

Internal Hernia through Hepatic Falciform Ligament Iatrogenic Defect in a Neonate: A Case Report and Review of the Literature

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Abstract

Internal hernia through an iatrogenic defect in the hepatic falciform ligament and acquired jejunal atresia in a 8-day-old neonate was reported. The PubMed, MEDLINE, CNKI, Wanfang and Weipu databases were searched. The literature about the hepatic falciform ligament iatrogenic defect causing internal hernia was analysed. Ten other cases were collected from the world literature. Herniated intestinal necrosis was found in four cases. All cases were recovered uneventfully after operation. Internal herniation through an iatrogenic defect in the hepatic falciform ligament is extremely rare. However, the case reports are increasing, especially in the era of laparoscopic surgery. Adequate closure or open the defect is essential to prevent internal hernia occurrence.

Keywords: Hepatic falciform ligament, hernia, Iatrogenic defect, internal, laparoscopic surgery

INTRODUCTION

Hepatic falciform ligament originates from the midline of the anterior abdominal wall just above the umbilicus attached to the hepatic diaphragmatic surface.^[1] Iatrogenic defect in the hepatic falciform ligament may lead to the occurrence of internal hernia, though it is rarely reported. It is challenging for surgeons to make an early diagnosis of this rare entity of internal hernia. Delayed diagnosis and management of internal hernia might lead to a life-threatening outcome.^[2] Hereby, we report a neonatal case of internal hernia through an iatrogenic defect in the hepatic falciform ligament and acquired intestinal atresia. The world literature was reviewed.

CASE REPORT

A newborn baby aged 8 days was brought to our department by his parents with bilious vomiting, fever and abdominal distension for 7 days. He underwent a laparotomy on the 1st day of life for congenital gut malformation in another hospital. Physical examination revealed that vital signs were within the normal range. Abdominal distension was noted. Plain erect

abdominal X-ray showed several air–fluid levels in the left upper quadrant and no air in the pelvis, indicating complete intestinal obstruction.

Following admission, nasogastric tube was inserted for gastrointestinal drainage and intravenous fluid therapy was administered. Laparotomy revealed small intestinal obstruction due to internal herniation through an iatrogenic defect in the hepatic falciform ligament. A 10 cm loop of the jejunum herniated through the defect and twisted thoroughly. Acquired jejunal atresia was found. The hepatic falciform ligament was transected to release the obstruction of the bowel. The atretic segment was resected and end-to-end one-layer anastomosis with absorbable suture was performed. The patient recovered uneventfully. There were no complications in the 3-year follow-up period.

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Table 1: Clinical features of the cases

Case	Age	Gender	Abdominal pain		Imaging	Dx	Type of surgery	Hernia content	Status of content
			Location	Onset					
1	8 days	Male	BUQ	7 days	X-rays	SBO	Open	Small bowel	Atretic
2 ^[3]	42 years	Male	BUQ	7 days	X-rays	SBO	Open	Small bowel	Necrotic
3 ^[4]	50 years	Male	RUQ	4 h	X-rays	PU	Laparotomy	Small bowel	Viable
4 ^[5]	52 years	Female	BUQ	1 day	X-rays	SBO	Open	Transverse colon	Necrotic
5 ^[6]	57 years	Female	LUQ	3 days	CT	SBO	Open	Transverse colon	Viable
6 ^[7]	58 years	Female	BUQ	1 day	X-rays	IH	Laparotomy	Small bowel	Viable
7 ^[8]	62 years	Female	BUQ	20 h	CT/X-rays	SBO	Laparotomy	Small bowel	Necrotic
8 ^[9]	65 years	Female	BUQ	1 day	X-rays	IH	Laparotomy	Small bowel	Viable
9 ^[10]	78 years	Male	BUQ	5 h	CT	IH	Laparotomy	Small bowel	Necrotic
10 ^[11]	67 years	Male	BUQ	4 h	CT	SBO	Laparotomy	Small bowel	Viable
11 ^[12]	85 years	Male	RUQ	2 days	CT	SBO	Open	Small bowel	Viable

RUQ: Right upper quadrant, LUQ: Left upper quadrant, BUQ: Both upper quadrants; Dx: Diagnosis, PU: Perforated ulcer, SBO: Small bowel obstruction, IH: Internal hernia, CT: Computed tomography

Literature review

Literature about internal hernia caused by iatrogenic defect of hepatic falciform ligament till 1 October 2019 was searched. The PubMed, MEDLINE, CNKI, Wanfang and Weipu databases were searched using keywords ‘hepatic falciform ligament, internal hernia’. A total of 11 cases were included from the literature in this study, and the clinical features, diagnosis, management and outcome of the cases are re summarised in Table 1.

Case analysis

Ten cases from literature and the present case of internal hernia through iatrogenic defect of the hepatic falciform ligament were analysed. There were 6 males and 5 females. Ten cases were diagnosed with intestinal obstruction or internal hernia and one case was diagnosed as perforated peptic ulcer. There were two cases having a history of previous open surgery and nine cases having a history of previous laparoscopic surgery. All cases underwent operative management, including laparoscopic surgery in 6 cases and open surgery in 5 cases. The operative findings showed herniation of the small intestine in 9 cases and transverse colon in 2 cases, including herniated bowel necrosis in 4 cases and atresia in 1 case.

DISCUSSION

Internal hernia of small bowel and colon through a defect in hepatic falciform ligament is rare. The first paediatric case of intestinal internal hernia through hepatic falciform ligament defect was reported in 1937 by Schutz and Ziegler.^[13] The defect may be congenital or acquired. Acquired or iatrogenic defect is mainly due to operation, especially in the era of the laparoscopic surgery. There were several reports about iatrogenic hepatic falciform ligament defect caused by trocar placement during cholecystectomy and fundoplication.^[8,10,12] The case hereby reported is a newborn baby who underwent open surgery and left an iatrogenic defect in the hepatic falciform ligament. Internal hernia occurred in a few days following the initial operation.

Internal hernia through defect of the hepatic falciform ligament presents no specific clinical manifestations. Radiology has an important role in the diagnosis of internal herniations.^[14] Abdominal computed tomography (CT) scanning in herniation through falciform ligament defect may show a cluster of small intestine below the diaphragm, in front and above the hepatic.^[8,12] In the present case, the internal hernia through hepatic falciform ligament defect was diagnosed intraoperatively and acquired jejunal atresia was found. From the data,^[3,5,8,11] operative findings showed that the herniated bowel segment was necrotic in 4/11 cases.

The outcome is associated with early diagnosis and appropriate management.^[14] Patients with symptoms and signs of intestinal obstruction after laparoscopic cholecystectomy and gastric fundoplication should pay much attention to the differential diagnosis of internal hernia.^[8,10] If the diagnosis of intestinal obstruction was made, early laparoscopic surgery might be a choice.

CONCLUSION

In the era of laparoscopic surgery, especially in laparoscopic cholecystectomy or fundoplication, internal hernia due to iatrogenic hepatic falciform ligament defect may be one of the serious complications. It is crucial to close or open the defect so as to avoid the occurrence of internal hernia.

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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.

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Conflicts of interest

There are no conflicts of interest.

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