Case Report

Laparoscopic resection of hepatocellular carcinoma following liver transplantation: a video case report

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Abstract: Laparoscopy in the setting of cirrhosis has been described as having favorable outcomes compared to open in terms of collateral preservation, diminished manipulation, less fluid requirement, reduced blood loss and transfusion rates leading to better short-term outcomes. Hepatocellular carcinoma (HCC) following liver transplantation (OLT) is frequent considering recurrence and *de-novo* lesions and the role of laparoscopy in this setting is unclear. In this setting, a minimally invasive approach could be indicated but should be considered with caution for the possibility of finding strong adhesions limiting the working space and because of the impossibility of performing the Pringle maneuver in case of bleeding. To the best of our knowledge, there are currently no reports of such an approach among the literature. We hereby present the video case report of a patient undergoing laparoscopic liver resection (LLR) following the diagnosis of a HCC in the liver "graft". A 65-year-old male presented to our department for routine follow-up; He received OLT in May 2008 for liver cirrhosis HCV related and HCC. A CT scan showed a 40 mm lesion that was diagnosed as an HCC (LIRADS classification 5). The patient was scheduled for a LLR. A 4-trocar technique was carried out using high energy device and bipolar forceps. No nasogastric tube was placed. The patient was put on clear liquids diet on postoperative day (POD) 1. On the second POD solid food intake was allowed. The drainage was removed in 3rd POD and the patient was discharged home without complications. Laparoscopic resection of HCC following liver transplantation is safe and feasible and should be considered as a first approach possibly improving outcomes.

Keywords: Hepatocellular carcinoma (HCC); liver resection; laparoscopy

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Since its first introduction in 1991, laparoscopic liver resections (LLRs) have been widely performed, with benefits in terms of postoperative morbidity, estimated blood loss, length of hospital stay and pain management. Furthermore, after an initial limitation it has nowadays gained acceptance for the treatment of primary and secondary liver malignancies (1). In patients who necessitate resection for hepatocellular carcinoma (HCC), the presence of cirrhosis is frequent and despite this, different centers have reported favorable outcomes of LLR compared to open in this setting: collateral preservation, diminished manipulation, less fluid requirement, reduced blood loss and transfusion rates, have been related to better short- and even long-term outcomes (2,3). It is also true that some patients with HCC are selected and undergo liver transplantation instead of resection or following liver resection for downstaging purposes (4). It is a matter of fact that transplanted patients with viral liver cirrhosis regardless the presence of a tumor at the time of transplantation are at risk of developing HCC during follow-up which could be a recurrence or a *de novo* tumor (5). In this setting, a minimally invasive approach could be indicated for the well-known benefits

Figure 1 Video case report of laparoscopic resection of hepatocellular carcinoma following liver transplantation (6). Available online: http://www.asvide.com/article/view/31189

but should be considered with caution for the possibility of finding strong adhesions limiting the working space and furthermore because of the impossibility of preparing and performing the Pringle maneuver in case of bleeding. To the best of our knowledge, there are currently no reports of such an approach among the literature.

We hereby present the case of a patient undergoing LLR following the diagnosis of an HCC following liver transplantation.

Case presentation

A 65 years old male [height 180 cm, weight 80 Kg, body mass index (BMI) 25.9] presented to our department for his routine follow-up; patient has a history of hepatitis C infection (3a genotype) associated with liver cirrhosis and HCC treated with orthotopic liver transplantation in May 2008. During routine ultrasound imaging in January 2018 a suspicious liver lesion was found in the context of segment 4b of the transplanted liver. Further computerized tomography (CT) scan showed a 40 mm lesion with arterial enhancement with a visible feeding artery and venous washout that was diagnosed as a HCC (LIRADS classification 5). The patient was therefore scheduled for a LLR after obtaining informed consent (*Figure 1*).

The past medical history includes non-insulin dependent diabetes, orthotopic liver transplantation trough a J-shaped incision in 2008, and an open appendectomy 40 years ago. Patient is in therapy with Tacrolimus and Mycophenolate Mofetil immunosuppressive drugs and Sitagliptin for diabetes.

Blood works were within normal limits; alpha-fetoprotein was 4 ng/mL.

The patient was placed in a French position, with the surgeon in between the legs and one assistant on the left side of the patient. A 40° anti-Trendelenburg was undertaken.

The first 10 mm trocar was placed sub-umbilically through an open laparoscopy technique. A 12-mmHg pneumoperitoneum was performed. After the exploration of the abdominal cavity, one more 10 mm trocar was placed in the left flank and a careful adhesiolysis was undertaken. Once the majority of the abdominal wall adhesions have been taken down, two extra 5 mm ports were placed in the right upper quadrant and in the left flank. A liver lesion was seen in segment IVb. Intraoperative ultrasound was performed, and the margins of the lesions were evaluated. A feeding artery was confirmed. The limits of liver resection and the feeding artery were marked on the liver capsule with cautery. A wedge resection with wide free margins was performed using Ligasure™ Atlas (Covidien Inc, Minneapolis, Minnesota, USA) and bipolar forceps for hemostasis. Hemolock clips were used for large vessels (i.e., feeding artery). The specimen was extracted trough the enlargement of the sub umbilical 10 mm trocar access. One drainage was left in place. No nasogastric tube was placed.

The patient was put on clear liquids diet on postoperative day (POD) 1. On the second postoperative day solid food intake was allowed. The drainage was removed in 3rd POD and the patient was discharged home without complications.

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Footnote

Conflicts of Interest: The authors have completed the ICMJE uniform disclosure form (available at http://dx.doi.org/10.21037/ls.2019.02.01). GV serves as an unpaid editorial board member of *Laparoscopic Surgery* from June 2018 to May 2020. The other authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are

appropriately investigated and resolved. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Declaration of Helsinki (as revised in 2013). Written informed consent was obtained from the patient for publication of this manuscript and any accompanying images.

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