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Combined extended right hepatectomy with inferior vena cava resection and reconstruction with Gore-Tex graft

Klaus **STEINBRÜCK**, Renato **CANO**, Hanna **VASCONCELOS**, Bruno **RANGEL**, Reinaldo **FERNANDES** and Marcelo **ENNE**

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Malignant liver tumors can directly invade the inferior vena cava (IVC) due to anatomical proximity. In such cases, hepatectomy combined to IVC resection may be required to achieve negative surgical margins[1,2]. This approach becomes more common, due to progress in surgical techniques and perioperative management[3,4].

Herein, we present a case of a 42-year-old woman with a 23 cm hypervascular liver mass located on the right liver, extended to segments one and four, encompassing completely the IVC circumference, near the root of the left hepatic vein (LHV) (FIGURE 1). Preoperative diagnosis was between liver cell adenoma or hepatocellular carcinoma (HCC). Patient was taken to surgery, which was performed through a bilateral subcostal incision with midline extension (E-VIDEO). Initially, we performed a doppler ultrasonography to analyze the relationship between the tumor and vascular structures and assure that the LHV was not involved by the lesion. Next, the liver pedicle and infrahepatic IVC were taped to perform the liver's total vascular exclusion (TVE). Then, the right hepatic artery, right portal vein and right biliary duct were dissected, ligated and divided. Portal and arterial branches to caudate lobe were also divided. Suprahepatic IVC was then isolated and encircled. Hepatotomy was performed through the anterior approach, using an ultrasonic dissector/aspirator. Besides the selective ischemia of the right liver, Pringle maneuver was applied (two periods of 15-minutes clamping with 5-minutes of clamping-free), in order to minimize blood loss and ischemic time.

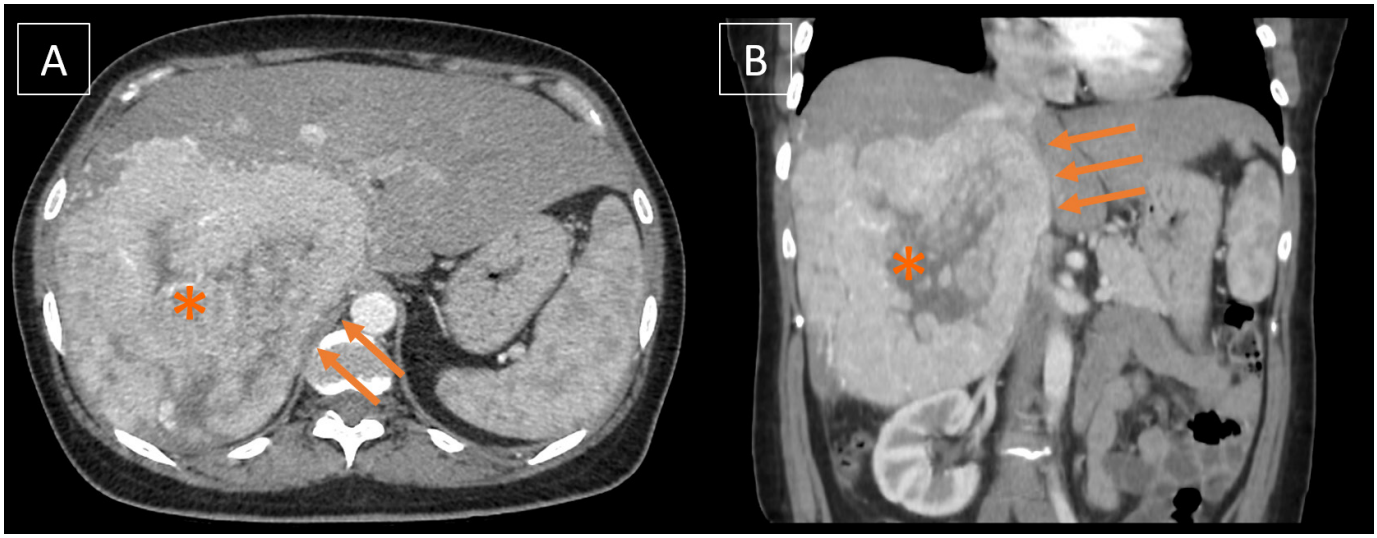

FIGURE 1. Axial **(A)** and coronal **(B)** CT scan images showing a hypervascular liver mass (*) involving the retrohepatic IVC (arrows).

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Hospital Federal de Ipanema, Unidade de Cirurgia Hepatobiliar, Rio de Janeiro, RJ, Brasil.
Corresponding author: Klaus Steinbrück. E-mail: steinbruck@gmail.com
E-VIDEO: https://youtu.be/pD4dUVKyil8

After identifying the middle hepatic vein in the transection plane, TVE was performed by clamping successively the portal triad, infrahepatic and suprahepatic IVC. Extended right hepatectomy and IVC resection was then completed. The LHV in the native vena cava remained untouched.

IVC was reconstructed with a 20 mm Gore-Tex graft, firstly sutured to the suprahepatic IVC. Sequentially the suprahepatic clamp was released and placed below the insertion of the LHV, allowing unclamping of the hepatic pedicle, for restoration of liver perfusion and diminishing ischemic time. The graft was then sutured to the infrahepatic IVC and the last clamp was released. TVE time was 20 minutes. Patient recovered well and was discharged on the 6th post-operative day. Histopathological analysis confirmed HCC. Patient is still alive 36 months after surgery, with graft patency (FIGURE 2).

Combined extended right hepatectomy and IVC resection is a safe and feasible procedure, that should be performed by a hepatobiliary team experienced in complex hepatectomies and liver transplantation. Despite being an aggressive surgical procedure, it may be the only curative option for patients with massive tumors involving the IVC.

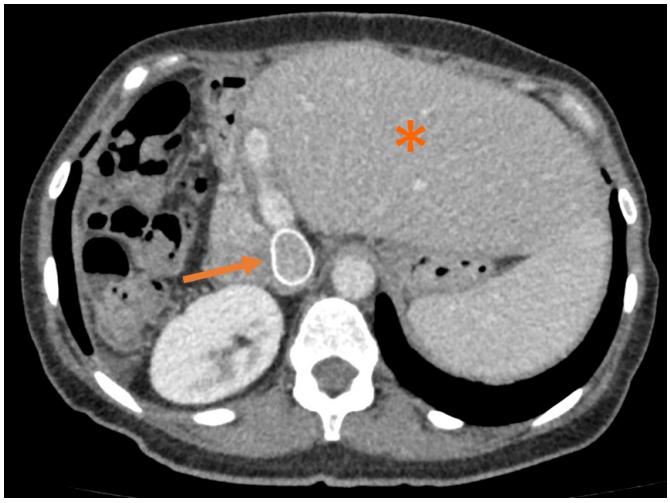

FIGURE 2. Long term postoperative axial CT scan image showing the hypertrophied left lateral liver sector (*) and patent IVC graft (arrow).

Authors' contribution

Steinbrück K, Cano R, Vasconcelos H, Rangel B, Fernandes R and Enne M: participated in the surgical procedure, designed the case report, collected data, wrote the paper, critically reviewed and approved the final version to be published.

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Klaus Steinbrück: 0000-0002-3601-7272.
Renato Cano: 0000-0002-4370-8194.
Hanna Vasconcelos: 0000-0002-6753-9372.
Bruno Rangel: 0000-0001-6744-9396.
Reinaldo Fernandes: 0000-0001-8759-2552.
Marcelo Enne: 0000-0002-8714-3295.

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