

Acute Appendicitis Post Liver Transplant: A Case Report and Literature Review

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Abstract

Although acute appendicitis is common, reported cases after orthotopic liver transplant are rare. A 29-year-old woman presented to the emergency department with right lower-quadrant pain and mild leukocytosis 2 years after having a liver transplant. A computed tomography scan revealed an inflamed appendix. On operation, an injected appendix was noted, and she underwent an uncomplicated laparoscopic appendectomy. Histology confirmed the diagnosis and her postoperative course was unremarkable. Owing to the rarity of these cases and paucity of knowledge on management, a high index of suspicion and immediate intervention are required to prevent major complications. This case is the first successful laparoscopic appendectomy after liver transplant ever reported.

Key words: Appendix, Inflammation, After-liver transplant, Laparoscopy, Appendectomy

Introduction

Although acute appendicitis accounts for over 1-million patient days of admission in the United

States, with a lifetime risk of 8.6% and 6.7% for men and women,¹ fewer than 25 cases of acute appendicitis have been reported after liver transplant.²⁻⁵ The impaired immune function in these patients usually predisposes them to a delay in diagnosis owing to an atypical presentation, and this may increase the complication rate.² The present case discusses acute appendicitis after a liver transplant, the requirement for a high index of suspicion in this unique group of patients, feasibility of laparoscopic appendectomy, and extensive review of literature on the subject.

Case Report

A 29-year-old woman presented to the emergency department with a 12-hour history of right lower-quadrant pain, and nonbloody diarrhea. She denied having fever, chills, nausea, anorexia, vomiting, or recent travel. Her past medical history was significant for ulcerative colitis (diagnosed in 1998) and primary sclerosing cholangitis (diagnosed in 2003), with subsequent liver failure requiring orthotopic liver transplant (OLT) in June 2008. She was on tacrolimus 5 mg daily and mycophenolate 500 mg twice a day. Her vital signs included a temperature of 37.0°C, a heart rate of 83 beats/minute, blood pressure of 122/83 mm Hg, a respiratory rate of 18 breaths/minute, and oxygen saturation of 95% on room air. She was in no acute distress, and an abdominal examination revealed a right lower-quadrant that was tender to palpation. No mass or tenderness was noted on digital rectal examination. Her white blood cell count was 13.6×10^9 /L with a left shift. Owing to a high index of suspicion for appendiceal pathology, a contrast computer tomography scan (CT scan) of the abdomen and pelvis was obtained that showed diffuse thickening of the appendix, which measured

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1.1 cm in diameter and was surrounded by mesenteric fat (Figure 1). The patient was taken to the operating suite where she underwent an uncomplicated laparoscopic appendectomy. Her hospital course was unremarkable and she was discharged home on postoperative day 1. The final pathology was consistent with acute appendicitis (Figure 2A and 2B). The patient is now 5 months from surgery without any issues.



Figure 1. Computed tomography scan showing dilated appendix with periappendiceal inflammation (see arrow).

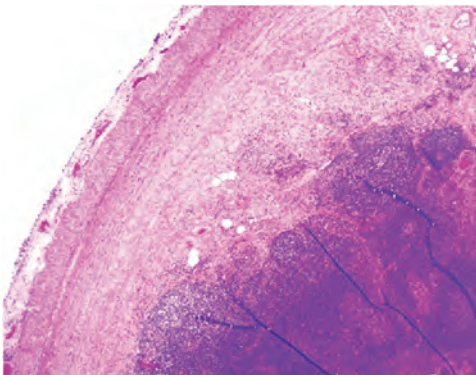


Figure 2A. Low-power image of the appendiceal wall showing normal lymphoid cells in the lamina propria, smooth muscle wall with increased inflammatory cells, and serositis (edematous, mesothelial hyperplasia, mixed acute, and chronic inflammation).

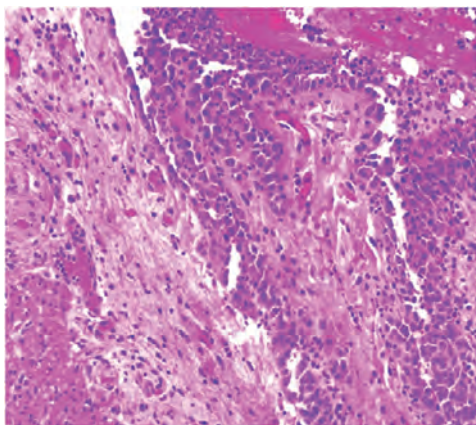


Figure 2B. High-power image to elaborate on the serositis. There are reactive mesothelial cells, and neutrophils, which are the interspersed smaller cells with multilobulated nuclei.

Discussion

Acute appendicitis after liver transplant is rare, and with recent increases in solid organ transplants and improved survival among recipients, patients with acute abdomen owing to appendicitis are expected to increase. The reported incidence of acute appendicitis in liver transplant recipient is 0.01% to 0.49%.²⁻⁵

Typically, the cause of acute appendicitis in nonimmunocompromised patients is multifactorial, with luminal obstruction from fecalith impaction or lymphoid hyperplasia as the main culprit. In liver transplant patients, luminal obstruction, bacteria overgrowth, lymphocytosis, and opportunistic infection owing to *cytomegalovirus* play a major role.^{2,4}

Clinical presentation is similar to non-immunocompromised patients, although most patients have nonspecific gastrointestinal symptoms. Right lower-quadrant pain is the most common symptom²⁻⁵ and may be the only presenting symptom.⁴ Associated symptoms include nausea (88%),²⁻³ vomiting (88%),²⁻³ and fever.²⁻⁵ Owing to the immunosuppression, appendiceal inflammation is minimum, presentation is more atypical, and a high index of suspicion is needed for diagnosis. Common laboratory findings are mostly white blood cells less than 10×10^9 /L and ranges from 2.3 to 26.4×10^9 /L.²⁻⁵ Usually, the results of liver function and biochemical tests are normal.

Abdominal imaging is helpful in ruling out other pathology. Wu and associates recommend routine bedside ultrasound.⁴ Nevertheless, a CT scan, which has a high sensitivity and specificity,⁶ has been used in most studies and is the recommended diagnostic tool of choice.^{2,3,5} Common findings include a nonfilling appendix, appendicolith, and pericecal fat stranding or free fluid.^{3,6}

Management is surgical and open appendectomy is the treatment of choice in most studies.²⁻⁵ Appendectomy is usually performed between 1 and 3 days from the onset of symptoms, and perforation is common after 72 hours.² The hospital length of stay is typically longer and ranges from 1 to 20 days.²⁻⁵

To the best of our knowledge, this case is the only purely laparoscopic appendectomy case ever reported in the English literature. The attractiveness of laparoscopy after organ transplant includes postoperative pain relief, and rapid recovery.⁷ The

feasibility of laparoscopy postliver transplant has been reported in splenectomy,⁸ ventral herniarriophy,⁸ and hysterectomy.¹⁰ Technology is gaining grounds, and more cases are needed to assess its safety and benefit.

Although our patient had limited symptoms with mild leukocytosis, we suspected acute appendicitis, which prompted us to perform a CT scan to confirm our diagnosis and do immediate surgery to avoid complications. Wu and associates reported a 50% negative exploration for appendicitis; nevertheless, other intraoperative findings are equally life-threatening, including bile leak and perforation of duodenal diverticulum and jejunum.⁴

In conclusion, acute appendicitis in liver transplant patient is possible and expected to increase owing to improvements in surgical technique, immunosuppression, and current survival rates after transplant. The clinical presentation is atypical and requires a high degree of suspicion. Confirmation with radiography is advised and mandatory exploration is recommended to rule out other catastrophic diseases. Open appendectomy is common but laparoscopy is feasible in selected cases. There is a high perforation rate; therefore, rapid diagnosis and treatment is recommended.

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