Delayed-Onset Chylous Ascites After a Living-Donor Liver Transplant: First Case Successfully Treated With Conservative Treatment?

Jian-Han Chen, Chun-Ming Chang, Min-Chi Lu, Chang-Kuo Wei, Wen-Yao Yin

Abstract

Chylous ascites is a rare complication in liver transplant. Few cases have been reported to date. In most cases, chylous ascites is diagnosed within 1 month after surgery because of intraoperative injury of the hilar lymphatic system. Preoperative massive ascites and use of a LigaSure vessel sealing system for hilar dissection have been reported as risk factors.

We report a case of chylous ascites after a living-donor liver transplant that was diagnosed after 6 months of uneventful follow-up. Sirolimus was added to cyclosporine early (2 wk after the operation) owing to poor renal function and it was found to be high (> 22 ng/mL) when the chylous ascites occurred. The patient was treated with total parenteral nutrition in combination with Sandostatin and rapid tapering of sirolimus after the failed initial conservative treatment. Residual abdominal fullness after meals and lymphedema of the legs disappeared 1 month after discontinuing sirolimus. This is the first case of delayed-onset chylous ascites after a liver transplant that was successfully treated conservatively.

Key words: Delayed onset chylous ascites, Living-donor liver transplant, Preoperative massive ascites, LigaSure vascular sealing system

Introduction

Chylous ascites is a rare complication of liver transplant. To our knowledge, there are only 11 articles including 10 case reports1-9 (Table 1) and 1 retrospective case series study including 24 cases.10 In most of these cases, chylous ascites is diagnosed within 1 month after surgery. In only 1 case, the complication was diagnosed 9 months after liver transplant, and the patient failed to respond to a low-fat diet containing medium chain triglycerides but was treated successfully with a peritoneal venous shunt. Preoperative massive ascites, a low albumin level, and use of a LigaSure vessel sealing system (LVSS) (Covidien; Mansfield, MA, USA) for hilar dissection were associated with higher incidence in the Yilmaz study (4.7% vs 0.6%-1.6%).10

Case Report

This 56-year-old man, with hepatitis C virus (HCV) and alcoholic-related end-stage liver disease, underwent a living-donor liver transplant on July 31, 2012. His 27-year-old daughter donated the right lobe liver with a reconstructed middle hepatic vein weighing 615 grams, and the graft-to-recipient weight ratio was 1.18%. No significant dilated lymphatics or leakage of chylous fluid owing to injury of the cisterna chili occurred during the operation. We used anti-CD 25 (basiliximab) for induction therapy, and a calcineurin inhibitor (cyclosporine), steroids, and mycophenolate acid as maintenance immunosuppression. Sirolimus was added to reduce the cyclosporine dosage early (2 wk after surgery) owing to poor renal function. During the first 3 months, the sirolimus level remained at 8 to 15 ng/mL and cyclosporine level remained low (60-100 ng/mL). The patient’s postoperative course was uneventful, and he was discharged at postoperative day 32 without any chylous discharge from the subhepatic drain. Until the sixth postoperative month, no accumulation of free fluid was noted by routine monthly abdominal sonography.
Table 1. Previous Cases Report in Literature

<table>
<thead>
<tr>
<th>Journal (ref)</th>
<th>Age (Y/O)</th>
<th>Tx Type</th>
<th>Diagnosis (d)</th>
<th>Treat (d)</th>
<th>Methods</th>
<th>Duration (d)</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asfar et al4</td>
<td>55</td>
<td>DDLT</td>
<td>4</td>
<td>17</td>
<td>Elemental diet + MCT</td>
<td>51</td>
<td>Cured</td>
</tr>
<tr>
<td>Shapiro5</td>
<td>55</td>
<td>DDLT</td>
<td>10</td>
<td>19</td>
<td>Low Fat Diet + TPN + octreotide</td>
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<td>Cured</td>
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<tr>
<td>Haberal6</td>
<td>4</td>
<td>LDLT</td>
<td>13</td>
<td>14</td>
<td>Surgical ligation</td>
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<td>36</td>
<td>DDLT</td>
<td>12</td>
<td>14</td>
<td>NPO + TPN</td>
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<td>Saab1</td>
<td>49</td>
<td>DDLT</td>
<td>&gt;270</td>
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<td>Cured</td>
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<tr>
<td>Ijichi3</td>
<td>40</td>
<td>LDLT</td>
<td>21</td>
<td>21</td>
<td>Low Fat Diet + TPN + octreotide</td>
<td>131</td>
<td>Cured</td>
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<td>3.5</td>
<td>LDLT</td>
<td>15</td>
<td>15</td>
<td>NPO + TPN Somatostatin MCT</td>
<td>Expired</td>
<td></td>
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<tr>
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<td>5</td>
<td>LDLT</td>
<td>14</td>
<td>14</td>
<td>NPO + TPN MCT + Sandostatin</td>
<td>10</td>
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</tr>
<tr>
<td>Shiba8</td>
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<td>LDLT</td>
<td>22</td>
<td>N/A</td>
<td>TPN for 9 d</td>
<td>24</td>
<td>Cured</td>
</tr>
<tr>
<td>Mukerji9</td>
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<td>DDLT</td>
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<td>11</td>
<td>Fat-free diet TPN + octreotide</td>
<td>81</td>
<td>Cured</td>
</tr>
</tbody>
</table>

Abbreviations: DDLT, deceased-donor liver transplant; Diagnosis, interval between tx and diagnosis; Duration, duration of treatment; LDLT, living-donor liver transplant; MCT, medium chained triglyceride; N/A, not available; NPO, no oral intake; ref, reference; TPN, total parenteral nutrition; Treat, start treatment after diagnosis; Tx, transplant; y/o, year-old

About 6 months after transplant, his abdomen became distended, and periumbilical pain that radiated to his back (associated with bilateral lower limb numbness) was aggravated by lying on his back. His sirolimus level was high, with the trough level of about 22.4 ng/mL. Abdominal sonography showed new-onset ascites, and chylous ascites was proven by laparoscopic examination to rule out peritoneal carcinomatosis and the presence of elevated ascites triglyceride concentration (5.09, mmol/L; normal, 1.8 mmol/L). No definite finding was obtained by cytology, culture, and thoracoabdominal computed tomography. He was treated with total parenteral nutrition for about 1 month combined with octreotide acetate for injectable suspension (Sandostatin) (2 wk), after the initial failure of conservative treatment. His sirolimus dosage also was reduced from 1 mg daily to 1 mg every other day, to lower the serum level to 3 to 5 ng/mL. The chylous ascites gradually decreased in volume and changed to serous ascites during the latter part of the clinical course and remitted uneventfully. Residual abdominal fullness, especially after meals and left leg lymphedema, disappeared 1...
month after we stopped sirolimus during outpatient follow-up. The patient’s hospital course is summarized in Figure 1.

**Discussion**

Chylosus ascites after liver transplant is commonly diagnosed within 1 month after surgery.1-10 This is the first case of delayed-onset chylous ascites after liver transplant successfully managed conservatively. Chylous ascites developed about 6 months after a living-donor liver transplant. A case diagnosed 9 months after a liver transplant1 was reported before, but failed to respond to conservative treatment and needed a peritoneal venous shunt. Our patient, however, was successfully treated conservatively with total parenteral nutrition, octreotide, and rapid tapering of mammalian target of rapamycin inhibitor, sirolimus.

Preoperative massive ascites, a low albumin level, and use of the LVSS for hilar dissection may be a fundamental cause for this patient.10 Because our case had a severely tense abdomen, a link to massive ascites with respiratory difficulty and poor intake, he received repeated paracentesis (biweekly) to relieve symptoms and frequent supplements of intravenous albumin infusion.

We also used LVSS, apart from ligation for hemostasis, during total hepatectomy in the recipient. Therefore, we cannot completely rule out this surgical method as an important cause of chylous ascites in our patient, although we did not realize any intraoperative and immediate or early postoperative chylous leak. Dislodge or absorption of covering blood clots or coagulated tissue from temporary and inadequately healed area of injured lymphatic system was probably due to using the LVSS for hemostasis.

Another factor to consider is the use of sirolimus for such high-risk patients. Some studies have shown that mammalian target of rapamycin inhibitor is a downstream signal of vascular endothelial growth factor C and D, which are essential for lymphatic endothelial cell survival, proliferation, and migration, and that mammalian target of rapamycin inhibitor such as sirolimus can inhibit lymphangiogenesis in vitro.11,12

Chylous ascites and lymphedema in a renal transplant case were attributed to 19-month use of mammalian target of rapamycin inhibitor (eg. sirolimus), and they were relieved 1 month after switching to cyclosporine.13 Interestingly, all these reported sirolimus-related cases (including ours) were diagnosed after at least 3 months use of sirolimus.14-17 Therefore, early use of sirolimus in our case should not be neglected as a possible cause of delayed-onset chylous ascites.

Once chylous ascites is diagnosed, most patients can be treated successfully with conservative measures; few cases require surgery. However, the first patient with delayed-onset chylous ascites reported in literature had to undergo surgical intervention. Here, we share our experience of successful conservative treatment for this entity. The cause of chylous ascites after a liver transplant should be multifactorial, and all possible risk factors should be carefully considered, and a multidisciplinary approach is necessary for excellent results.

In conclusion, chylous ascites is a rare complication after liver transplant. Most reported cases are diagnosed within 1 postoperative month. Preoperative poorly controlled ascites or application of the LVSS during dissection, especially in hilar region, increase the risk of postoperative chylous ascites. Sirolimus also should be carefully used or avoided, especially in the early posttransplant days in high-risk patients. The cause of chylous ascites after a liver transplant should be multifactorial, and all possible risk factors should be considered and a multidisciplinary approach is necessary for excellent results.

**References**


