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# Pyogenic psoas abscess and secondary spondylodiscitis as a rare complication of percutaneous endoscopic lumbar discectomy: a case report

## Perkütan endoskopik lomber diskektomi sonrasında nadir bir komplikasyon olarak gelişen pyojenik psoas apsesi ve spondilodiskit: Olgu sunumu

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Percutaneous endoscopic lumbar discectomy (PELD) is known to be a safe procedure with a very low complication rate. A 29-year-old female patient developed a pyogenic psoas abscess following PELD. Despite early drainage, the infection spread to the spine causing secondary spondylodiscitis. Prolonged antibiotic treatment was ineffective, so the patient was subjected to anterior interbody fusion with iliac bone graft. At the end of a year, the fusion was solid with resolution of the psoas and spine infection. To our knowledge, this is first case of a psoas abscess as a rare complication of PELD.

*Key words:* Discitis/complications; Escherichia coli infections/complications; lumbar vertebrae/pathology/surgery; psoas abscess/etiology/microbiology/surgery; spinal fusion/adverse effects.

Perkütan endoskopik lomber diskektomi (PELD), çok düşük komplikasyon oranı olan güvenli bir prosedür olarak bilinmektedir. Yirmi dokuz yaşında bir kadın hastada PELD sonrasında pyojenik psoas apsesi saptandı. Erken drenaja rağmen enfeksiyon omurgaya yayılarak spondilodiskite neden oldu. Uzun süreli antibiyotik tedavisi etkili olmadı; sonuçta, hastaya iliyak kemik grefti ile anterior füzyon uygulandı. Bir yılın sonunda füzyonun solid olduğu ve apse ve enfeksiyonun kaybolduğu görüldü. Bildiğimiz kadarıyla olgumuz, PELD sonrasında nadir bir komplikasyon olarak gelişen psoas apsesinin bildirildiği ilk olgudur.

*Anahtar sözcükler:* Diskitis/kompliksyon; Escherichia coli/komplikasyon; lomber vertebra/patoloji/cerrahi; psoas apsesi/etyoloji/mikrobiyoloji/cerrahi; spinal füzyon/yan etki.

Pyogenic psoas abscess is an extremely rare but serious complication of spinal surgery that leads to profound morbidity. Secondary pyogenic psoas abscess complicating a spinal procedure has been reported in both the anterior and posterior open procedures and also following intramuscular injections, more commonly in patients with chronic medical comorbidities.[1-5] Usually the psoas abscess occurs as an extension of the spinal infection with the primary focus in the spine.[5] Percutaneous endoscopic lumbar discectomy (PELD) is known to be a safe procedure with a very low complication rate. We present a rare case of a pyogenic psoas abscess and secondary spondylodiscitis that occurred following PELD.

## CASE REPORT

A 31-year-old female patient presented with radiating pain in the right lower extremity of a-year duration. She had several epidural injections and root blocks for the pain during the previous six months, but they were no avail. Her past medical history was unremarkable except for an abdominal surgery for intussusceptions five years ago. Magnetic resonance imaging (MRI) showed extruded disc herniation at $L_{4-5}$ level on the right side. She underwent PELD under local anesthesia through the transforaminal route with complete removal of the disc fragment (Fig. 1a, b). Following the procedure, she had immediate relief of the radiating pain and was discharged from the hospital the same day.

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Three days after the operation, she experienced right flank pain of sudden onset that radiated to the groin down to the knee. Physical examination revealed paravertebral tenderness and flexion deformity in the right hip. Blood chemistry showed elevated white blood cells (WBC-15,200/µl), C-reactive protein (CRP - 69.9 mg/l) and erythrocyte sedimentation rate (ESR - 60 mm/hr). Emergent MRI showed ring shadow in the right psoas muscle, suggesting abscess formation. Computed tomography (CT) guided aspiration revealed flank pus. The abscess was drained percutaneously and broad-spectrum antibiotic treatment was started including first-generation cephalosporin and aminoglycoside. The organism isolated was *Escherichia coli*. We changed intravenous antibiotics to third-generation cephalosporin, aminoglycoside, and metronidazole. Despite the percutaneous drainage and antibiotic treatment, the abscess increased in size with progressive aggravation in blood chemistry (Fig. 2a, b). One week after the initial endoscopic surgery, open drainage of the abscess was performed through the right retroperitoneal approach. In order to rule out concomitant colon injury, intraperitoneal examination of the colon was performed, but there was no discernable perforation of the colon. The wound was closed over a suction drain. Following the drainage, the patient's symptoms improved significantly; however, follow-up MRI showed spread of the infection to $L_{4-5}$. With antibiotic therapy, ESR and CRP values returned to normal two weeks after the open drainage. Antibiotic therapy was continued for six weeks and the patient was discharged with oral antibiotics.

Three months after the open drainage, the patient returned with acute aggravation of back pain, for which MRI showed aggravation of the vertebral destruction with pus formation (Fig. 3a, b). Anterior fusion was performed through the left

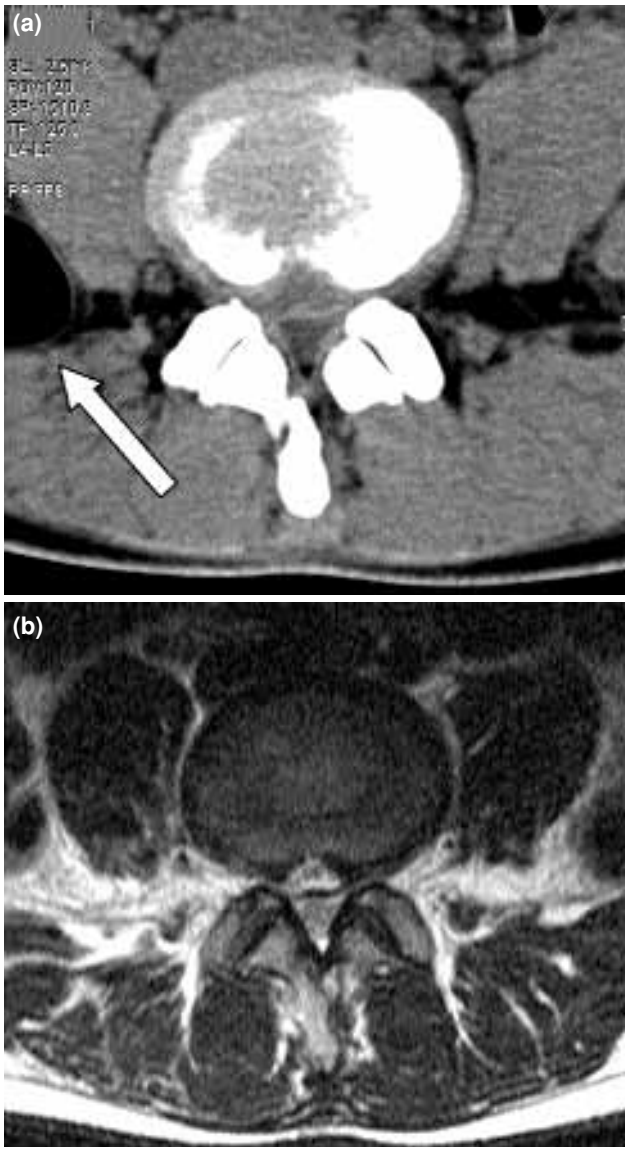


**Fig. 1. (a)** Appearance of disc herniation at $L_{4-5}$. Note the proximity of the posteriorly located colon (arrow). **(b)** A postoperative magnetic resonance scan showing adequate removal of the extruded fragment.

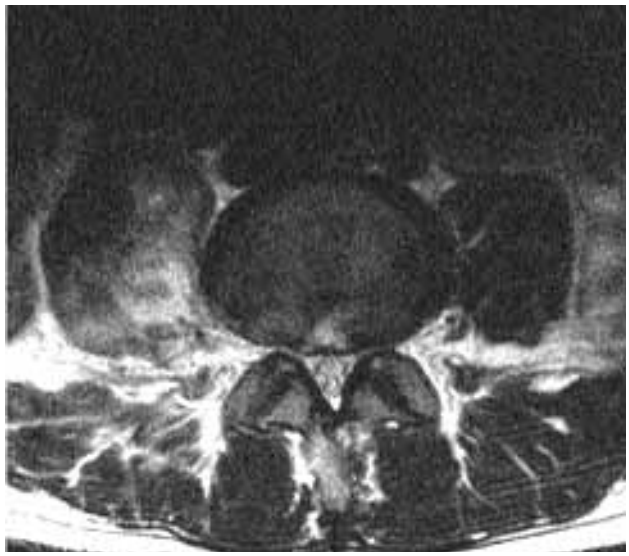

**Fig. 2.** An axial magnetic resonance scan three days after PELD, showing a mass lesion in the right psoas suggestive of an abscess. The patient complained of abdominal pain and right hip pain due to psoas irritation.

retroperitoneal approach using autogenous bone iliac graft and percutaneous facet screws.[6] At one-year follow up, the patient showed solid fusion of $L_{4-5}$ with resolution of back pain. Blood chemistry profile was normal on three consecutive visits (Fig. 4a, b).

## DISCUSSION

Infectious complications following percutaneous lumbar spinal procedures have been reported in discography, chemonucleolysis, and percutaneous discectomy procedures, with incidence ranging from 0% to 4%.[7-10] Most of the infections are

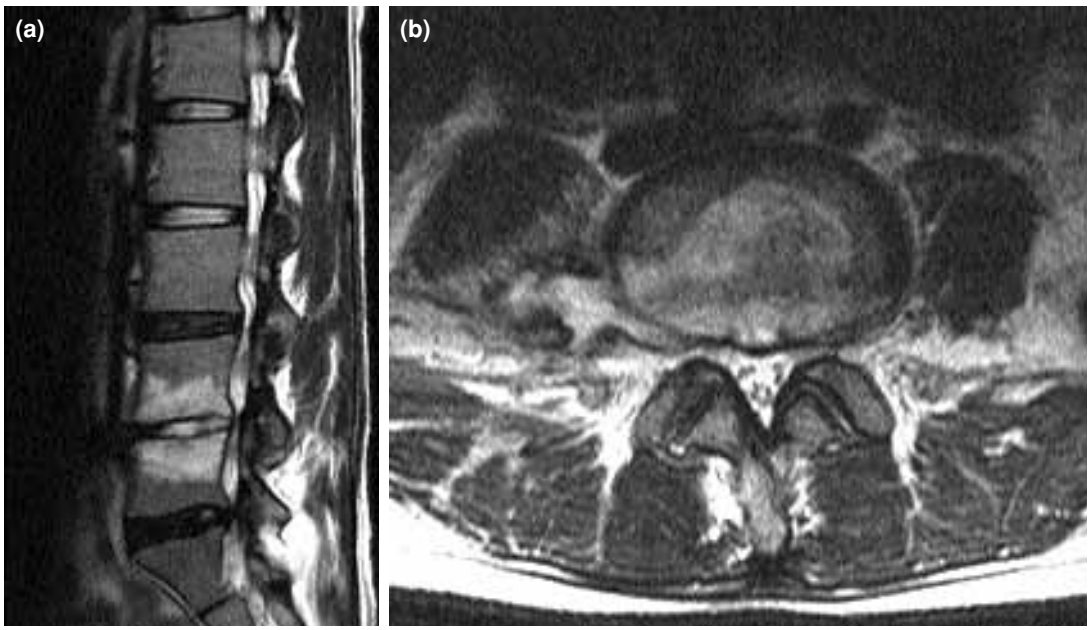


**Fig. 3. (a)** Sagittal and **(b)** axial images three months after PELD, showing progression of the psoas abscess to spondylodiscitis.

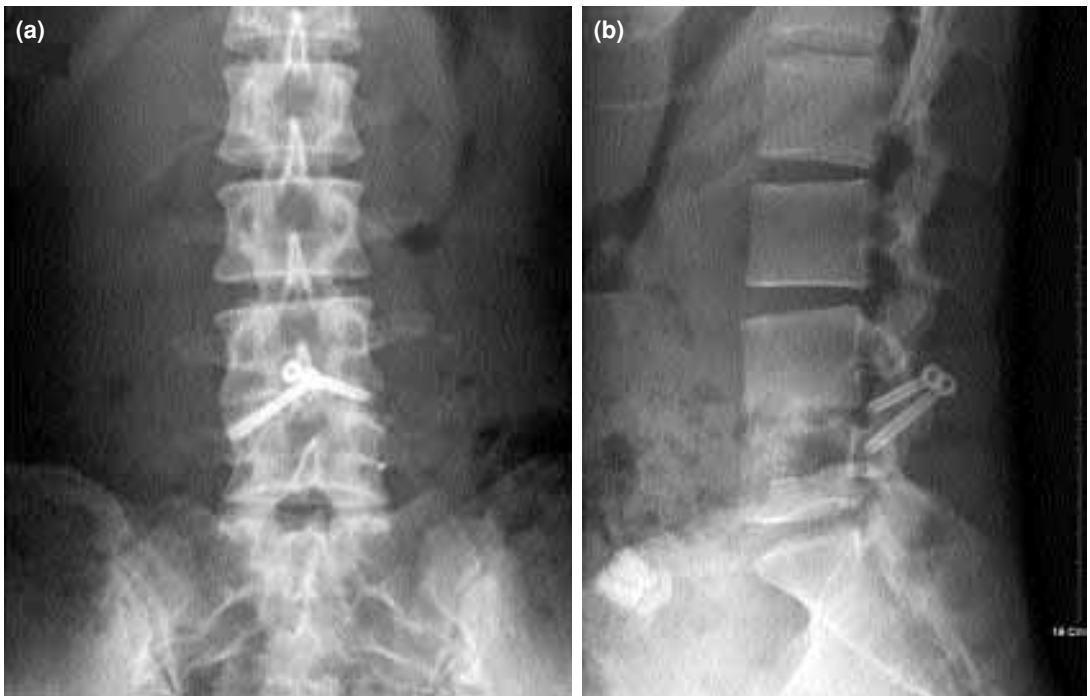


**Fig. 4. (a)** Anteroposterior and **(b)** lateral radiographs obtained a year after anterior fusion with posterior facet screw fixation. Union is complete with relief of symptoms.

spondylodiscitis, with sporadic case reports of spinal epidural abscess.[11] Psoas abscess complicating a spinal procedure has been reported in anterior and posterior open surgeries and injection therapies,[1-5] but there has been no prior report of pyogenic psoas abscess complicating a percutaneous endoscopic discectomy procedure. In reported cases, the psoas abscess occurred secondary to iatrogenic infections of the spine; thus, the patient in the present report is likely to be the first case with a psoas abscess that spread to the disc space causing spondylodiscitis.

Infections following percutaneous procedures are attributed to the introduction of causative organisms, most commonly the skin flora, into the disc space by contaminated needles or instruments. As most of the percutaneous discectomy procedures involve the use of discography to guide the placement of instruments, infections following percutaneous discectomy procedures are closely related to the placement of the discography needle into the disc space.

Unlike other percutaneous discectomy methods that aim for central decompression of the intervertebral disc with indirect decompression of the neural tissue (e.g. automated percutaneous lumbar discectomy, arthroscopic discectomy), percutaneous endoscopic lumbar discectomy with the use of a posterolateral transforaminal route aims for the extruded fragment itself for targeted fragmentectomy and the success of the procedure relies on the precise placement of the needle to guide the instrument to the optimal location. This necessitates insertion of the discography needle from a point more lateral from the midline than the usual entry point so that the disc space is entered more obliquely through the neural foramen to allow the surgical instrument to be in the vicinity of the posteriorly extruded fragment.[10] This lateral starting point of the needle may increase the risk for inadvertent contact with the abdominal viscera, especially in patients with a posteriorly located colon. Considering the bacteriology and the rapid formation of the abscess, the psoas abscess in this patient seems to result from an inadvertent tap into the colon during the initial needle approach to the disc space.

To avoid such a complication, a meticulous preoperative planning is necessary, with careful evaluation of the subject level on axial CT or MRI images (e.g. identification of peritoneum and colon position) to choose the optimal trajectory for approaching the disc space and not to penetrate abdominal viscera, especially in a slim person.

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