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Successful Surgical Repair of Left-Sided Diaphragmatic Hernia after Adult Orthotopic Liver Transplantation: Case Report

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ABSTRACT

Postoperative delayed diaphragmatic hernia (DH) is a rare and uncommon event after adult orthotopic liver transplantation (OLT), which however could be potentially life-threatening complication, especially in the absence of early and correct diagnosis and appropriate surgical treatment. We present a case of 48 year-old male with left diaphragmatic herniation of left part of transverse colon, who thirty nine months before underwent OLT with right-sided allograft implantation and which was recently successfully managed by open abdominal approach in our institution. The postoperative course was uneventful and he was discharged at the 8th day after surgery. Our case illustrates, that delayed DH after the OLT in adults could be a new problem, which affect transplant recipients with long-term follow-up period. Hence, we consider, that once the diagnosis of DH is confirmed, the patient should be operated immediately, in order to avoid the possible life-threatening complications.

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Introduction

Diaphragmatic hernias (DHs) are a rare and unusual surgical complication after adult and pediatric liver transplant [1-13]. Until today nearly 60 cases of diaphragmatic herniation following liver transplants, being more frequent in child transplants, were reported in English literature [12]. Review of available literature identified only four reported cases of left diaphragmatic herniation with the stomach. Herein, we describe and discuss a case of left-sided DH with herniation of a left part of transverse colon after right lobe live donor liver transplantation in an adult, which has been successfully treated recently in our institution.

Case Report

A 48 year-old male presented to our hospital with complaints of left-sided chest pain, fatigue, dyspepsia, abdominal swelling, fullness and bowel obstruction for 72 hours. Thirty nine months before he underwent right lobe live donor orthotopic liver transplantation (OLT) for end-stage liver cirrhosis due to chronic hepatitis C. Transplantation and post-operative period was uneventful and no injury to the diaphragm was observed during the surgery. It also should be noted, that no history of blunt or penetrating trauma of diaphragm was observed at the follow up period. Chest X-ray and computed tomography (CT) scan revealed left-sided diaphragmatic hernia and a left part of transverse colon was found to be herniated into the thorax (Figure 1). Based on these findings we decided to perform the surgical intervention using open abdominal approach taking into account the previous surgery and the possibility of a pronounced adhesive process in the abdominal cavity. After taking down of adhesions and reposition of left part of colon without the signs of necrosis into the abdominal cavity the diaphragmatic defect with the size of 8x6 cm was identified (Figure 2). The diaphragmatic opening was repaired with non-absorbable polyester "Ethibond" suture into two layers: I layer – S-shaped interrupted sutures and II layer – continuous lock-stitch suture (Figures 3,4).

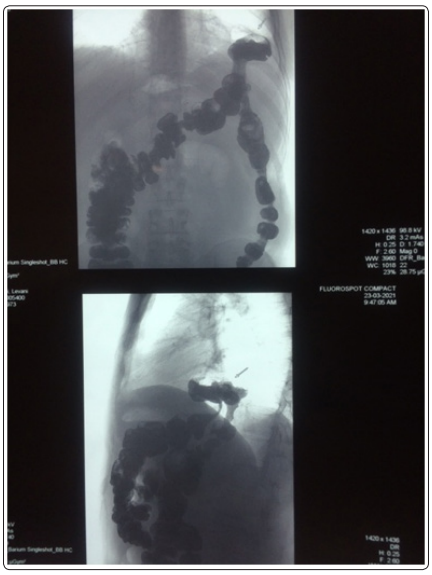

Figure 1: X-ray with transverse colon herniation

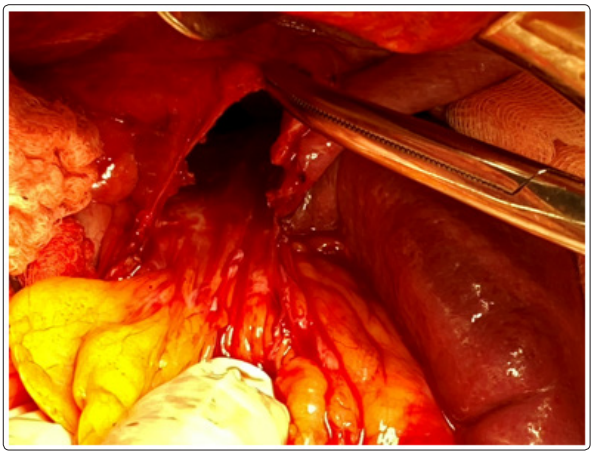

Figure 2: Intraoperative view of diaphragmatic defect

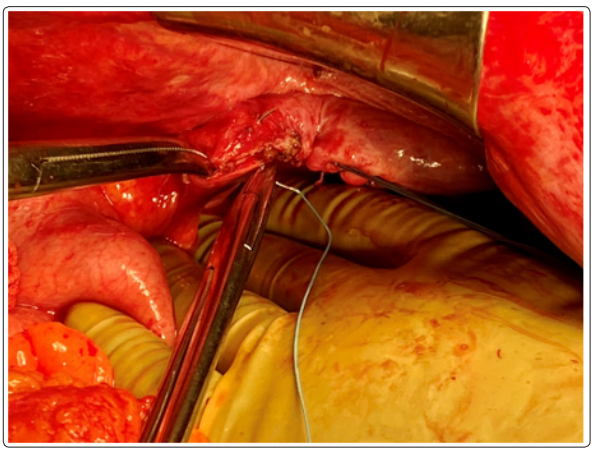

Figure 3: Repair of diaphragmatic defect: I layer sutures

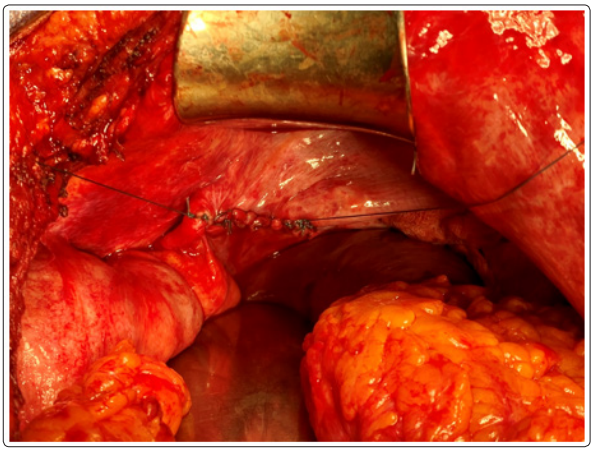

Figure 4: Final view of closed diaphragmatic opening

After that the careful control of hemostasis and drainage of left pleural cavity and left subdiaphragmatic space was performed. Oral feeding and immunosuppressive drugs intake were started at 3-th postoperative day. The postoperative course was uneventful and the patient was discharged at the seventh day after surgery and at the present time is doing well.

Discussion

To the present time the liver transplantation (LT) is a widely used and implemented effective surgical procedure in various irreversible liver diseases with acceptable morbidity and mortality rate and improved survival in most transplant patients. However, this procedure, like any other surgical intervention, is not without its various specific and non-specific complications in the early and long term period and may contribute to significant morbidity and mortality. With the improvement of survival of this group of patients along with the well-known complications, the new problems may arise in the long-term follow-up period that can have a significant impact on the status of transplanted patients [8]. It turns out that one of these complications after liver transplantation may be the delayed diaphragmatic hernia as a result of this procedure. Postoperative delayed DH is a rare and exceptional event after adult OLT, but it could be potentially life-threatening complication, especially in the absence of early diagnosis and appropriate surgical treatment. Waldron et al. to this day reported about 57 cases (including their own 8 cases) of DH mainly with right-sided herniation following pediatric liver transplantation [12]. In the current literature we found only 4 reported cases of left-sided DH after the adult OLT with herniation of the stomach into the thorax [2,3]. In the case presented here, the left part of transverse colon was dislocated into the left thorax without any history of injury of the diaphragm during or after the surgery. There is no consensus among the authors on the real reason for the development of DH after the liver transplantation. Various hypotheses are suggested, dominated by factors associated with surgery (traumatic dissection, excessive use of diathermy, injury to diaphragm, excessive bleeding, intraabdominal hypertension) and the immunosuppressant regimen. Due to the small number of observations, which is especially true for adult patients, it is now very difficult to unequivocally state the real cause of the development of the diaphragmatic hernia. Given this circumstance, we fully agree with Kazimi et al., that the cause of this pathology should be found in a combination of various factors, related to both surgical technique and the patient characteristics [4]. Another debatable question is the choice of approach for the operation. There are proposed and used thoracotomy, laparotomy, combined toraco-laparotomy and thoracoscopic approach. But just like the majority of authors [3-5, 7, 10,) we also have used the open abdominal approach due to a possible massive adhesive process, more comfortable ability to perform if necessary the bowel resection and considering the universality of this access.

As only a few cases of DT after OLT in adults have been reported so far, of course it's too early to draw definitive conclusions, but for clinical alertness it is very important to keep in mind the possibility of developing this complication.

Conclusions

Our case illustrate, that along with well-known complications, delayed DH after the OLT in adults could be a new problem, which affect transplant recipients with long-term follow-up period. Until recently, it was thought that this is a very rare complication, however, there have been reported several cases of DH following adult OLT with increased frequency in the last time. It should be noted also, that this complication is potentially life-threatening condition, especially in the absence of early and correct diagnosis and appropriate surgical treatment. Therefore, we believe that once the diagnosis of DH is confirmed, the patient should be operated immediately, in order to avoid the possible life-threatening complications.

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