

Conservative management of psoas haematoma following complex lumbar surgery

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ABSTRACT

We report psoas hematoma communicating with extradural hematoma and compressing on lumbar nerve roots during the postoperative period in a patient who underwent L3/4 level dynamic stabilization and L4/5 and L5/S1 posterior lumbar interbody fusion. Persistent radicular symptoms occurring soon after posterior lumbar surgery are not an unknown entity. However, psoas hematoma communicating with the extradural hematoma and compressing on L4 and L5 nerve roots soon after surgery, leading to radicular symptoms has not been reported. In addition to the conservative approach in managing such cases, this case report also emphasizes the importance of clinical evaluation and utilization of necessary imaging techniques such as computed tomography (CT) scan and magnetic resonance imaging (MRI) scan to diagnose the cause of persistent severe radicular pain in the postoperative period.

Key words: Posterior lumbar interbody fusion, postoperative radicular pain, psoas hematoma

INTRODUCTION

Posterior lumbar interbody fusion (PLIF) for degenerative lumbar scoliosis is a well established surgical treatment option that is practiced by several authors. In addition, PLIF surgery is one of the commonly performed procedures for lumbar stenosis patients and gaining popularity due to predictable results.¹⁻³ As with any surgical procedure, complications after PLIF surgery are not uncommon. Some complications are well described, but rarer ones continue to appear given that more number of procedures are performed worldwide.⁴

The common perioperative complications after PLIF surgery include dural tear, neurological deficit, ileus, urinary tract infection, postoperative transient delirium, and superficial infection.^{4,5} Even though the development of a psoas

abscess as a complication of the PLIF procedure has been well described in the literature,^{6,7} to our knowledge, psoas hematoma as a cause for early recurrence of preoperative radicular symptoms in the immediate postoperative period has not been reported.

We present a rare case of large psoas hematoma communicating with extradural hematoma and mimicking radicular symptoms in the early postoperative period.

CASE REPORT

A 50-year-old female without any history of bleeding disorders presented to us with a 2 year old history of severe discogenic low back pain with left-sided lower limb radiculopathy in lumbar 4, 5 and S1 nerve root. Additional symptoms included difficulty in walking up to 15-20 m due to neurological claudication. A complete spinal assessment revealed restricted spinal movements and decreased sensation over left L3. Patient was on analgesics (Tramadol, Paracetamol), antihypertensives (Lisinopril) and inhalers for asthma. There was no history of ingestion of anticoagulant medications. The preoperative blood parameters including hematology, biochemistry and clotting profiles were within normal limits. Initial radiographs of lumbar spine revealed degenerative scoliosis with convexity to right from L1 to S1 with a sideways slip at L4/5 and rotation from the L3/4 level upward in the vertebrae [Figure 1a and b]. Magnetic resonance imaging (MRI) scans preoperatively revealed severe stenosis at L4/5 and L5/S1 [Figure 1c and d]. After failed

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conservative measures for 6 months, the patient was offered surgery. He underwent dynamic stabilization using Inlign™ multi-axial pedicle screws [Disc Motion Technologies (DMT), Yarm UK] at L3 and L4 levels and a posterior lumbar interbody fusion using 11 mm cages (SABER CFRP I/F cage system, DePuy spine, Warsaw, In, USA) using a less invasive approach at L4/5 and L5/S1 levels [Figure 2]. There were no intraoperative complications. She received two doses of perioperative antibiotic prophylaxis (Cefuroxime) and pneumatic calf compression device as mechanical thromboprophylaxis. In the immediate postoperative period, the radicular pain symptoms settled completely and no further neurological deficiency was observed. She was mobile independently without any aids on the second postoperative day and discharged with oral analgesics.

Subsequently, on the fourth postoperative day, she was readmitted to the hospital with symptoms of left-sided radicular pain, similar to the preoperative symptoms. On clinical examination, she was apyrexial, tender over the

left iliac fossa and percussion of the left flank produced left radicular symptoms again. A detailed neurological examination was performed which revealed decreased sensation over L4 and 5 dermatomes and motor power of Medical Research Council (MRC) grade 4 on left L4 and L5 myotomes. She was started on analgesic medications such as Tramadol, Paracetamol, Diclofenac, and oral morphine. In addition, Amitriptyline and Gabapentine were started to ease the radicular pain. Blood investigations such as full blood count, urea and electrolyte, C-reactive protein (CRP), coagulation profile, blood culture and erythrocyte sedimentation rate (ESR) were done. Initial postoperative radiographs of lumbar spine did not show any obvious abnormalities. A computed tomography (CT) scan of the abdomen was performed to rule out any retroperitoneal hematoma, deep infection, or screw malplacement. CT scan revealed a collection with gas behind the left psoas muscle at the level of L4/5 vertebral body. MRI [Figure 3] of the lumbar spine revealed a large collection measuring $7.6 \times 4.3 \times 3.3$ cm adjacent to the L4–S1 vertebral bodies. In addition, there was 3×3.5 cm collection containing gas, which was noted posteriorly at the L4 level, displacing the thecal sac anteriorly. This collection was communicating with the extradural hematoma through the left L4 exit foramen [Figure 3c]. In addition to this, a decision was made for further image-guided drainage of the collection for the next day. However, as the patient reported substantial improvement in her symptoms within 12 h of starting conservative measures, it was decided to wait for further improvement. Surprisingly, within 2 days of starting the conservative therapy, her symptoms settled completely and she started mobilizing independently. She was discharged within 4 days of second admission. At discharge, her CRP was 6 mg/L and WBC 13×10^9 cells/L. Blood cultures did not grow any organisms. At 6 months followup, she was symptom free, without any residual neurological deficit,



Figure 1: Preoperative radiographic and MRI images: (a) anteroposterior radiograph of the lumbar spine showing degenerative changes and scoliosis with convexity to the right (b) lateral radiograph of the lumbar spine demonstrating grade I degenerative spondylolisthesis at L4/5 level (c) sagittal T2W MRI of the lumbar spine showing severe left-sided stenosis at L4/5 and L5/S1 levels (d) axial T2W MRI showing severe right-sided stenosis at L4/5 level



Figure 2: Postoperative anteroposterior (a) and lateral (b) radiographic images demonstrating clear decompression and normal sagittal alignment

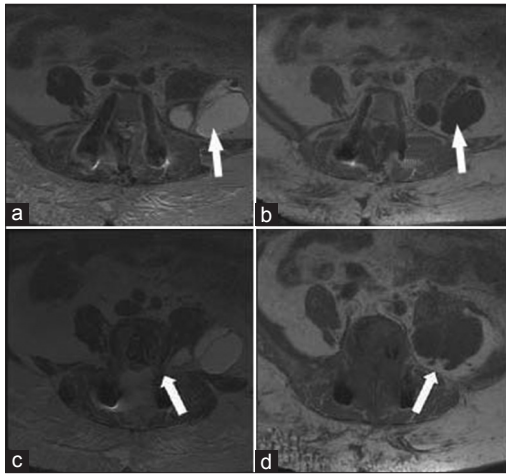


Figure 3: Postoperative MR images of the lumbar spine: (a) Axial T2weighted image showing high signal intensity confirming the collection (white arrow) (b) axial T1weighted image showing low signal intensity over the posterior aspect of the psoas muscle (white arrow); (c) axial T2weighted MR image demonstrating communication of collection with operative collection (white arrow) (d) axial T1 gadolinium-enhanced image showing the low intensity zone over the collection (white arrow)

walking up to 2 miles, and had resumed her profession as a cook.

DISCUSSION

Psoas hematoma as a cause for early recurrence of preoperative radicular symptoms in the immediate postoperative period has not been reported. However, few sporadic reports of psoas hematoma resulting in other nerve symptoms have been cited in the literature.^{8,9} Robinson *et al.* have reported a case of femoral neuropathy that developed 8 weeks after posterior spinal decompression, which resolved after surgical evacuation.⁸ The possible cause for development of psoas hematoma in the immediate postoperative period includes injury to the lumbar segmental vessels or usage of low-molecular-weight heparin (LMWH) in the postoperative period.⁹ Apart from other medical causes, hemophilia remains one of the major medical causes of spontaneous psoas hematoma.¹⁰

Psoas hematoma or collection should be suspected in patients presenting with recurrence of radicular symptoms in the early postoperative period. Classic presentation includes groin and/or flank pain along with radiculopathy symptoms in the distribution of involved nerve roots.^{8,9,11} The clinical examination usually shows some flexion attitude of the hip, limitation of hip flexion, and pain reproduction on passive extension of the hip.⁸ Limitation of straight leg raise test¹¹ is usually seen as a positive test on the affected side. Abnormal vital signs such as hypotension and tachycardia should suggest the possibility of intraoperative arterial injury¹¹ with hemodynamic compromise.

CT scan is a useful diagnostic and therapeutic tool for diagnosis of psoas collection. If arterial injury is suspected, one should also consider contrast-enhanced CT scan or angiography.¹¹ Nevertheless, MRI is more sensitive than a CT scan for identifying and distinguishing the etiology of psoas hematoma, which often appears as high signal intensity images on T1- and T2-weighted images.¹²

The treatment for psoas hematoma has been described from observation¹¹ to CT-guided percutaneous drainage⁵ or open drainage of the collection.^{6,8} If a patient is known to have coagulation disorders or is on anticoagulation treatment, one should give importance to correcting their coagulation profile before embarking on other options. For example, in a hemophiliac patient, bed rest and factor replacement remains the first-line treatment.¹⁰ Even with arterial injury being the cause, careful monitoring and blood transfusion to correct tissue perfusion pressures and hemoglobin levels have been shown to be effective.¹¹ In this case, a plan for percutaneous CT-guided drainage was made; however, within 24 h, the patient responded very well to the analgesic and antiinflammatory treatment and, therefore, drainage was not indicated. Even though surgical evacuation of hematoma is an effective option,⁸ in cases with acute psoas muscle hematoma of small sizes, an expectant treatment has shown to be more effective.^{9,11}

In the absence of arterial injury and anticoagulation medication, the possible etiology may have been from direct injury to the psoas muscle. Due to the anatomy of origin of psoas muscle from the intervertebral disks, bodies, and transverse processes from T12 to L5,¹³ it is at risk of injury during pedicle instrumentation. In addition, meticulous hemostasis before closure is important to preclude the formation of a hematoma.

In this scenario, the patient had initial brief symptomatic relief followed by recurrence of symptoms on the fourth postoperative day. The initial concerns should be of a screw malplacement or an early infection. However, the patient did not have any signs of sepsis other than elevated white cell count and CRP. The serum markers like CRP and ESR can be elevated for up to 14 postoperative days after spinal surgery, and only progressive increase in the level of these markers is indicative of infection rather than an isolated episode of elevated level.¹⁴ She was discharged on the seventh day after the second admission, with completely normal inflammatory markers and total symptomatic relief. Therefore, it may be prudent to observe the patient with conservative management for signs of improvement before opting for any surgical intervention. There was no recurrence of symptoms and she was completely

asymptomatic at 6 months followup. Followup imaging in the form of CT or MRI scan at 6 months to confirm the disappearance of lesion would have been ideal. However, in standard NHS (National Health Service, UK) clinical practice, radiological investigations are performed only if clinically indicated. As this patient had complete resolution of symptoms, no further imaging studies were attempted.

Psoas hematoma should be considered as one of the differential diagnosis in patients with recurrent postoperative radiculopathy even if no predisposing factors like bleeding diathesis or anticoagulation are present. This case highlights the fact that surgical drainage of a hematoma is not mandatory even in the presence of large intramuscular collection and there is a fair chance that the hematoma may resolve with an expectant treatment.

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