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Liver Angiosarcoma: Rare tumour associated with a poor prognosis, literature review and case report

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ABSTRACT

INTRODUCTION: Liver angiosarcoma is a very uncommon tumour of mesenchymal origin, representing between 0.1–2% of all primary tumours of the liver, affecting mainly men in their sixth or seventh decade of life, with a high mortality in the first years (Chaudhary et al., 2015). Literature reports of its surgical treatment vary from a total or partial hepatectomy with or without liver transplant.
PRESENTATION OF CASE: A 37 year old male, with a 7 year history of a fatty liver, was found to have a 12 cm diameter tumour in a cirrhotic liver, during an abdominal Computed Tomography (CT) scan. Patient was asymptomatic with negative tumour markers, yet tumour liver biopsy revealed a Liver Angiosarcoma with positive immunohistochemistry for neoplastic cells CD31 and CD34.

Patient was deemed candidate for a partial hepatectomy of the affected liver segments which was done without complications and no evidence of other tumour lesions was found during surgery. Patient continued oncologic management with ongoing chemotherapy.
DISCUSION: Liver Angiosarcoma, although rare, persists with a high mortality due to its aggressive nature. Never the less liver transplantation, although proven to be an effective treatment for many pathologies that culminate in liver failure, fails to improve patients' survival and prognosis, when compared to partial hepatectomy as surgical management to for liver Angiosarcoma,
CONCLUSION: Partial hepatectomy as surgical management, followed by adjuvant therapy, for Liver Angiosarcoma continues to prove favourable results and prognosis compared to Liver Transplantation.

1. Introduction

Primary tumours of the liver are divided into two groups: epithelial and non-epithelial. Tumours of epithelial origin include hepatocellular carcinoma, cholangiocarcinoma, hepatoblastoma and fibrolamellar hepatocellular carcinoma variant. Tumours of non-epithelial origin include the hepatic angiosarcoma, rhabdomyosarcoma, hemangioendothelioma and lymphoma [2]. The hepatic angiosarcoma is a tumour of mesenchymal origin, representing 0.1–2% of all primary tumours of the liver and generally appearing during the sixth or seventh decade of life [1]. Given the infrequent nature of this pathology, we decided to publish this case report with emphasis on a review of the literature and the surgical management of the tumour.

2. Presentation of case

Male patient, 37 years old, with a 7-year history of a fatty liver who during a CT scan, was found to have a 12 cm mass in segment II and III of the liver (Figs. 1–3) and two satellites in the right lobe, of 1 cm and 2 mm in segment VII and V respectively, associated with a cirrhotic liver (Child-Pugh A).

The patient was asymptomatic with negative tumour markers and an alpha-fetoprotein of 1.7 mg/dL. He was therefore referred to our institution for possible surgical and medical management, with the possibility of a liver transplantation (LT). The Hepatobiliary Surgery Group and the Transplantation Surgery Group evaluated

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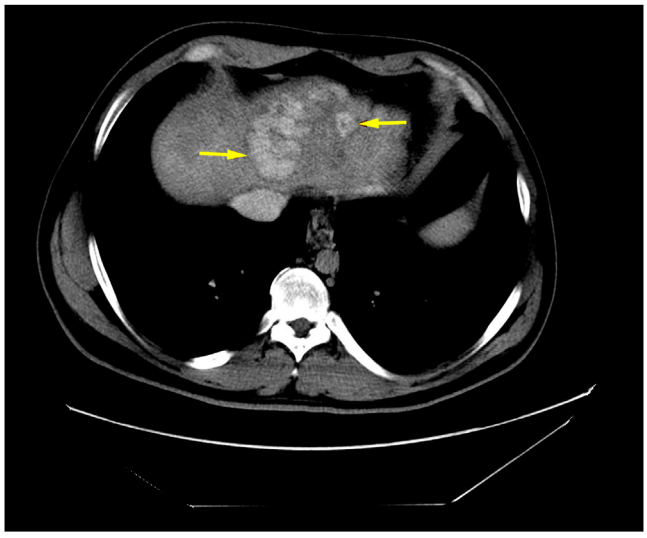

Fig. 1. Axial views of a contrast enhanced CT scan of the liver revealing a large heterogenous tumour in the second and third segment of the liver, as signaled by the red arrows.

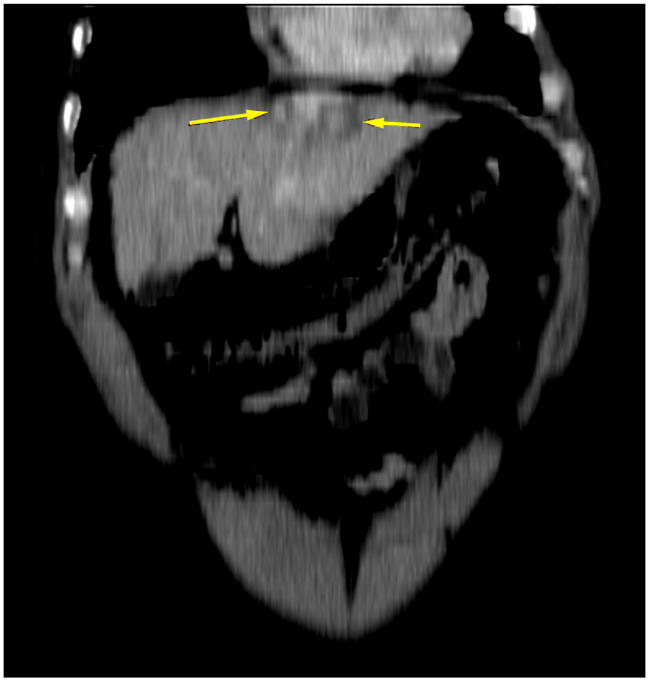

Fig. 2. Coronal views of a contrast enhanced CT scan of the liver revealing a large tumour in the second and third segment of the liver.

the patient in November 2015 during which a liver biopsy, guided by laparoscopy, was carried out.

During the surgery, a cirrhotic liver was observed with a hypervascular mass in segments II and III of the left lobe. The liver biopsy was taken using Trucut, with no complications, and the final report showed a liver angiosarcoma with immuno-histochemistry positive for neoplastic cells CD31, CD34 and with p53-Vimentin greater than 90% and an index of cell proliferation (DAO) with Ki67 of 50% (Fig. 4).

It was decided, by the Board of Transplantation Surgery, Hepatology and Oncology, that the patient was a candidate for a left hepatectomy and later adjuvant medical treatment with radiofrequency and chemotherapy for the management of the satellite lesions.

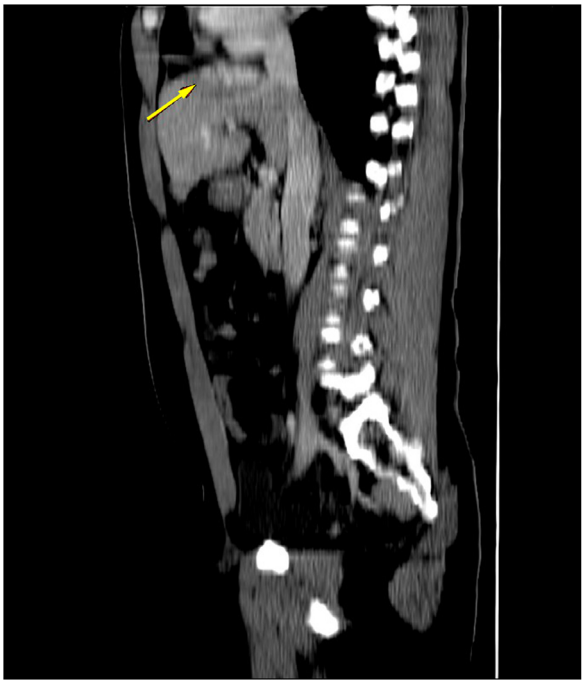

Fig. 3. Sagital views of a contrast enhanced CT scan of the liver revealing a large tumour in the second and third segment of the liver.

The patient was taken to open surgery where a cirrhotic, micronodular liver was found, without ascites, with a vascular type tumour that occupied segments II, III and IV of the liver (Fig. 5). No tumour lesions were found on the right side, neither peritoneal planting, nor in the rest of the abdominal cavity. A left Hepatectomy was performed with cholecystectomy, with no complications, and the patient was moved to the intensive care unit for post-surgery medical management, where they remained for one week.

During his clinical evolution, the patient presented with hyperbilirubinemia, raised transaminase and ascites, which were medically managed without the patient presenting any clinical signs of post-surgery acute liver failure.

The patient had no inflammatory response, tolerated oral medication and experienced decreasing ascites and liver enzymes. He was discharged after two weeks of hospitalisation upon a normal physical examination. Laboratory controls, via outpatient consultations, were normal.

Three weeks after his discharge, the patient showed evidence of a satisfactory clinical evolution, being asymptomatic with a normal physical examination: Heart Rate = 82/min, Blood Pressure = 110/70 without ascites, without jaundice, Aspartate Aminotransferase = 25, Alanine Aminotransferase = 28, alkaline phosphatase 189 and Gamma-Glutamyl Transpeptidase = 227.

8 month after the surgery the patient continues receiving adyuvant chemotherapy with favourable results.

3. Discussion

Liver Angiosarcoma may manifest as a single mass with satellite nodules or as a diffuse infiltrative mass throughout the liver tissue due to the atypical proliferation of endothelial cells in the hepatic sinusoids [3]. Creating a high mortality rate due to haemorrhages (secondary to tumour rupture) or acute liver failure with a 2 years survival rate of 3% [4]. Seventy five percent of the cases are of unknown aetiology [5], however, several risk factors have been accused, such as exposure to vinyl chloride, chronic intake of

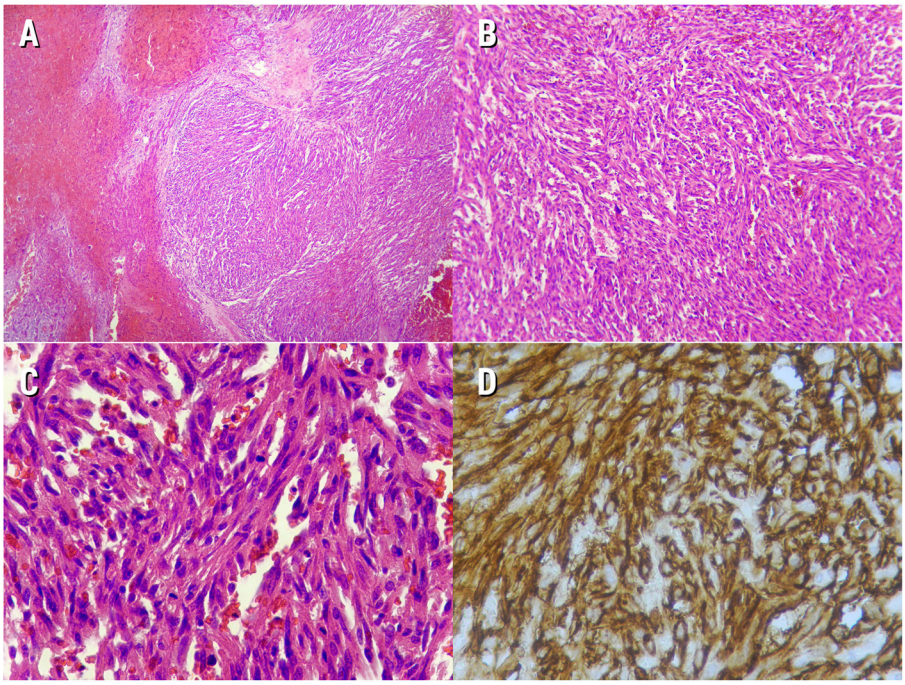

Fig. 4. Panel A (40× H&E Stain), B (100× H&E Stain) and C (400× H&E Stain) shows a lesion composed of fusiform cells with pleomorphic nuclei lining the sinusoids and alternating with areas of hemorrhage and necrosis. Panel D (400× CD31) shows Immunohistochemistry showing neoplastic cells positive to monoclonal antibody CD31.

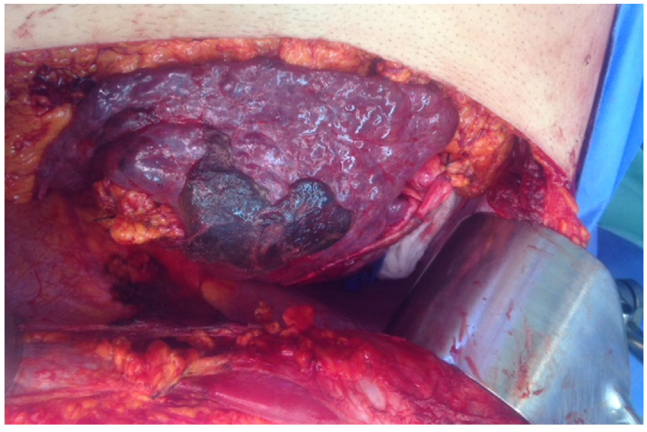

Fig. 5. Left lobe showing the cirrhotic tumour mass in Segments II and II.

arsenic, anabolic steroids, androgens, cyclophosphamide and the use of oral contraceptives [6,7].

The majority of patients present with non-specific symptoms but usually start with pain in the right hypochondrium, ascites and hepatomegaly. As shown in our case report, up to 12.5% of cases are found in asymptomatic patients, with the tumour in the liver parenchyma usually being found incidentally and then liver angiosarcoma being confirmed via histological findings in a liver biopsy [1,8].

LT has become the gold standard therapeutic modality for the multiple pathologies that contribute to a terminal liver disease. Its use as a therapeutic management tool for primary or metastatic hepatic malignancies is, however, controversial [9].

Initial treatment consists of performing resection at the anatomic site of the affected liver. In many cases, however, taking in consideration the infiltrative behaviour of the tumour, the presence of regional metastases and the distances between these satellites, it is not possible to perform a resection [1,10]. LT was, therefore, suggested as a potential better solution.

In 1990 Starzl and collaborators from the University of Pittsburgh published one of the first retrospective studies involving LT and malignant tumours, which reported a series of 1469 patients who received LT between 1980 and 1988. 115 of these patients received a LT due to malignancy. Two patients due to a Liver Angiosarcoma with 100% mortality in the first year and a high recurrence of the disease in the first three months after the LT [11]. In 2006, a retrospective series of 19 patients with a variety of primary sarcomas and metastatic tumours, which all received LT, was published. There were 6 cases of angiosarcoma and 13 cases of metastatic sarcoma; survival at 12 months was 20% with a 100% mortality at 15 months after LT [9].

Later, in 2013, the European Register of Liver Transplants published a retrospective study of 22 cases with liver angiosarcoma who received LT between 1983 and 2004, which where compared with 108 cases of patients that received LT due to Hemangioendotelioma. For patients with liver angiosarcoma, survival at 12 months was 24%, with mortality at 24 months of 100%; for patients with hemangioendothelioma, survival at 12 months was 87% [12]. This led to the conclusion that patients with liver angiosarcoma did not benefit from the LT. For this reason, after being evaluated by the Transplant Group, our patient was treated via a partial hepatectomy.

In 2014, a case report of a 5 years old female patient diagnosed with liver angiosarcoma was published in the Journal Paediatric Transplantation. She received a LT along with post-transplant management with Sirolimus. There was no recurrence of the disease until the 27th month, argued to be due to mTOR inhibitors regulating proliferation, differentiation and cell migration and generating an anti-neoplastic effect [13]. This case reintroduced LT as a therapeutic option in conjunction with adjuvant therapy.

Finally, in 2015 a retrospective series was performed in Taiwan, of 3503 patients with primary tumours of the liver. Thirteen had Liver angiosarcoma and received surgical management plus treatment with chemotherapy. This study showed a greater survival

rate, over 2 years: from 32 to 69 months in total [14]. Suggesting, as well as recent evidence, that liver Angiosarcoma must be treated aggressively with liver resection in order to improve patient's prognosis [15].

In our case report, given the high recurrence and high mortality in LT patients and the promising results using neoadjuvant therapy to increase the survival of patients, we decided to carry out a partial surgical resection of the affected liver parenchyma along with chemotherapy, demonstrating promising results in a rare and aggressive liver disease.

4. Conclusion

Liver Angiosarcoma is a rare tumour with a poor long-term prognosis due to massive haemorrhages and its high recurrence rate. Hence partial hepatectomy of the affected liver tissue with adyuvant therapy has been recognized to improve patients' survival when compared to liver transplant.

Conflicts of interest

The authors declare that there are no potential conflicts of interest to declare.

Ethical approval

Consent from the patient was secured for this case report and is available upon request.

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Author contribution

Mauricio Millan; Alejandro Delgado; Luis A. Caicedo; Gabriel J. Echeverri: Study concept and design. Mauricio Millan, Alejandro Delgado;,Liliana Caicedo; Mauricio Duque: Adquisition of data

Mauricio Millan, Alejandro Delgado; Ana M. Arrunategui; Carlos A. Meneses: Drafting of the manuscript and edition

Gabriel J. Echeverri; Mauricio Millan; Oscar Serrano, Jorge I. Villegas, Gabriel J. Echeverri, Luis A. Caicedo: Critical Revision of the manuscript for important intelectual content.

Guarantor

The guarantor for this manuscript is Gabriel J. Echeverri.

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