single giant synchronous LMCR that involved vena cava. He underwent an emergency open right hemicolectomy due a haemorrhagic tumor (T3N0M1) and sequential chemotherapy with eight cycles of FOLFIRINOX regime. There was partial response and he finally underwent a successful extended right hepatectomy with partial vena cava resection and primary anastomosis. To date, fourth months after hepatic resection, he is alive without any recurrence.

Conclusion: Although vascular invasion, synchronicity, and diameter of LMCR can be considered bad prognostic factors to attain a long-term survival, a radical resection even with a major vascular resection with free margins should be tried whenever possible mainly when there is a single lesion that presented partial response to the initial systemic therapy. A long-term survival can be attained such as we have observed in this case report.

KEYWORDS

Colorectal cancer, Hepatic Neoplasms/surgery, Liver/surgery, Hepatectomy

INTRODUCTION

Hepatic Resection (HR) for Liver Metastasis from Colorectal Cancer (LMCRC) has been largely studied along last 30 years. The golden standard treatment to the LMCR has been the association of chemo-target therapy allied with HR. HR For patients with LMCR HR is the main curative choice. However, approximately 75% of patients experience recurrence after the first liver resection, and only 16% of patients remain disease-free for 10 years after hepatectomy. Thus, although very long-term survival or even the cure are rare, the single way to attain this objective is by means of the HR. Nonetheless on the recent past the overall 5-year survival was about 20-25% to the patients which underwent HR for LMCR treatment, currently this scenario is rapidly changing and nowadays these rates has increased ranging from 36 until 58% [1-4]. More advanced chemotherapeutic schemes or even the discovery of the target therapy with “biologics” implementation at therapeutic arsenal have contributed for this survival improvement [4].

Consequently, identifying efficient prognostic factors is very necessary to screen for high-risk subgroups and subsequently to optimize therapeutic interventions to achieve maximum therapeutic effectiveness. The best understanding of the prognostic factors is very important

to select the patients that will present good outcomes with surgical resection. Many prognostic factors have been studied in relation HR to the LMMCRC treatment. Among them, the most cited in the literature have been the following: number of metastasis, diameter, extra-hepatic disease, disease-free interval between primary treatment and LM diagnosis, seric level of CEA, presence of lymphonode metastasis, surgical margins, nutritional status, response to the chemotherapy treatment, and more recently biomarkers such as KRAS as BRAF mutations [1-8].

Vascular invasion of major vessels such as vena cava for example it was also considered a bad prognosis factor and a relative contra-indication to the HR on recent past. However, with refinement of the surgical techniques based in the liver transplantation and the best knowledge of ischemia-reperfusion effects allied to extensive use of vascular reconstruction, the resection of major vessels has been considered a no contra-indication to the HR for LMCRC treatment over the last years [10,11]. Small series and recently published meta-analysis have shown the real benefit of this exceptional conduct, therefore a long-term survival can be possible on this scenario when free margins are attained [10,11]. Although, the mortality of these ultra-radical procedures is relatively low in skilled hands, the overall morbidity is still high [11]. Present authors report a case of long-term survival (40 months) in a patient with giant single synchronous LMCRC who was successfully submitted an open extended right hepatectomy with partial resection of the vena cava.

CASE REPORT

A 50-year-old male was referred to our unit with a 2 months history of lower digestive haemorrhage. Physical examination revealed a 12 × 10 cm tumor in the right superior quadrant of the abdomen. An urgent colonoscopy showed an infiltrative and ulcerative lesion of hepatic flexure of the right colon. An abdominal CT revealed a 12 × 11.5 cm single metastasis that practically involved the right hepatic lobe and also presented a partial involvement of the Inferior Vena Cava (IVC). Preoperative CEA seric level was 28.9 ng/dl. He underwent an emergency open right hemicolectomy with primary anastomosis and good recovery without postoperative complications. A histological analysis revealed a moderate grade adenocarcinoma invading serosa without lymphonodal involvement (T3N0M1-UICC classification). He presented a mutated KRAS tumor.

Pet-scan confirmed a single hepatic metastasis (Right lobe).

So, he received systemic chemotherapy, the used scheme was fluoracil, oxalaplatin and irinotecam (FOLFOXIRI). He received eight cycles with partial response of the hepatic metastasis (Figure 1: Abdominal CT) and also a decreased of him seric level of the CEA (28.09 ng/dl). Nevertheless, the LMCRC had decreased on its diameter (9.5 × 8.5 cm), it still comprised the IVC. This way, we proposed an open extended right hepatectomy with partial resection of IVC (Figures 2 and 3) and primary reconstruction. This procedure underwent with total vascular exclusion of the liver with venous-venous shunt and extracorporeal circulation. This patient presented a severe bleeding of the bed liver that was related to important thrombocytopenia by the use of heart-lung machine. Due to the difficulty in performing hemostasis, it was necessary to package the liver with a new reoperation in 72 hours. After this second procedure he presented good evolution and was discharged on the 10th postoperative day without any complications.

Pathological evaluation showed invasion of vascular tissue of the vena cava, the surgical margins were free of the neoplasm involvement. Subsequently, he received four more cycles of the same initial scheme.

To date, fourth months after hepatic resection, he is alive without any recurrence (Figure 4: CT of the abdomen). Currently, he also presents an excellent quality of life without the use of any chemotherapeutic.

DISCUSSION

CRC is a very common malignancy, ranking in the top three most commonly diagnosed cancers around the world [1]. It has been estimated that unless 50% of CRC patients present liver metastasis during their disease course [2,3]. Among those patients, 20-35% of patients with metastatic disease present metastasis confined only at liver, consequently hr is the best therapeutic option aiming long term survival. Once HR is completed with removal of all metastases, the long-term survival is allowed, which ranges from 36 to 58% at 5 years and from 23 to 36% at 10 years [2,3]. Along with the CRC is very frequent malignant neoplasm around the world, it is estimated that there have been about 57000 new cases per year of this disease in our country at 2014.

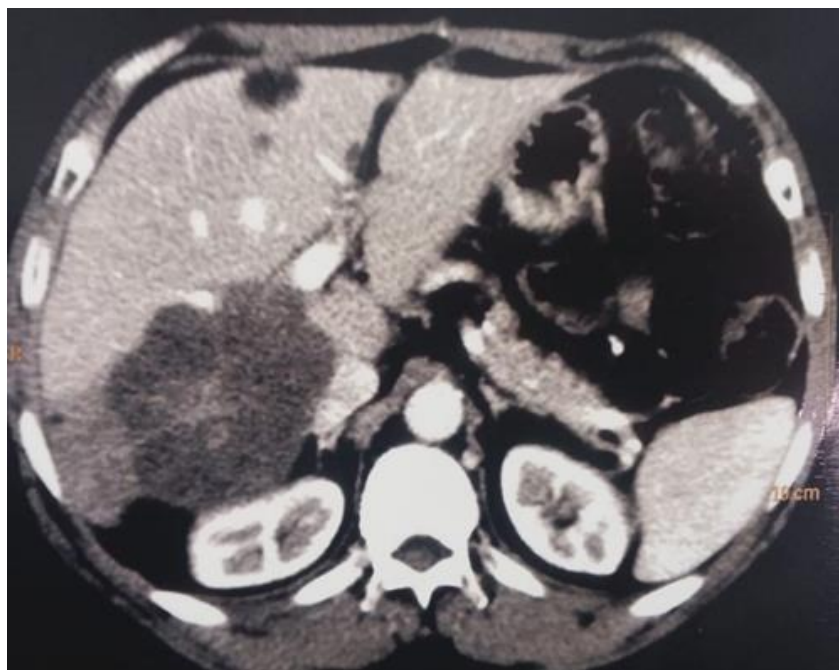
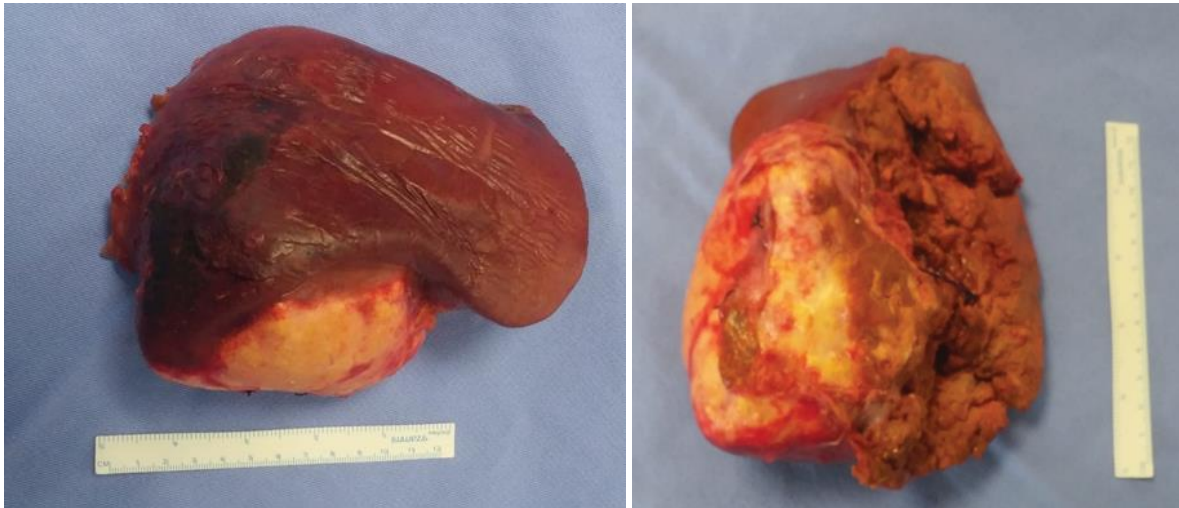


Figure 1: Preoperative abdominal CT: Single giant CRCLM in right lobe with partial involvement of the VCI



Figures 2 and 3: Surgical specie-Right Lobe (Extended Right hepatectomy)



Figure 4: Abdominal CT-Fourty months after hepatic resection

Since CRC is usually very sensitive neoplasm to both chemotherapy and target therapy, the resection of LMCR after systemic treatment seems to present an important role in improvement of the overall survival [4-7]. Once LMCR are considered unresectable or even borderline resectable, the preoperative treatment aiming downsizing of the LMCR becoming them in some cases resectable, so when this objective is attained this approach has been designed such as conversion chemotherapy [12]. This aggressive approach can lead an increasing of the resectability mainly in cases like this reported and the long-term survival can be similar those patients which

underwent no conversion therapy [12]. In this present case, we could observe that initial therapy was very important because decreased both the lesion size and seric tumor markers though its resectability had remained borderline.

Many studies has been performed to evaluate a better knowledge of the Prognostic Factors (PG) in LMCR. The more important PG for LMCR that have been described in the literature are: Both number and diameter of lesions, extra-hepatic disease, disease-free survival time between primary lesion treatment and development of liver metastasis, seric levels of both CEA and Ca 19.9, response to the

systemic therapy, surgical margins, macro-microscopic vascular or lymphatic invasion, and more recently biomarkers such K-RAS or BRAF mutations [1-9]. These PG have been shown as significant to attain a long-term survival [1-9].

Currently, with improvement of techniques to perform complex hepatectomies with vascular resections and a decrease of the overall mortality mainly associated with a great expertise that was acquired with liver transplantation, those cases which in the past were considered unresectable, lately have transformed in resectable cases [10,11]. Although, this patient presented four bad prognostic factors such as giant metastasis (More than 5 cm), synchronicity, and vascular invasion like observed in previous studies [1-10]; we have observed a long-term survival. Despite a vascular involvement seems offer an overall bad prognosis, when the margins are free a long-term survival can be attained such as also observed previously by *Zhou et al.* [10]. Previously, we have reported similar case of a giant single CRC metastasis that involved IVC, at this time a partially resection of the IVC with primary reconstruction was necessary aiming to attain free margins and this patient also attained a long-term survival [11]. Besides that, in our opinion like others experts have reported, both partial clinical response after initial chemotherapy and low seric level of the CEA could also have contributed to the long-term survival of the present case.

In some, although a patient can present bad prognostic factors as we observed in this case, all efforts should be tried to attain free margins even when a major vascular resection is necessary because a long-term survival can be observed mainly in patient who responded a initial chemo-target therapy.

CONCLUSION

Although vascular invasion, synchronicity, and diameter of LMCRC can be considered bad prognostic factors to attain a long-term survival, a radical hepatectomy even with a major vascular resection with free margins should be tried whenever possible mainly when there is a single lesion that presented partial response to the initial systemic therapy. A long-term survival can be attained such as we have observed in this case report.

CONFLICTS OF INTEREST

None.

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