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Case Report

Psoas Hematoma as a Rare Complication After Posterior Lumbar Interbody Fusion: Case Report and Literature Review

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Abstract

Background: Psoas muscle hematoma is uncommon but potentially serious complication following spinal interbody fusion surgeries. It can result in significant morbidity and prolonged hospitalization if not promptly diagnosed and managed. Herein, we present a case report of psoas muscle hematoma following spinal interbody fusion and review the current literature regarding its etiology, presentation, diagnosis, and management.

Case Presentation: A 52-year-old female presented with severe lower back pain and radiculopathy following spinal interbody fusion surgery. Imaging studies revealed a large hematoma within the psoas muscle adjacent to the surgical site. The patient managed conservatively with bed rest and blood transfusion, leading to the resolution of symptoms and hematoma over time.

Literature Review: Psoas muscle hematoma after spinal interbody fusion is often attributed to intraoperative vascular injury or excessive manipulation of surrounding tissues. Clinical manifestations include acute-onset back pain, neurological deficits, and signs of vascular compromise. Prompt diagnosis is crucial and typically achieved through magnetic resonance imaging (MRI) or computed tomography (CT) scans. Management strategies range from conservative measures such as bed rest and analgesia to more invasive interventions, including percutaneous drainage or surgical exploration, depending on the severity of symptoms and hematoma size.

Conclusion: Psoas muscle hematoma is a rare but potentially serious complication following spinal interbody fusion surgeries. Physicians should maintain a high index of suspicion for this condition in patients presenting with acute-onset back pain or neurological deficits postoperatively. Early diagnosis and appropriate management are essential to prevent complications and optimize patient outcomes. Further research is warranted to elucidate optimal strategies for the prevention and management of this rare complication.

Keywords: Psoas; Psoas Hematoma; Posterior Fusion

Introduction

The posterior lumbar interbody fusion was first described in 1952 to treat a ruptured disc and was later used to treat chronic back discomfort caused by spondylolisthesis [1,2] and increased in popularity, with indications including spinal stenosis, instability, degenerative disc disease, spondylolisthesis, spondylolysis, and bilateral disc herniation [3]. In comparison to other fusion methods, PLIF has a low complication rate and a high rate of fusion during follow-up [3].

Postoperative neurological deficit is the most common PLIF complication, with reported incidences ranging from 9.0 to 24.6% because of nerve root destruction, which causes problems such as neurological deficit and dural tear [4]. Other complications noticed were ongoing blood loss arising from the posterior approach due to muscle dissection of the paraspinal musculature and epidural venous blood loss [5].

Multiple-level fixation, longer surgeries, and non-union have all been shown to have a positive connection with complication rates. One cause for the higher risk of complications linked with longer procedures was continuous bleeding from the operation site while progressing at other levels [4]. Psoas intramuscular Hematoma is an uncommon illness with a variety of causes, including trauma, anticoagulant usage, iatrogenic damage during a lumber operation, and bleeding problems [6].

The most common cause is vascular injury during the PLIF operation. Vascular injuries are uncommon (.01% to 1%) but potentially fatal complications in thoracic and lumbar spine surgery [7].

Materials and Methods

We present a case of psoas hematoma after posterior lumbar interbody fusion and review the previous reports that concern psoas hematoma after posterior lumbar interbody fusion. The search engine which was used in the literature search was PubMed. A combination of these terms was used “psoas” or “psoas hematoma” or “posterior fusion”. The search was restricted to literature that is related to human beings and the English language. We included six papers published between 2014 and 2023 that conformed to our criteria.

Case Presentation

A 52-year-old female patient, devoid of significant medical or surgical history, presented at the outpatient clinic with symptoms suggestive of lumbar canal stenosis. She reported experiencing lumbar back pain coupled with radiculopathy affecting both lower limbs. Initially, the discomfort responded to basic analgesia and rest; however, it exhibited a progressive nature, necessitating the administration of multiple analgesic drugs daily in the month preceding her clinic visit.

Upon examination, bilateral muscular strength was intact, albeit with mild hypoesthesia predominantly affecting the L5 and S1 dermatomes. Reflexes were within normal limits, with no pathological reflexive responses. Noteworthy positive findings were discerned during the Stoop test, lumbar extension test, and bilateral leg raise test.

Following evaluation, lumber spine MRI without contrast relived lumber canal stenosis from level L2-L3,L3-L4 and L4 -L5, with grade 1 spondylithiasis of L3-L4 Figure 1. decision was to operate on the patient with decompression and interbody fusion spanning from L2 to L5.

Figure 1: Preoperative MRI, sagittal view (lumbar canal stenosis at levels L2-L3, L3-4 and L4-L5 with anterior spondylesthesis at level L3-L4).

On postoperative day 0, the patient was vitally stable without neurological deficit and improvement of the symptoms. H.B (Hemoglobin) reading was 10.3 g/dl compared to the pre-op value of 12.1 g/dl. On postoperative day 1, the patient experienced tachycardia (H.R 110) but showed complete resolution of the signs of lumbar canal stenosis that were present pre-op. Serial H.B measurements were ordered daily, at the same time started investigation regarding the drop of H.B including chest and lumber x-ray (Figure 2.1), abdomino-pelvic Ultrasound lumbosacral x-ray (Figure 2.1) with no definitive cause could explain the drop.

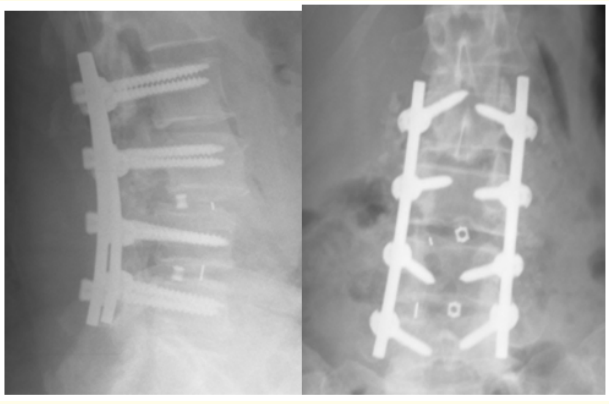

Figure 2.1: Postoperative lumbar spine X-ray (AP and Lateral view).

On the third postoperative day, the patient had persistent tachycardia, and the drop of the H.B reached 7 g/dl, two units packed red blood cells (pRBCs) transfusion was done, an abdominal and pelvic computed tomography (CT) which disclosed the presence of a left psoas muscle hematoma at the level of l3-l4 l5 (Figure 2.2), with satisfying position of pedicle screws and interbody cages. The decision was to treat post operative psoas hematoma conservatively, keeping the pt bed rest with follow up H.B level, after that the H,B stabilized for the next two days but symptom of radiculopathy reappeared without neurological deficit, so lumber Magnetic Resonance Imaging (MRI) was done which revealed extension of the hematoma to the epidural space via the intervertebral foramina.

On day 9, the patient was ambulatory with full recovery from radiculopathy with stable vital signs and H.B level, and follow-up continued in the outpatient clinic. A 3 months follow-up CT scan of the lumbar spine showed complete resolution of the hematoma figure 3.

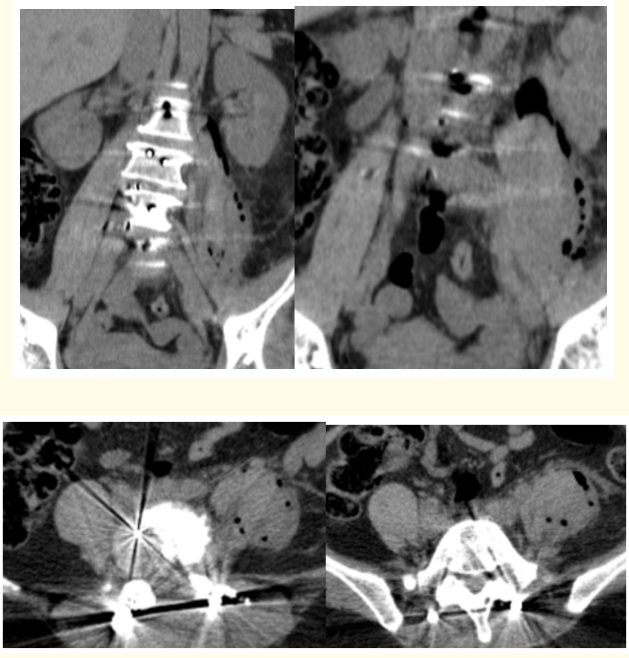

Figure 2.2: Postoperative CT scan shows left psoas enlargement with gas phenomenon.

Figure 3: Follow up CT scan after 3 months shows resolving of the psoas hematoma.

Clinical Discussion

The posterior lumbar interbody fusion indications include spinal stenosis, instability, degenerative disc disease, spondylolisthesis, spondylolysis, and bilateral disc herniation [3].

Psoas hematoma is one of the rare complications associated with posterior lumbar fusion surgery. This complication can be caused by several factors, such as injury to the psoas muscle during the surgical procedure, damage to the blood vessels in the area, especially the segmental artery, which originates from the posterior wall of the abdominal aorta, or coagulation disorders.

The symptoms of a psoas hematoma can vary depending on the severity of the condition. Some people may experience pain or swelling in the lower abdominal region, while others may have difficulty moving or walking. In severe cases, a psoas hematoma can even lead to nerve compression with radiculopathy or impaired blood flow to the affected area.

Although a psoas hematoma can be a concerning complication, it is infrequent and can be treated effectively with early intervention. Treatment may include supportive care, such as rest, pain management, and physical therapy, as well as more invasive measures, such as drainage of the hematoma and embolization of the bleeding artery.

Including the current report, a total of seven cases of psoas hematoma after posterior spinal interbody fusion surgery are included in the literature (Table 1). Four were females (57%), and the remaining were males (43%), with an age range of 13 to 77 years. The levels were operated from T11 to L5. Only one case had a history of anticoagulant use before the surgery.

Study ID	**Bo Deng., *et al.* (2020)**	**Guan Shi., *et al.* (2023)**	**Sandesh Lakkol., *et al.* (2014)**	**R.Daureeawoo., *et al.* (2017)**	**Marvin Man Ting Chung., *et al.* (2018)**	**Ibrahim S Almazrua., *et al.* (2020)**
Age	57	65	50	36	13	77
Sex	Male	Female	Female	Male	Female	Male
Level	L4 – l5	L4-L5	L3 -S1	L4 -S1	T11-L4	L3 -L5
Presentation	Abdominal pain, right lower limb pain	Low back pain, left hip, left inner thigh pain	Left side lower limb radiculopathy	Pins and needles in right thigh, pain in right groin, reduced power in right hip	Right lower quadrant abdominal pain, right flank pain, low grade fever	Lateral flank bruises, left groin pain and numbness
Time of dx (days postop.)	20	5-6	4	6	1	4
Anticoagulant use	No	Not mention	No	Not mention	No	Yes
Preexisting bleeding tendency	No	Not mention	No	Not mention	No	No
Blood transfusion	Yes	Yes	No	No	No	Yes
Management	Embolization	Embolization	Conservative	Embolization	Conservative	Conservative

Table 1

The presenting symptoms include abdominal pain, flank pain, and radiculopathy, without any neurological deficit in any of them. The time of diagnosis differed as early as the first day and as late as the 20th day after the surgery.

Four cases of seven, including ours, were managed conservatively (63%), while the other three were managed by embolization (43%), and none of them needed surgical evacuation of the hematoma. Four of the cases, including ours, needed a blood transfusion

during the management, two were conservative management cases, and two were managed by embolization.

We advise surgeons to be aware of such symptoms after posterior spinal fusion procedures and observe the vital signs and Hb levels to obtain an early diagnosis for this rare complication.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Informed Consent and Ethical approval

Informed written consent was obtained from the patient for publication of this report and any accompanying images.

This study was approved by the Ethical Committee of Prince Hamzah hospital.

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