

Living donor liver transplantation in a patient with cocoon abdomen - Anesthesia concerns!

ABSTRACT

Cocoon abdomen is a rare condition in which abdominal structures are surrounded by thick encapsulating peritoneum resulting in dense adhesions. Liver transplant is a high risk surgery with an already increased risk of massive blood loss due to the pre-existing coagulopathy and portal hypertension. Presence of cocoon abdomen with severe dense adhesions can either lead to difficult hepatectomy with massive intra-operative blood loss or failure to proceed with the surgery. This becomes even more important in live donor liver transplantation where it may not be possible to abandon the surgery once the donor liver resection is started. Thus keeping a high suspicion of cocoon abdomen in patients with previous history of kochs abdomen and on long term beta blocker therapy is of utmost importance and this can decrease the morbidity and mortality associated with this condition. A 41 year old male known case of chronic liver disease was posted for live donor liver transplantation. After opening the abdomen thick dense adhesions were found around the intestines and the liver. Due to the dense adhesions surgical team was in dilemma whether to proceed further for the surgery or not. Intra-operatively patient had a blood loss of 12.5 litre. Despite massive transfusion the postoperative course went uneventful and the patient was extubated on 2nd post-operative day. He was shifted out of Intensive care unit on the 6th post-operative day. Cocoon abdomen should be suspected in a chronic liver disease patient with previous history of tuberculosis or on long term beta blocker therapy. Proper preparation before surgery can decrease the morbidity and mortality associated with this major surgery. Our case report clearly shows that such types of patients can be taken up for the live donor liver transplantation surgery with a precaution to start donor hepatectomy only after surgeon has assessed the difficulty status of recipient hepatectomy.

Key words: Cocoon abdomen; living donor; liver transplantation

Introduction

Cocoon abdomen is a rare condition characterized by thick peritoneum encapsulating the abdominal structures with adhesions.^[1] It is also called as sclerosing encapsulating peritonitis. In most cases, it is diagnosed incidentally on laparotomy.^[2] It usually presents clinically as acute or subacute small bowel obstruction.^[3] Liver transplantation is a major surgery which usually requires multiple transfusions.

There are various risk factors predisposing to blood loss such as history of previous abdominal surgery, presence of coagulopathy, presence of multiple collaterals, massive fluid resuscitation, hypothermia, and hypocalcemia. The presence of cocoon abdomen results in multiple adhesions. Moreover, with an increase in the chronicity of liver disease, the number of collaterals increases, which further infiltrates the adhesions present in cocoon abdomen. This causes further

Access this article online	
Website: www.saudija.org	Quick Response Code 
DOI: 10.4103/sja.SJA_655_18	

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Garg N, Sindwani G, Arora MK, Pamecha V. Living donor liver transplantation in a patient with cocoon abdomen – Anesthesia concerns!. Saudi J Anaesth 2019;13:75-7.

NEHA GARG, GAURAV SINDWANI, MAHESH KUMAR ARORA, VINYENDRA PAMECHA¹

Departments of Anesthesia and ¹HPB and Liver Transplantation, Institute of Liver and Biliary Sciences, New Delhi, India

Address for correspondence: Dr. Gaurav Sindwani, Department of Anesthesia, Institute of Liver and Biliary Sciences, New Delhi - 110 070, India. E-mail: drsindwani25@gmail.com

increase in blood loss in an already challenging surgery like liver transplantation and can pose a great challenge for an anesthetist. As per our literature search, the presence of cocoon abdomen also involving liver hilum leading to massive transfusion in a patient undergoing liver transplantation has not been reported. Hence, we present a case of a 41-year-old male patient with history of pulmonary tuberculosis for liver transplantation, incidentally diagnosed to have cocoon abdomen intraoperatively, leading to massive transfusion and dilemma whether to proceed further for the surgery.

Case

A 41-year-old male, weighing 76 kg, diagnosed with ethanol-related chronic liver disease with treated pulmonary tuberculosis was posted for living donor liver transplantation. He had history of pulmonary tuberculosis 6 months ago. The patient also had a history of ascites for which he was on tablet furosemide 80 mg/day and tablet metoprolol 25 mg. He had an Model for End stage Liver Disease (MELD) score of 30. Chest X-ray showed mild pleural effusion of the right side. Bubble contrast ECHO showed moderate shunting with room air PAO₂ of 61 mmHg. On the day of the surgery, the patient was taken inside the operation theater. All standard American Society of Anaesthesiologists (ASA) monitors were attached. An 18-G intravenous cannula was secured in the left upper limb. General anesthesia was induced with inj. propofol 100 mg i.v., inj. fentanyl 100 µg i.v., and inj. rocuronium 100 mg i.v. Trachea was intubated with 8.5 Endotracheal Tube (ETT) and the patient was put on mechanical ventilation. Ultrasound-guided one 8.5-F four-lumen central line and one 9-F triple-lumen advanced vascular access sheath were secured in the right internal jugular vein. Two 20-G arterial cannula were secured, one each in radial artery. Fluid warmer, forced air warmer, and heating mattress were used to maintain normothermia in the patient. Anesthesia was maintained with oxygen and air (50:50), isoflurane, 1.5 µg/kg/h fentanyl infusion, and 0.5 mg/kg/hatracurium infusion. After opening the abdomen, dense adhesions with encapsulation of liver and bowel were found [Figure 1]. Along with this, multiple collaterals in hepatoduodenal ligament, perigastric region, pericholedochal, peri-gall bladder, and perimesentric were also present. This resulted in blood loss of 12.5 L in the dissection phase which was replaced with transfusion of 35 units of Packed Red Blood Cells (PRBCs), 15 units of cryoprecipitate, 15 units of Fresh Frozen Plasma (FFP), and 3 single-donor platelet concentrate; 24 L of plasmalyte and 2.25 L of albumin were also given. Noradrenaline and vasopressin were titrated intraoperatively to maintain a minimum mean arterial pressure of 60 mmHg. Warm ischemia time was 29 min, and the cold ischemia time was 1 h 36 min. The rest of the surgery went uneventful with mild post-reperfusion syndrome which was managed with 400 µg bolus of phenylephrine. The patient

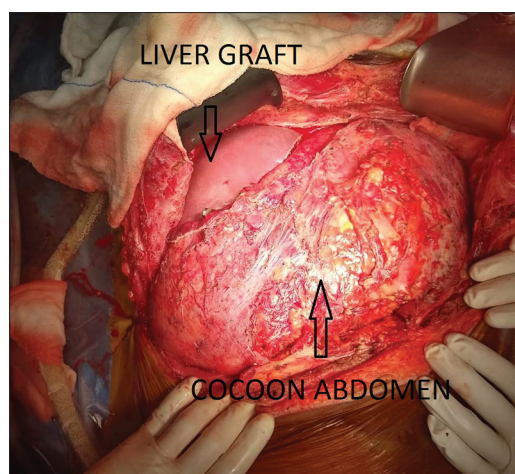


Figure 1: Cocoon abdomen involving whole of the intestines with the liver graft in situ

was shifted to the intensive care unit for elective mechanical ventilation with vasopressor support of noradrenaline 8 µg/min and vasopressin 1 unit/h. The liver functions started improving in the immediate postoperative period indicated by decreasing lactate levels, prothrombin time, International Normalized Ratio (INR), bilirubin, Aspartate Transaminase (AST), and (ALT) Alanine transaminases levels with good portal vein flow and hepatic artery flow on Doppler. The patient was successfully extubated on the second postoperative day despite massive transfusion and shifted out of the intensive care unit on the sixth postoperative day.

Discussion

Cocoon abdomen is a rare condition in which thick fibrotic peritoneum covers the bowel along with adhesions. It is mostly found in females. It is of two types, primary and secondary. Primary is more common and is found in young females, proposed to arise from retrograde menstruation or primary transvaginal peritonitis. Secondary is due to B adrenergic blockers, abdominal tuberculosis, chronic ambulatory peritoneal dialysis, and liver cirrhosis after peritoneal venous shunt.^[4,5]

Preoperative diagnosis is difficult. Clinically, patients present with recurrent intestinal obstruction. Radiologic findings may help in suspected cases. Plain radiograph and oral contrast show a compact mass of bowel with delayed or absent passage of contrast. Ultrasound shows a tightly bound mass of bowel surrounded by a rim of echo poor tissue. Similarly, computed tomography scan can show a circumscribed cluster of small bowel loops.^[6,7] Unfortunately, our patient did not have any of these findings preoperatively which could have lead to preoperative diagnosis of Sclerosing Encapsulating Peritonitis (SEP).

Our patient had ethanol-related chronic liver disease with a previously diagnosed pulmonary tuberculosis which may have been attributed to SEP. The mechanism by which pulmonary tuberculosis can spread to abdomen includes ingestion of infected sputum, through lymphatic channels or through blood vessels. Thus, a high degree of suspicion for abdominal tuberculosis must be kept in mind for patients with pulmonary kochs presenting for liver transplant, and attempts for appropriate diagnosis for cocoon abdomen must be made preoperatively.

Other etiology which might have caused SEP in our patient was the long-term use of metoprolol. Beta blockers which can be associated with the SEP are propranolol, timolol, metoprolol, and atenolol. The mechanism by which beta blockers causes SEP includes enhanced collagen production or an allergic reaction to the drug.^[8]

Cirrhosis results in portal hypertension which leads to the development of collaterals around the liver. In cocoon abdomen, these small collaterals infiltrate the fibrotic tissue which can result in massive blood loss during the surgery. Therefore, probably our patient bled massively despite normal thromboelastography. Preoperative diagnosis and appropriate preparation for cocoon abdomen can help improve the postoperative morbidity and mortality in such patients.

Cocoon abdomen should be suspected in a patient with chronic liver disease with previous history of tuberculosis of any part of the body. Proper preparation before surgery can decrease the morbidity and mortality associated with this major surgery. Our case report clearly showed that such types of patients can be taken up for live donor liver transplantation surgery with a precaution to start donor hepatectomy only after the surgeon has assessed the difficulty status of recipient hepatectomy.

Informed consent

Written informed consent was obtained from the patient.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Rastogi R. Abdominal cocoon secondary to tuberculosis. *Saudi J Gastroenterol* 2008;14:139-41.
2. Wei B, Wei HB, Guo WP, Zheng ZH, Huang Y, Hu BG, *et al.* Diagnosis and treatment of abdominal cocoon: A report of 24 cases. *Am J Surg* 2009;198:348-53.
3. Singh B, Gupta S. Abdominal cocoon: A case series. *Int J Surg* 2013;11:325-8.
4. Debi U, Ravisankar V, Prasad KK. Abdominal tuberculosis of the gastrointestinal tract: Revisited. *World J Gastroenterol* 2014;20:14831-40.
5. Lin CH, Yu JC, Chen TW, Chan DC, Chen CJ, Hsieh CB. Sclerosing encapsulating peritonitis in a liver transplant patient: A case report. *World J Gastroenterol* 2005;11:5412-3.
6. Zaslavsky J, Mulugeta-Gordon L, Vasko I, Presenza T, Scattergood E, Meislich D, *et al.* Tuberculous peritonitis in children: Two case reports highlighting the important role of imaging. *Radiol Case Rep* 2018;13:862-6.
7. Da Rocha EL, Pedrassa BC, Bormann RL. Abdominal tuberculosis: A radiological review with emphasis on computed tomography and magnetic resonance imaging findings. *Radiol Bras* 2015;48:181-91.
8. Noh SH, Ye BD, So H, Kim YS, Suh DJ, Yoon SN. Sclerosing encapsulating peritonitis in a long-term propranolol user. *Intest Res* 2016;14:375-8.