Archives of Clinical & Experimental Surgery

Case Report
Arch Clin Exp Surg 2015;4:222-225
doi:10.5455/aces.20130906062431

Small bowel transection as a rare complication of lumbar disc surgery: Report of a case

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ABSTRACT

Small bowel injury resulting from the perforation of anterior longitudinal ligament during lumbar disc surgery is very rare, with prompt diagnosis being difficult. In the present study, we present a case of intestinal transection and discuss technical methods to prevent this complication with a review of literature. A 34-year-old woman, who had a history of lumbar disc surgery one day before, presented with abdominal pain. On physical examination, rebound tenderness and muscular rigidity were obtained, with emergency abdominal computed tomography confirming the diagnosis of perforation by showing free air and free fluid. The patient underwent laparoscopic exploration; the small bowel was found transected 60 cm proximally to the ileocecal valve. Since there were no signs of generalized peritonitis, the abdomen was irrigated with sterile saline, and side-to-side ileal anastomosis was performed. Her postoperative course was uneventful and she was discharged on the postoperative fifth day. Although bowel perforation after discectomy rarely occurs, it might be very fatal unless a prompt diagnosis is achieved. Especially, an early postoperative course can mask the symptoms and signs. Therefore, general surgeons should be aware of such a complication after lumbar disc surgery, and spine surgeons must be more cautious while they are using retractors in the intervertebral space.

Key words: *Lumbar disc surgery, intraabdominal complication, bowel perforation, discectomy*

Introduction

Intra-abdominal complications during lumbar disc surgery (LDS) occur in 0.016–0.06% of cases, with retroperitoneal vascular injuries constituting the majority of these complications [1]. Intestinal injury is a very rare complication of LDS, and our literature search revealed 17 previous cases [1,2]. To our knowledge, our case is the first case presenting with complete bowel transection (grade 4) due to LDS.

We aimed to highlight this rare but life-threatening complication and discuss technical methods to prevent this complication.

Case Report

A 34-year-old woman with a history of chronic low back pain had the diagnosis of L5-S1 disc herniation and she underwent microdiscectomy in the neurosurgery department. On postoperative day 1, the patient complained of severe abdominal pain. We, the general surgeons, were called in for a consultation. Her vital signs were within normal limits (arterial blood pressure: 110/80 mmHg, heart rate: 78 beats/min) and she was afebrile. On physical examination, she had an acute abdomen with guarding and rebound tenderness. Computed tomography demonstrated a large vol-

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Received / Accepted : *August 18, 2013 / September 06, 2013*

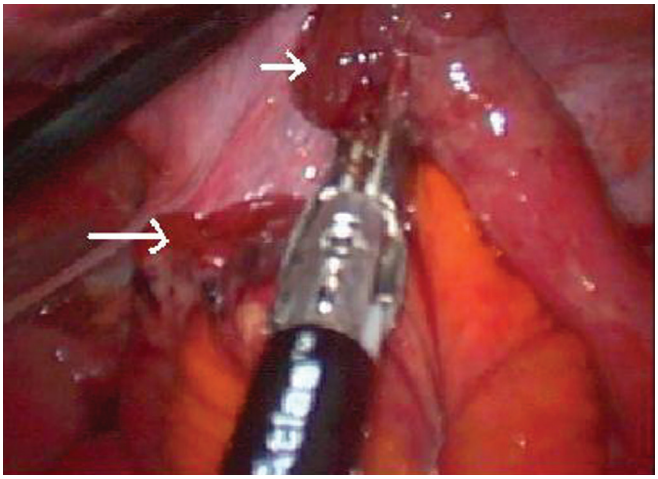

Figure 1. Complete transection of the small bowel was seen in laparoscopic exploration. The arrows show the proximal and distal end of the bowel segment.

ume of free fluid and free air in the abdominal cavity. The patient was taken to the operating theater, where laparoscopic exploration was performed. Upon entry into the peritoneum, a large volume of succuss entericus was detected. Intraabdominal solid organs and the colon were found to be intact in their entirety. Further examination revealed intestinal injury in the small bowel, 60 cm proximally to the ileocecal valve, lying in an area close to the retroperitoneum and adjacent to the sacrum (Figure 1). The small bowel was found to be totally transected. The abdomen was irrigated with sterile saline, and since there was no sign of generalized peritonitis, side-to-side ileal anastomosis was performed. The patient's postoperative course was uneventful and she was discharged on the postoperative fifth day.

Discussion

Although the anterior longitudinal ligament and annulus fibrosus might be considered a barrier sufficient to prevent inadvertent penetration during lumbar disc surgery, vascular and intestinal injury are recognized as rare but potentially life-threatening complications. Retroperitoneal vascular injury is the most frequently seen intraabdominal complication during LDS, followed by others such as bowel perforations or ureteral lesions [3-5]. Also, arteriovenous fistulae and pseudoaneurysms may rarely occur during disc surgery and they have high mortality and morbidity rates, so early diagnosis and treatment of vascular complications associated with disc surgery are essential [6].

Our literature search revealed 17 cases of intraabdominal lesions during LDS (Table 1), of which 12 had small bowel perforation [7-9]. The ileum was the most frequently injured bowel segment, followed by sigmoid colon, caecum and jejunum [10,11].

Regarding the mechanism of this injury, we speculate that the bowel segment was compressed in the intervertebral space as a result of the perforation of the anterior longitudinal ligament (ALL); possibly, the prone position of the patient and the retractors facilitated perforation by increasing the pressure on the bowel segment. It has been thought that these kinds of injuries could be decreased by more common use of microsurgery, but it was understood that microsurgery did not decrease the risk of injury, since five patients undergoing microdiscectomy had the same complications.

Although major vascular injury may present with hypotension and/or bleeding from the disc space intraoperatively, the clinics of visceral injury may be obscure. Generally, the injury remains unnoticed in the intraoperative period, and signs and symptoms may appear hours or days later. Abdominal pain is the dominant symptom in case of intestinal perforation. The indistinct symptoms in the early postoperative hours may cause a delay in the diagnosis. Especially, use of narcotic analgesics in the postoperative period can mask a patient's symptoms. In addition, non-specific symptoms such as nausea and vomiting can easily be interpreted to be the side effects of anesthetic agents. Existence of guarding and rebound tenderness on physical examination should alert the physician. Plain abdominal X-ray and, especially, CT can help diagnosis by demonstrating free air in the abdominal cavity. In the present case, the patient reported abdominal pain one day after surgery; on physical examination, she had an acute abdomen with guarding and rebound tenderness. And abdominal CT confirmed the diagnosis by showing free air and fluid. By achieving early diagnosis, since there were no signs of peritonitis, the patient had the chance of being operated laparoscopically, and she was discharged without sequelae on the postoperative fifth day. In the literature, several cases resulting in intra-abdominal abscess, sepsis or death due to delayed diagnosis have been reported [12]. Therefore, close monitoring, frequent physical examination and CT are warranted in such cases to manage early diagnosis and treatment.

Table 1. Reports of bowel perforations after lumbar disc surgery.

Year, Reference	Sex; Age (y)	Level	Spine surgery technique	Radiological procedure, diagnosis	Site of perforation	Death
1954, Harbison	?	L4-5	?	?	Small bowel	No
1964, Smith RA et al.	Woman; 52	L5-S1	Laminectomy	X-ray, not reported	Ileum and retroperitoneum	No
1970, Birkeland IW et al	3 Men, 1 Woman, age not reported	L5-S1; 3 cases, L4-5	Discectomy	Not reported	Appendix and ileum	Not reported
1981, Shaw ED et al.	Men; 35	L5-S1	Discectomy	Not reported	Ileum	No
1989, Schwartz AM et al.	Woman;17	L4-5	Microscopic Discectomy	Not reported	Sigmoid colon	Not reported
1991, Smith EB et al.	Woman;50 Man; 40	L5-S1	Discectomy	Not reported	Ileum	Not reported
1992, Pappas CT et al.	Age, sex not reported	Not reported	Not reported	Not reported	Small bowel	No
2001, Hoff-Olsen P	Man, age not reported	L5-S1	Microscopic Discectomy	X ray, pneumoperitoneum	Ileum and retroperitoneum	Yes
2004, Houten JK et al	Woman;44	L5-S1	Microscopic Discectomy	Abdominal CT	Jejunum and retroperitoneum	No
2004, Bilbao G et al	Man;36	L5-S1	Discectomy	Abdominal CT	Ileum	No
2009, Hollegaard S et al.	Man;47	Not reported	Discectomy	Abdominal CT	Ileum	No
2010, Kim DS et al	Man;47	L5-S1	Microscopic Discectomy	Abdominal CT, pneumoperitoneum	Jejunum	No
2011, Cases-Baldo MJ et al	Woman;36	L5-S1	Discectomy	Abdominal CT, Hemoperitoneum	Rektosigmoid junction	No
Our case	Woman;32	L5-S1	Microscopic Discectomy	Abdominal CT, Pneumoperitoneum	Ileum, complete transection	No

CT: Computed Tomography

Conclusion

Although intestinal injury during LDS is very rare, it is a life-threatening complication, especially in delayed cases. Via a case, we aimed to attract the attention of spine surgeons to the potential intraabdominal complications and to highlight the importance of being more careful in using retractors. General surgeons must consider the presence of such a complication when there are signs and symptoms of a postoperative acute abdomen. To achieve early diagnosis, dynamic follow-up, repeated physical examinations and CT are very important.

Conflict of interest

The authors have no conflicts of interest to declare.

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