

Abdominal Aorta Injury due to Lumbar Disc Hernia Operation: A Case Report

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Abstract

During lumbar disc hernia operations, large intra-abdominal injuries may develop, even though they are rare. Massive bleeding and hypotension are precursors of this complication, which often has a mortal prognosis. In this circumstance, emergent operation should be performed by laparotomy. We present a case in whom an abdominal aortic injury developed during lumbar disc surgery. (*JAEM* 2014; 13: 149-50)

Key words: Lumbar disc hernia operation, abdominal aorta injury, massive bleeding

Introduction

Low back pain is the second most frequent disease causing labor loss in society, following respiratory tract infections (1). One of the most common reasons behind low back pain is lumbar disc hernia (2). Today, the most common intervention in brain surgery practice is the operation of discectomy for lumbar disc hernia (3). Abdominal vascular injuries may develop following lumbar disc surgery (4). This complication is rare; however, it has a high rate of mortality once it develops (5, 6). Vascular complications following lumbar disc surgery can be divided into two groups: early ones, such as massive hemorrhage and retroperitoneal hematoma, and late ones such as arterio-venous fistula and pseudoaneurysm (7, 8). The pattern of hypovolemic shock in the early post-operative period should initially prompt the surgeon to consider a large vessel injury. The urgent laparotomy to be performed in this case is of vital significance (5, 6, 8-10).

This case report presents a case in whom an abdominal aortic injury developed during lumbar disc surgery.

Case Presentation

A 35-year-old female patient presented to the department of physical therapy and rehabilitation clinic of a private hospital due to a symptom of pain that had been present for 1 year in the low back and right leg. After the physical examination, the patient was sent

to the brain surgery department of our hospital. In the physical examination, it was identified that the result of the straight leg raise test was positive at 55 degrees, the dorsiflexion muscle strength of right leg was: 4/5, deep tendon reflexes on the right were hypoactive, and the sole skin reflex was bilaterally negative, and she had hypoesthesia in the right S1 dermatome. The results of the PA pulmonary X-ray, electrocardiography, hemogram, and biochemical analyses were assessed to be within normal limits. In the lumbar MRI imaging, a disc herniation that was para-median at the level of L5-S1, which impinged on the root of the right S1, was observed. The patient was admitted to the brain surgery department clinic for operation. The patient was scheduled for right L5 hemilaminectomy, right S1 foraminotomy, and L5-S1 discectomy surgery under general anesthesia, in line with conventional discectomy surgery. Since excessive hemorrhage, hypotension, and tachycardia developed in the phase of surgical exploration, a large vessel injury was suspected. Urgently, blood and blood product transfusion was started, and the cardiovascular surgery department was consulted. We decided to perform an urgent laparotomy. For this purpose, the surgical site was rapidly closed, and the patient was moved to the supine position. Rapid fluid replacement was performed on the patient by opening a central path through the right internal jugular vein. Invasive artery monitoring was ensured. During the urgent laparotomy, the retroperitoneum was rapidly accessed, following the exclusion of intestines, and an extensive hematoma and blood were observed. In the meantime,

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the arterial blood pressure was 60/20 mm Hg, pulse rate was 143/min, and hemoglobin value was 5.1 g/dL. The hematoma was rapidly drained, and the site of injury on the posterior wall of the abdominal aorta was identified. A perforation of about nearly 2 cm was seen. Bleeding control was ensured via the exertion of direct pressure on the defect. Accompanied by the pressure exerted proximally and distally on the perforation site, a primary repair was completed using 4/0 polypropylene suture material (4/0 polypropylene suture; Dogsan, Istanbul, Turkey). The retroperitoneum was closed, and the operation was ended after the bleeding was taken under control. The patient received nearly 4 units of red blood cell suspension, 2 units of fresh whole blood, and approximately 4 liters of crystalloid during surgery. The patient was extubated on the same day in the intensive care unit, and the vital signs on the first day were stable; hence, the patient was admitted to the service. The patient was observed to have no problems during the follow-up period; she received early period low-molecular-weight heparin treatment. After 7 days, the right L5 hemilaminectomy, right S1 foraminotomy, and L5-S1 discectomy surgeries were performed as previously planned. Following the disc surgery, post-operatively after 5 days, the patient was discharged, and no problems were seen during the follow-up in the first month.

Discussion

Major vascular injury following lumbar disc surgery is rare (0.016%-0.17%); however, it has a high mortality rate of 15%-61% when it develops (5, 6). Vascular injuries occur most often (75%) at the level of the fourth or fifth lumbar vertebra (5, 6, 8, 11). The reason is that the disc surgery is performed more often in this range and that these vessels are relatively immobile, as they are closely attached to vessels (5, 8). The prone position of the patient causes the vasculature to become closer to the vertebral column. Bingöl et al. reported the left main iliac artery as the most frequently injured vascular structure, with a rate of 76.9% in their study (5).

The development of unexplainable massive bleeding in the surgical site, hypotension, tachycardia, and shock should trigger the surgical team that there may be a major vascular injury (5, 8, 12). In such a situation, the possible reasons, such as cardiogenic shock related to myocardial infarction, should rapidly be reviewed; the operation should be immediately stopped when there is suspicion of a vascular injury, and the patient should be moved to the supine position (5, 8, 10). A wide-lumen central catheter, invasive artery monitorization, and urinary catheter should be applied to the patient, and the vascular surgery team should be informed. A laparotomy must be performed as soon as possible (5, 8-11). Conducting analyses due to the worry that there might be a negative exploration causes loss of time, and it is not recommended (5, 8, 9).

The surgical approach should be trans-peritoneal instead of retroperitoneal, in that it provides ease in identifying the origin of the hemorrhage and taking it under control. Protecting the patient against hypothermia, which may be due to exploration in the prolonged surgical process and the massive fluid replacement, is an important factor that may enhance surgical success. Depending on the injured vascular structure and the presence of a defect, the procedures of repair with a primary or autogenous vein or Dacron patch, graft interposition, or ligation may be performed. We believe that it may be advantageous to prefer primary repair with priority, if possible.

Among the complications that may emerge in the late period are the development of arterio-venous fistula and pseudo-aneurysm, as reported by Erdogan et al., and pseudo-aneurysm, albeit rare, as reported by Nisanoglu et al. (7, 8).

Conclusion

We believe that there may be an increase in the number of cases where abdominal vascular injuries that are rare, yet fatal, develop in parallel with operations for disc hernia, which have become common today thanks to sophisticated imaging methods and healthcare services, and that neurosurgeons as well as vascular surgeons need to be more prepared for such situations.

Informed Consent: Written informed consent was obtained from the patient who participated in this study.

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References

- Rowe ML. Low back pain in industry: a position paper. *J Occup Med* 1969; 11: 161-9. [\[CrossRef\]](#)
- Nachemson AL. The lumbar spine: an orthopedic challenge. *Spine* 1976; 1: 9-71. [\[CrossRef\]](#)
- Zileli M, Gülman V. Lomber disk hernisinde yakınma ve bulgular. Zileli M, Özer AF. Omurluk ve Omurga Cerrahisi. Meta Basım, İzmir 2002; 1: 635-46.
- Ünlü Y, Ceviz M. Periferik Damar Yaralanmaları. Duran E. Kalp ve Damar Cerrahisi. Çapa Tıp Kitabevi, İstanbul 2004; 1: 799-814.
- Binöl H, Cingöz F, Yılmaz AT, Yasar M, Tatar. Vascular complications related to lumbar disc surgery. *J Neuro surg (Spine 3)* 2004; 100: 249-53. [\[CrossRef\]](#)
- Torun F, Tuna H, Deda H. Abdominal vascular injury during lumbar disc surgery: report of three cases. *Ulus Travma Acil Cerrahi Derg* 2007; 13: 165-7.
- Erdoğan HB, Erentuğ V, Ömeroğlu, SN Bozbuğa NU, Kırallı K, Esat Akıncı E, et al. Spinal disk operasyonu sonrası gelişen iliak arteri venöz fistülün 2 yıl sonra onarımı: olgu sunumu. *Turkish J Thorac Cardiovasc Surg* 2003; 1: 60-2.
- Nisanoğlu V, Erdil N, Işık B, Cihan HB, Battaloğlu B. Lomber disk cerrahisi sonrası hayatı tehdit eden vasküler komplikasyon: iliak arter pseudo anevrizma ruptürü. *Turkish J Vasc Surg* 2004; 13: 35-8.
- Hildreth DH, Turcke DA. Post laminectomy arteriovenous fistula. *Surgery* 1977; 81: 512-20.
- Edward C. Holscher. Vascular and visceral injuries during lumbar-disc surgery. *J Bone Joint Surg Am* 1968; 50: 383-93.
- Tanaka M, Nakahara S, Tanizaki M. Aortic pseudoaneurysm in the L3-L4 disc space after lumbar disc surgery: A case report. *J Bone Joint Surg Br* 1998; 80B: 448-51. [\[CrossRef\]](#)
- Birkeland IW, Taylor TK. Major vascular injuries in lumbar disc surgery. *J Bone Joint Surg Br.* 1969; 51: 4-19.