

Rupture of the spleen following thoracoscopic spine surgery in a patient with chronic pancreatitis

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Abstract

Purpose To highlight the perioperative risk of intracapsular haematoma of the spleen or splenic ruptures during thoracoscopic spine surgery in patients with chronic pancreatitis.

Methods A 38-year-old patient with an L1 burst fracture (AO A3.3) underwent a standard thoracoscopic corpectomy and replacement of the vertebral body with an extendable vertebral body replacement 10 days after posterior instrumentation of T12–L2. In patients history chronic abusive alcoholism with related diseases such as pancreatitis, followed by hemipancreatectomy was found. Six hours after the surgery, the patient became hemodynamically unstable. An emergency CT scan revealed a splenic rupture. Emergent splenectomy was performed.

Results After surgical treatment of the L1 burst fracture, a rupture of the spleen was detected. An immediate splenectomy was performed. At the 18-month follow-up, an unchanged stable position of the cage was observed on CT.

Conclusions Due to its proximity to the thoracolumbar junction, the spleen is vulnerable to injury during spine surgery. If the patient has undergone previous intra-abdominal operations or chronic inflammation of the pancreas is found, special care of the spleen during the operation is necessary.

Keywords Splenic rupture · Thoracoscopy · Spinal fracture · VBR · Pancreatitis

Introduction

Video-assisted thoracoscopic (VATS) instrumentation of the thoracic and thoracolumbar spine is a well-known method for treating fractures of the spine. Previously reported intra- and postoperative complications include intercostal neuralgia, tension pneumothorax, hemothorax, and injuries of the lung and the vessels [1–5]. Due to its proximity to the thoracolumbar junction, the spleen is vulnerable to injury during thoracoscopic spine surgery. Overall, few reports of intraoperative injury of the spleen exist, with most described during colonoscopy and gastroscopy. To the best of our knowledge, only one case of splenic rupture following thoracoscopic anterior spine surgery is reported [6]. In this case, the authors describe an obese patient with a pathologic T12; the spleen was injured intraoperatively during incision of the diaphragm at its attachment.

History

A 38-year-old man (height 1.78 m, weight 65 kg, BMI 20.5) was brought to our level 1 trauma center with pain in the thoracolumbar region. Detailed information about the accident and circumstances could not be remembered by the patient due to alcohol intoxication. A CT scan showed an AO A3.3-burst fracture of the L1 (Fig. 1); an initial splenic injury was excluded. The patient had a history of chronic abusive alcoholism with related diseases such as pancreatitis, chronic gastritis, duodenitis and steatosis hepatitis

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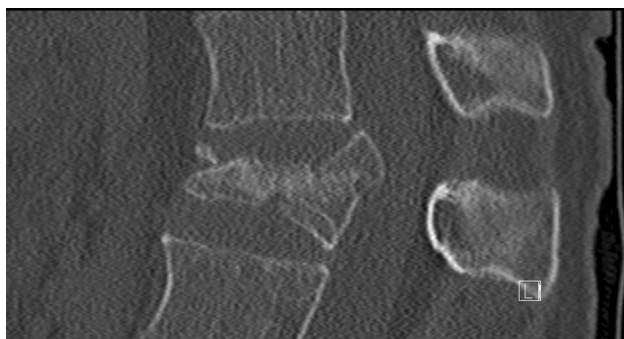


Fig. 1 The CT scan showed an AO A3.3-burst fracture of the L1

without splenomegaly. Two years ago, a hemipancreatectomy was performed without further complications.

Surgical procedure

On the day of hospital admission, posterior instrumentation of T12–L2 was conducted. Scheduled VATS with partial corpectomy, implantation of a VBR (Hydrolift, Braun Aesculap), and anterior instrumented fusion (MACS, Braun Aesculap) were conducted 10 days later. Thoracoscopy was performed through a standard left-side approach without any problems. Intraoperative images revealed good visualization in the slim patient. The diaphragm was retracted with a soft paddle (Endo Paddle Retract, Covidien), and the operation site was exposed sufficiently. No excessive force to retract the diaphragm during surgery was necessary. Partial corpectomy of the L1 was undertaken. Anterior spondylodesis was conducted using a VBR (Hydrolift) and autologous bone, followed by instrumentation with an angle-stable plate (MACS) with polyaxial screws (Fig. 2). The operation time was 157 min, and the intraoperative blood loss was 300 ml. No signs of



Fig. 2 CT scan after implantation of a VBR and instrumentation with an angle-stable plate



Fig. 3 Intracapsular hematoma of the spleen



Fig. 4 Intracapsular hematoma of the spleen

hemodynamic instability or excessive bleeding were observed intraoperatively at any time.

Six hours later suddenly, the patient got progressively hemodynamic unstable (pulse rate of 130 per min, blood pressure of 90/60 mmHg) with a decline of hemoglobin from 11.4 g/dl postoperatively to 8.4 g/dl. Immediately, an abdominal CTA was performed. A large intracapsular hematoma of the spleen and minimal hemoperitoneum (Figs. 3, 4) were found, and thus, immediate splenectomy was performed. During the operation, massive hemoperitoneum was observed, and the rupture of the spleen was found to have completed. No sign of injury to the diaphragm was found during surgery.

After splenectomy, the patient recovered rapidly. Postoperatively, 4 erythrocyte concentrates were administered. The patient was discharged from hospital 10 days after splenectomy.

Four weeks after splenectomy, the patient presented signs of systemic infection. A CT scan of the thorax identified a pleural empyema. After an attempt to drain the empyema, decortication with an intrathoracic application of VAC-Seal was necessary.

Antibiotic prophylaxis was performed for 8 weeks. The implant was left in place. At the 18-month follow-up after the primary surgery, the implant showed an unchanged, stable position.

Discussion

Most of the presented cases in the literature of intra- or postoperative splenic ruptures were found after endoscopic surgery, including colonoscopy [7, 8]. Morrisson and Jacobs [9] reported a lesion of the spleen after laparoscopic Nissen fundoplication using a harmonic scalpel. The pathomechanism of this injury was unclear.

Splenic ruptures after anterior spine surgery have primarily been described in literature during open spine surgery. Heyworth et al. [10] reported a lesion of the spleen after using a thoracoabdominal approach. The mechanism of injury was reported as follows: “traction on the spleen or its adjacent viscera caused avulsion of one of the vessels in the suspensory ligaments of the spleen”. Similar cases have been reported by Hodge and Sin [11, 12]. The same pathomechanism leading to injury was suspected.

There is only one report by Binning et al. [6] describing splenic rupture following thoracoscopic spine surgery. In this case, a man with massive obesity (360 lbs) was treated operatively. The diaphragm was incised, and a retractor was used for visualization. In this situation, it is clear that a higher pressure to the diaphragm would have been necessary during the operation.

In our case, a young patient with a physical state, perfect for thoracoscopic spine surgery was treated. The patient's past medical history revealed alcohol abuse and chronic pancreatitis followed by hemipaneurectomy. Although there was no indication of splenomegaly in the preoperative CT-scan the spleen seemed to be more vulnerable. In literature, several reports of atraumatic haematoma and even spontaneous ruptures of the spleen following acute or chronic pancreatitis are reported [13–16].

The suspected pathomechanism seems to be an extension of the inflammatory process from the pancreatic tail into the splenic hilum and perisplenitis [17].

Malka et al. evaluated 500 consecutive patients with proven chronic pancreatitis prospectively for a mean of 7.0 years. In this large series a rate of atraumatic splenic ruptures and intracapsular haematoma of 1.2 % was found [18].

Conclusions

Intraoperative iatrogenic injuries of the spleen during thoracoscopic spine surgery are rare complications.

Although using a large, soft paddle without any hard edges to retract the diaphragm, splenic rupture occurred. In patients with chronic pancreatitis the spleen seems to be more vulnerable. Therefore, in thoracoscopic instrumentation of the TL spine, splenic injury may occur more easily than in healthy people. This has to be discussed with the patient.

Conflict of interest The authors declare that they have no conflict of interest.

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