Advances in surgical technology and our understanding of the anterior approach for decompression and fusion for thoracolumbar spinal disease due to trauma, tumor, degenerative disorders, infection, and deformity have provided surgeons with a higher comfort level in treating patients with these pathological entities. A larger number of cases are being treated; consequently, there are reported instances of intra- and postoperative complications directly related to this procedure.

The spleen’s proximity to the surgical field for the thoracolumbar junction makes it vulnerable to injury during this type of surgery; however, only a few cases of splenic injury have been reported in the literature. After 2 days, the patient in the present case required an emergency splenectomy for an iatrogenic Grade IV spleen laceration (Table 1) following anterior T12–L3 fusion with instrumentation.

Case Report

History and Examination. This 52-year-old man from the Veterans Administration hospital initially presented for an inpatient consultation for a chronic methicillin-resistant Staphylococcus aureus infection with severe L1–2 discitis. He exhibited no neurological deficits and opted to receive treatment consisting of intravenous antibiotics and a rigid external brace for 6 weeks. His outpatient follow-up included multiple x-ray films of the lumbar spine and sequential neurological examinations. An MR image of the lumbar spine was repeated to assess his response to medical therapy. A sagittal T1-weighted MR image with contrast enhancement showed severe discitis at the L1–2 disc space and epidural extension, which is associated with kyphotic deformity (Fig. 1A). More than 50% of his spinal canal was compromised (Fig. 1B). He could exert full strength in dorsiflexion and plantar extension for only a short period of time because of severe pain generated through movement; surgical decompression and fusion with instrumentation

Abbreviations used in this paper: CT = computed tomography; MR = magnetic resonance.
via an anterior thoracolumbar approach was offered in the hope of reducing the pain.

**Operation.** A standard surgical procedure for a left-sided thoracoabdominal approach was performed without much difficulty by personnel in the cardiothoracic surgery service. Large retractor blades were used to keep the operative field free of obstruction. Although the retractors were adjusted multiple times, no excessive force was used to retract at any point during surgery. Generous corpectomies were undertaken at L-1 and L-2 to decompress the spinal canal. After filling in the vertebral defect with a pyramesh cage and autograft bone, instrumentation consisting of four screws and two rods was placed. The general surgeons noticed a small laceration on the patient’s spleen during closure, but believed that it was unnecessary to repair it because there was no sign of active bleeding at that time. Estimated intraoperative blood loss was approximately 2500 ml, and blood was replaced via autotransfusion using a cell-saver machine.

**Postoperative Course.** The patient was monitored in the intensive care unit postoperatively. A CT scan of the thoracolumbar spine was obtained on postoperative Day 1 to assess placement of the instrumentation. Compared with the findings on initial MR imaging, the kyphosis had improved and all instrumentation was in good position. He remained hemodynamically stable until postoperative Day 2 when he became hypotensive with declining hematocrits on serial tests. Despite transfusing 13 units of packed red blood cells, his condition became unstable and his abdomen became rigid. Emergency CT scanning of the abdomen showed a Grade IV splenic laceration (Table 1), and the patient was rushed back to the operating room for a splenectomy (Fig. 2). His spleen was transected from the hilum, with a large amount of clotted blood surrounding the area. He recovered rapidly without any further problems and was transferred to an inpatient rehabilitation unit at the Veterans Administration hospital.

**Discussion**

Complication rates for all types of events, including urinary tract infection, have been reported in the literature; the reported complication rate for the thoracolumbar approach has been as high as 34%. Pulmonary problems with infection and emboli from deep venous thrombosis are most common during recovery in the hospital. Direct vascular injuries are rarely reported in the literature, and direct visualization of the aorta on a left lateral approach offers some protection against potential injury. A case of delayed vascular injury can occur, but appropriate diagnostic studies followed by immediate intervention can save a person’s life.

The proximity of the ureter and femoral nerve in this region can mean vulnerability to retraction injury as well as vascular injury. Large metal blades attached to a Bookwalter retractor system are routinely used during the thoracolumbar approach to keep the iliopsoas muscles and other vital organs out of the surgical exposure. Constantly applied mechanical pressure can indeed compromise function. Although the metal retractor blades are always covered with cotton sponges when placed against visceral organs, a limited amount of force should be applied to

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**TABLE 1**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>subcapsular hematoma of &lt;10% of surface area</td>
</tr>
<tr>
<td>II</td>
<td>subcapsular hematoma of 10–50% of surface area</td>
</tr>
<tr>
<td>III</td>
<td>subcapsular hematoma of &gt;50% of surface area or expanding &amp; ruptured subcapsular or parenchymal hematoma</td>
</tr>
<tr>
<td>IV</td>
<td>laceration involving segmental or hilar vessels with devascularization of &gt;25% of spleen</td>
</tr>
<tr>
<td>V</td>
<td>shattered spleen or hilar vascular injury</td>
</tr>
</tbody>
</table>

* Created by the Organ Injury Scaling Committee of the American Association for the Surgery of Trauma.
achieve adequate exposure to minimize possible injuries due to excessive retraction.

There have been two other case reports of splenic injury during a spinal surgery in the thoracolumbar region.iii,iv Splenic laceration in the present case could have occurred because of the extended retraction time with metal blades to enhance the surgical field. The patient’s chronic infection may have contributed to possible splenomegaly, which can potentially increase the chance of splenic injury due to an increase in the size of the spleen. There was no indication of splenomegaly preoperatively; however, there was no CT scan of the patient’s abdomen, and we have no evidence of splenomegaly prior to his spinal operation. Although the general surgeons noted a small laceration intraoperatively, it did not cause profuse bleeding and they decided against splenectomy at that time. A slow subcapsular hematoma could have led to avulsion from the hilum (Fig. 3) and destabilized the patient’s condition. A CT scan of the abdomen could have been obtained sooner, before giving 13 units of packed red blood cells, given that the splenic injury was noted during the initial surgery. When a patient becomes hemodynamically unstable following thoracolumbar surgery, a potential intraabdominal injury must be ruled out. Ultimately, the patient fared well without permanent sequelae.

Conclusions

Splenic injury is a rare complication of anterior thoracolumbar spinal surgery. When a patient becomes hemodynamically unstable postoperatively, splenic laceration may be the cause, as it clearly was in the featured case.

References


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