



## CASE REPORT

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# First case of laparoscopic donor hepatectomy in Türkiye

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## ABSTRACT

Living donor liver transplantation is an important treatment option in countries like ours where cadaver donors are insufficient. This surgery is a major operation for the donor as well as the recipient. We should minimize the damage to donors who come for organ donation in a healthy way and minimize the risks of such a major surgery. For this purpose, we have explained the details of the first laparoscopic donor hepatectomy surgery performed in our country.

**Keywords:** Live liver transplantation, donor hepatectomy, laparoscopy

## INTRODUCTION

The advantages of laparoscopic surgery over open surgery such as smaller incision, less bleeding, faster recovery and faster return to normal life are well known. After the start of laparoscopic liver surgery 30 years ago, surgical techniques progressed to the first laparoscopic live donor liver transplantation (LDLT) in 2002 (1,2). Laparoscopic surgery is an effective way for the liver donors. Herein, we describe the details of the first laparoscopic living donor hepatectomy in Türkiye.

## CASE REPORT

A 6-month-old (height 67.5 cm, weight 9.6 kg) boy suffering from biliary atresia was referred to our transplant center. The mother, a 30-year-old healthy person, volunteered to donate part of her liver. After a detailed evaluation was performed to rule out potential contraindications, living donation was accepted. Pre-donation workup for estimated graft weight was done with Myrian® Imaging Layer (Intrasense Company, Montpellier, France) and it was 200 g for the left lateral segment of liver. In the pre-operative imaging; the liver graft had a single left hepatic artery, a single ostium for the biliary ducts, and no anatomical variation in the left portal and hepatic veins were identified. The donor's consent for laparoscopic hepatectomy was obtained along with the approval of standard donor hepatectomy. And a pure laparoscopic left lateral sectionectomy was performed.

## The Procedure

The donor was placed in supine and 30° reversed-Trendelenburg position with the surgeon standing between the patient's legs (Figure 1). Onset of surgery, 1.2 mg indocyanin green (ICG-Pulsion Medical Systems, Feldkirchen, Germany) diluted to 10 mL and was intravenously injected, thus allowing prompt visualization of the biliary duct. Of the five trocars (5/5/12/12/12 mm), 1 of 12 mm was inserted on the umbilicus, 2 of 12 mm were inserted on the upper abdominal quadrants, and 2 of 5 mm were inserted lateral of upper abdominal quadrants (Figure 2). A 45° optical device (Karl Storz ICG fluorescent laparoscope, Tuttlingen, Germany) was used. The CO2 pressure was kept around 12 mmHg. The gallbladder was preserved. After a careful evaluation to search for anatomical landmarks, the falciform and the left triangular ligaments were divided with the Ligasure device (Covidien, USA) to

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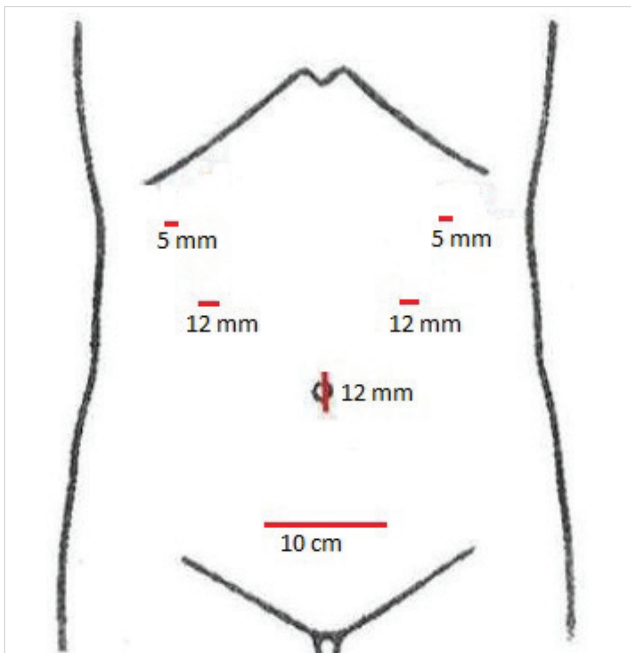
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**Figure 1.** Laparoscopic donor hepatectomy operation.



**Figure 2.** Placement of trocars.

release left lobe of liver and to find and tape the left hepatic vein. Thereafter, hilum dissection to expose, free and tape both the left hepatic artery and the left portal vein was done with hook. Caudate branches were sealed by Ligasure and hemoclips to maximize the length of the left portal vein. Parenchymal dissection was done using ultrasound dissector CUSA (Excel Valleylab, Integra, Ireland) along the right side of the falciform ligament. Low central venous pressure was used during parenchymal resection (<5 mmHg). Hemostasis and biliostasis of small vessels were made by bipolar electrocautery, Ligasure and using titanium clips. Once the dissection reached the hilar plate, the left biliary duct was clipped and cut under the negative fluorescence imaging guidance with straight laparoscopic

scissors. The left hepatic vein was completely freed and taped at its confluence by cutting collaterals draining into the middle hepatic vein. A modified hanging maneuver was used during dissection with the CUSA. At this point, a Pfannenstiel incision was made, a 12 mm trocar was inserted to allow atraumatic harvesting of the graft via putting it into the endobag. The left lateral lobe was procured as follows: Hem-o-lock clip on the left hepatic artery, 30 mm Echelon Flex™ Staplers (Ethicon, USA) on the left portal vein and the left hepatic vein. After taking out the graft through the endobag with three minutes warm ischemia time, the graft (188 g) was flushed on the back table with 1 L of Belzer solution and the graft was prepared for transplantation. 3% hydrogen peroxide was sprayed on the liver cut surface to control bile leakage. After that, a silastic Jackson-Pratt (JP) drain under suction assured the drainage of the donor operative field (Figure 3). The total operative time of the donor surgery was 390 minutes. Liver transplantation was carried out with a total of five minutes donor warm ischemia time. The donor blood tests were normal except for a slight elevation in alanine aminotransferase (ALT) level. No blood transfusion is needed.



**Figure 3.** Postoperative incision scars.

She was discharged on the fourth postoperative day (POD) after removing the JP drain. The donor was followed for two years with no complication.

Regarding the recipient, the early and late post-operative periods were uneventful.

## DISCUSSION

Unfortunately, in the east, cadaveric organ donation is not sufficient for the treatment of liver diseases. In countries like ours, demand of organs are mostly provided by living donors, so LDLT has become a well-known treatment option for the patients with acute and chronic liver disease. With this surgery, a healthy person is exposed to a significant risk of morbidity and mortality for another person. Therefore donor surgery should be performed safely and possible complications should be minimized. It is essential that this risky situation is well understood by the donor. Laparoscopic donor hepatectomy surgery which should be performed by an experienced surgical team, providing less blood loss, earlier postop mobilization and oral intake, shorter hospital stay, and faster return to normal life (3).

In our case this life-saving procedure was performed for a pediatric patient from a living donor, who was a young and healthy mother. In important stages such as hepatic vein dissection and hilar dissection, it was possible to view the operative area from various angles with a magnified view, since the optical camera we use was 45°. In this way, the safety of the surgery is also increased. We used ICG to view the biliary tract. We were able to distinguish between the right and left bile duct very clearly and we were able to stay at a safe distance away from the right biliary tract while cutting the left bile duct and closing the stump. We used the technique of spraying 3% hydrogen peroxide on the cut surface, which is also described in the literature, in order to control possible bile leakage after parenchymal transection (4).

The duration of the operation is 390 minutes, and we think it will be shortened over time, considering the learning curve. Since there was no large incision in the upper abdomen after the surgery, pain was not a serious problem for our patient and she could tolerate breathing exercises very well. The patient, who had no problems in terms of mobilization and tolerating oral intake, could be discharged on the fourth POD. The patient did not require any peroperative or postoperative blood transfusions. And after two years, she is living her normal life and no complications have developed.

Living liver donors are generally young and healthy and care about cosmetic results. Although being a donor is not encouraged, there is a reality about the cosmetic advantage of laparoscopic surgery. In addition, it is obvious that by minimizing abdominal wall damage, the risk of complications such as incisional hernia and chronic wound pain is reduced (5,6).

Laparoscopic donor hepatectomy has been well validated for its safety and advantages. Nowadays, it has been pointed out that laparoscopic donor left lateral sectionectomy is considered the standard technique, and therefore, it has become a standard option recommended to donors in many experienced centers (7,8).

**Informed Consent:** Informed consent was obtained from patient who participated in this case.

**Peer-review:** Externally peer-reviewed.

**Author Contributions:** Concept - AA, TK; Design - CK, ŞÇ, NM; Supervision - MK; Materials - CK, ŞÇ, NM; Data Collection and/or Processing - CK; Analysis and/or Interpretation - NM; Literature Search - ŞÇ; Writing Manuscript - CK; Critical Reviews - TK.

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**OLGU SUNUMU-ÖZET**

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**Türkiye'deki ilk laparoskopik donör hepatektomi olgusu**

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**ÖZET**

Canlı vericili karaciğer nakli bizimki gibi kadavra donörlerinin yetersiz kaldığı ülkelerde önemli bir tedavi seçeneğidir. Bu ameliyat, alıcı için olduğu kadar verici için de büyük bir ameliyattır. Sağlıklı bir şekilde organ bağışi için gelen donörlerin zararlarını en aza indirmeli ve böylesine büyük bir ameliyatın risklerini en aza indirmeliyiz. Bu amaçla, ülkemizde ilk kez gerçekleştirilen laparoskopik donör hepatektomi ameliyatının detaylarını anlattık.

**Anahtar Kelimeler:** Canlı vericili karaciğer nakli, donör hepatektomi, laparoskopi

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