

First totally robotic mesohepatectomy with selective hepatic artery clamping for the treatment of a combined hepatocellular-cholangiocarcinoma

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Mesohepatectomy or central hepatectomy is the removal of the hepatic segments drained by the middle hepatic vein (sg 4,5,8). It is a technically demanding procedure and an alternative to extended hepatectomies to treat centrally located liver tumors⁽¹⁾. The main advantage of this parenchymal sparing procedure is to avoid postoperative liver failure⁽²⁾. Although minimally invasive approaches have several advantages over the traditional open approach and laparoscopic mesohepatectomies have been previously described, a robotic mesohepatectomy for the treatment of a combined hepatocellular-cholangiocarcinoma (cHCC-CC) has not been previously described.

In this multimedia article we present a robotic mesohepatectomy with selective hepatic artery clamping instead of the use of intermittent Pringle maneuver to treat a centrally located cHCC-CC in a patient with chronic hepatic disease.

The patient was a 73-year-old male with previous history of hepatitis C related chronic hepatic disease submitted to routine image studies that disclosed a hepatic tumor. A magnetic resonance with hepatobiliary intravenous contrast agent was performed and disclosed signs of chronic hepatic disease and a 6 cm tumor in the hepatic segment four with no enhancement in the late hepatobiliary phase suggestive of a cholangiocarcinoma. Hepatic volumetry estimated a total hepatic volume of 1750 cm³, the left liver with 882 cm³, the left lateral sector with 630 cm³ and the right liver with 868 cm³ (FIGURE 1).

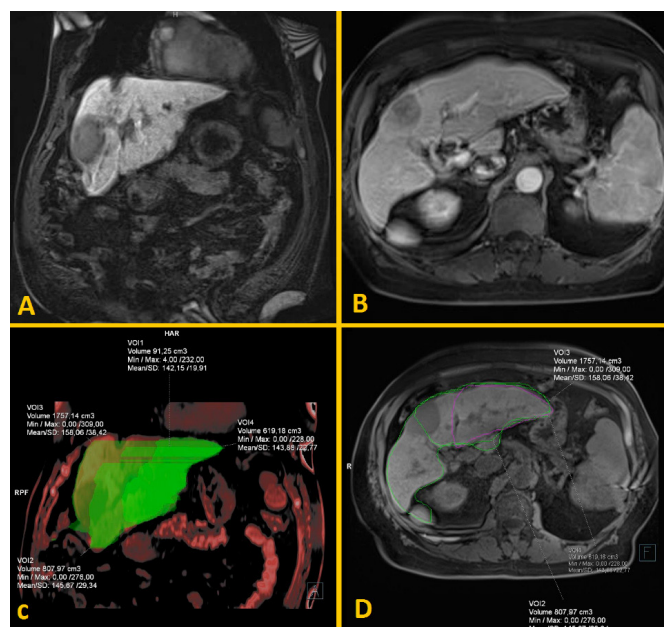


FIGURE 1. Hepatobiliary specific contrast enhanced magnetic resonance image study. A, B) Liver with signs of chronic hepatic disease and tumor in segment 4: A) coronal plane; B) axial plane; C, D) hepatic volumetry disclosing total liver volume of 1750 cm³, left lateral sector with 630 cm³ and the right liver with 868 cm³: C) coronal plane; D) axial plane.

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*E-VIDEO: <https://youtu.be/gguw707V-xQ>

A robotic mesohepatectomy with selective hepatic artery clamping was performed (FIGURE 2, E-VIDEO*). Operative time was 5 hours. Estimated blood loss was 200 milliliters. Postoperative period was uneventful. The patient was discharged on the fifth postoperative day. He developed mild ascites treated with espironolactone 50 mg p.o. daily for 1 month. Final pathology disclosed a 6.0 cm cHCC-CC with free surgical margins. Three months after the procedure, a magnetic resonance was performed and did not disclose focal hepatic lesions (FIGURE 3).

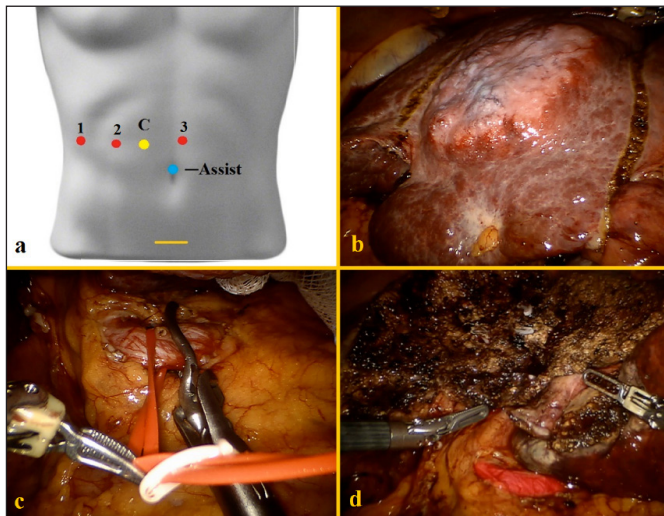


FIGURE 2. Robotic mesohepatectomy. A) trocar placement (1-3 robotic arms: 1- Prograsp for retraction; 2- Maryland Bipolar Forceps- fenestrated; 3- Fenestrated Bipolar Forceps – Bipolar Cadiere. C: robotic camera. (Assist: assistant port); B) cHCC-CC, chronic hepatic disease and lines of transection; C) selective hepatic artery clamping; D) final aspect. (cHCC-CC: combined hepatocellular-cholangiocarcinoma).

While minimally invasive hepatectomies became a well-established approach with several advantages over the open approach, laparoscopic central hepatectomies are technically challenging procedures rarely performed⁽¹⁾. Although the robotic approach was developed to compensate innumerable technical limitations imposed by the laparoscopy, robotic mesohepatectomies have been rarely described, and not for the treatment of a cHCC-CC^(3,4). We described the first totally robotic mesohepatectomy with selective hepatic artery clamping instead of intermittent Pringle maneuver. Although not previously tested in large clinical studies, we regularly use the selective clamping of the hepatic artery instead of the conventional Pringle maneuver to reduce bleeding during hepatic transection as previously published, and it has proved to be a safe and an effective alternative to avoid remnant liver warm ischemia and reduce the risk of postoperative hepatic failure, especially in patients with chronic hepatic disease^(5,6).

Therefore, totally robotic mesohepatectomy with selective hepatic artery clamping is a promising alternative for minimally invasive treatment of centrally located hepatic tumors.

Authors' contribution

Surjan RCT: wrote the article. Surjan RCT: and Silveira SP: designed the study. Bustamante-Lopez LA: performed data collection. Surjan RCT, Silveira SP and Bustamante-Lopez LA: provided critical advice. All authors discussed the results and commented on the article and take full responsibility on the manuscript.

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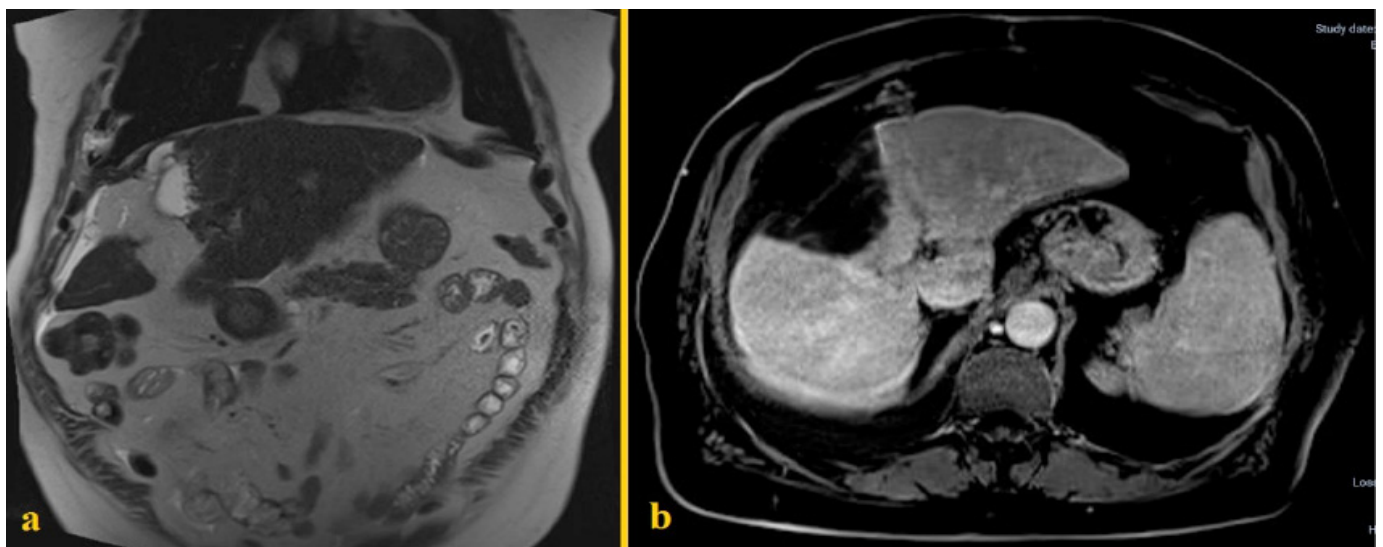


FIGURE 3. Hepatobiliary specific contrast enhanced magnetic resonance image study performed 3 months after the robotic central hepatectomy disclosing no signs of recurrence. A) coronal plane; B) axial plane.

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Palavras-chave – Hepatectomia; robótica; colangiocarcinoma.

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