



Robotic Resection of Postero-Superior Liver Segments (7,8) (with Video)

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Abstract

Background Surgical resection is the standard treatment for colorectal liver metastases. Parenchyma-sparing technique should always be attempted to prevent postoperative liver failure and increase the opportunity to perform repeated resections in cases of recurrent malignancy. Postero-superior liver resection is defined as the anatomical removal of liver segments 7 and 8, however, minimally invasive resection of postero-superior liver segments is considered a difficult and complex operation and thus is rarely reported.

Methods We present the video of a robotic postero-superior liver resection in a 54-year-old male patient with a synchronous, single, and large colorectal metastasis in the postero-superior liver sector. The Da Vinci Xi system was used. The right liver was mobilized with exposure of the inferior vena cava (IVC), following by intraoperative ultrasound, used to locate the tumor and establish its relationship to the right hepatic vein and portal pedicles from segments 7 and 8. A thick hepatic vein draining directly to the IVC was controlled with hem-o-lock and the right hepatic vein was divided using an endoscopic stapler. The surgical specimen was removed through a supra-pubic incision.

Results Operative time was 205 minutes, and the estimated blood loss was 310 mL. The patient's recovery was uneventful with no need for admission to the intensive care unit or for blood transfusion. Pathology confirmed colorectal metastasis with free surgical margins. **Conclusions:** Robotic resection of postero-superior liver segments is feasible and safe and may have some advantages over laparoscopic and open approaches. This video may help gastrointestinal surgeons perform this complex procedure.

Keywords robotic · liver · postero-superior segments

Surgical resection is the standard treatment for colorectal liver metastases. Interventions should always attempt to preserve liver parenchyma to prevent postoperative liver failure and increase the opportunity to perform repeated resections in cases of recurrent malignancy. A better knowledge of liver anatomy and the use of intraoperative ultrasound have provided the basis for segmental liver resection. Postero-superior liver resection or bisegmentectomy 7–8 is defined as the

anatomical removal of liver segments 7 and 8. However, until recently, this type of operation was considered only for patients with a large accessory right hepatic vein, but further studies concluded that it could be safely performed in the absence of this vein, and this procedure became more common.¹ However, minimally invasive resection of postero-superior liver segments is considered a difficult and complex operation and thus is rarely reported.^{2, 3}

We present the video of a robotic postero-superior liver resection in a patient with a solitary metastasis. A 54-year-old man with a synchronous, single, and large (7.3 × 6.4 cm) colorectal metastasis in the postero-superior liver sector was referred to us for treatment, and a multidisciplinary team decided on neoadjuvant chemotherapy with Folfirinox. After 4 cycles, an objective response was achieved with a marked reduction in dimensions, and robotic liver resection was indicated and consent was obtained. During the operation, a clearly damaged liver with steatosis and sinusoidal obstruction was

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observed and a parenchymal-sparing operation seemed logical.

The Da Vinci Xi system was used and docked from the left flank, and four robotic arms (8 mm) were placed along with two additional laparoscopic ports (5 and 12 mm). The surgeon was seated at the robotic console, and the assistant surgeon stood on the patient's left side to perform suction, irrigation, clipping, stapling, and change the robotic instruments. The right liver was completely mobilized with exposure of the retrohepatic inferior vena cava (IVC), followed by intraoperative ultrasound, used to locate the tumor and establish its relationship to the right hepatic vein and portal pedicles from segments 7 and 8. The future line of transection was marked with cautery along the liver surface and guided by ultrasound to ensure free margins. Intermittent Pringle maneuver was applied using a vascular clamp through the 5 mm port, and the liver was divided using bipolar forceps under saline irrigation. A thick hepatic vein draining directly to the IVC was controlled with hem-o-lock, and the right hepatic vein was divided using an endoscopic stapler. The surgical specimen was removed through a supra-pubic incision, and the abdominal cavity was drained with a closed-suction drain. The Pringle maneuver was applied intermittently for 68 min, the total operative time was 205 min, and the estimated blood loss was 310 mL. The patient's recovery was uneventful with no need for admission to the intensive care unit or for blood

transfusion. Pathology confirmed colorectal liver metastasis with free surgical margins (closest 1.9 cm) and tumor regression grade of 3.

Robotic resection of postero-superior liver segments is feasible and safe and may have some advantages over laparoscopic and open approaches. This video may help gastrointestinal surgeons perform this complex procedure.

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