



## Case Report

# Delayed asymptomatic retroperitoneal dislodgement into the pouch of Douglas of a TLIF cage: A case report and review of the literature

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## ABSTRACT

**Background:** Intraoperative anteropulsion of a transforaminal lumbar interbody fusion (TLIF) cage is infrequent but may have disastrous complications. Here, we present an 80-year-old female whose L5-S1 TLIF cage extruded anteriorly and later migrated into the pouch of Douglas (i.e. an anterior peritoneal reflection between the uterus and the rectum) posing potential significant risks/complications, particularly of a major vessel injury. Notably, this 80-year-old patient with degenerative lumbosacral scoliosis should have only undergone a lumbar decompression alone.

**Case Description:** An 80-year-old female underwent a two-level L4-L5 and L5-S1 TLIF to address lumbosacral canal stenosis with degenerative scoliosis. During the L5-S1 TLIF, intraoperative fluoroscopy showed the anterior displacement of the cage ventral to the sacrum. As she remained hemodynamically stable, the cage was left in place. The postoperative CT scan confirmed that the cage was located in the retroperitoneum but did not jeopardize the major vascular structures. Three months later, however, the cage migrated inferiorly into the pouch of Douglas. Although asymptomatic, general surgery and gynecology advised laparoscopic removal of the cage to avoid the potential for a major vessel/bowel perforation. However, the patient refused further surgery, and 3 years later remained asymptomatic.

**Conclusion:** Anterior cage migration following TLIF has been rarely reported. In this case, an L5-S1 TLIF cage extruded anteriorly in an 80-year-old severely osteoporotic female and migrated 3 months later into the pouch of Douglas, posing the risk of a major vessel/bowel injury. Although surgical removal was recommended, the patient refused further surgery but remained asymptomatic 3 years later. Notably, the authors, in retrospect, recognized that choosing to perform a 2-level TLIF in an 80-year-old female reflected poor judgment.

**Keywords:** Anteropulsion of cage, Lumbar canal stenosis, Pouch of Douglas, Retroperitoneal, Transforaminal lumbar interbody fusion

## INTRODUCTION

Transforaminal lumbar interbody fusions (TLIFs) are rarely indicated in elderly patients with lumbar stenosis/degenerative scoliosis. Here, we present an 80-year-old severely osteoporotic female who experienced intraoperative anteropulsion of a TLIF cage that migrated 3 months later into the pouch of Douglas, thus posing a significant risk for

potentially life-threatening vascular and/or bowel injuries.<sup>[1,4,9]</sup>

## CASE DESCRIPTION

An 80-year-old female underwent a two-level TLIF (L4-L5, L5-S1) for spinal canal stenosis with degenerative scoliosis [Figure 1]. Notably, in this age group, such an extensive TLIF fusion would typically be considered unnecessary. Intraoperative fluoroscopy revealed that both cages on impaction crossed the anterior margin of their respective vertebral bodies (potentially risking major organ/vessel injury, deep vein thrombosis, and/or nerve injury, Figure 2). Although the L4-L5 cage was successfully repositioned intraoperatively, the L5-S1 cage migrated further anteriorly [Figures 3 and 4]. However, as she remained hemodynamically stable, the cage was left in place.

### Postoperative observation and studies

Postoperatively, for 24 h, the hemoglobin, arterial blood pressure, and pulse were monitored closely in the intensive care unit. The postoperative CT scan confirmed that the cage was located in the retroperitoneum, but had not jeopardized the major vascular/bowel structures. Nevertheless, the patient and family were told that revision surgery was necessary; they declined. Three months later, however, the X-ray showed further inferior migration of the cage into the pouch of Douglas [Figure 5]. At this point, both general surgery and gynecologic consultants recommended laparoscopic cage removal, which was again refused. Three years later, the patient, fortunately, remained asymptomatic.

## DISCUSSION

### Frequency of TLIF (anterior vs. posterior) cage migration

L4-L5 is the most common level for TLIF anterior cage migration; 0.8% require reoperation (immediate

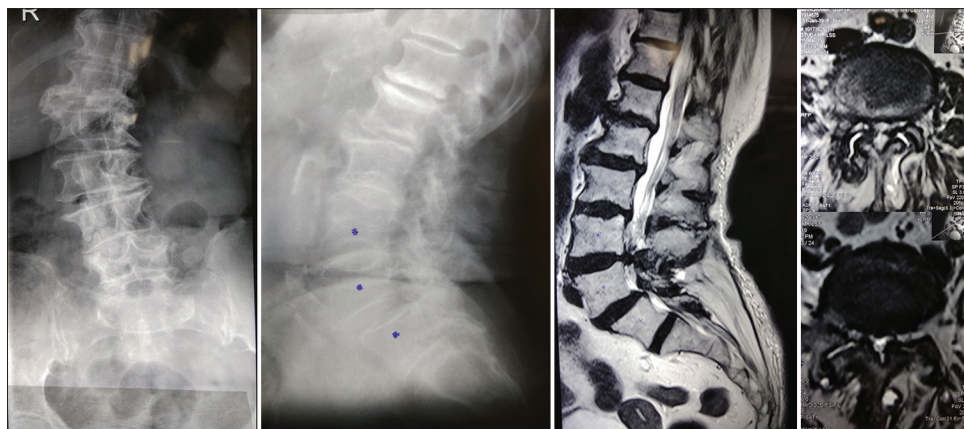
vs. delayed removal), while 1.5% are left in place.<sup>[4]</sup> Of interest, there are no fixed guidelines regarding the indications for reoperating on anteriorly extruded TLIF cages [Table 1].<sup>[1,7,8,10,11]</sup> Retroperitoneal expulsions of TLIF cages typically occur because of excessive curettage, the misdirected uncontrolled hammering of the cage without fluoroscopy, osteoporosis, degenerative scoliosis, and the unusual shape/position of the cage, among other factors [Table 2].<sup>[2,4]</sup> Posterior TLIF cage migration occurs in between 0.8% and 3.2% of cases.<sup>[5]</sup>

### Recognition/treatment of anteropulsion of TLIF cage

In select cases where intraoperative anterior cage/graft dislodgement has occurred during a TLIF, but vital signs remain stable, the surgery may be completed leaving the graft/cage in place.<sup>[2]</sup> However, this should trigger an immediate postoperative CT angiography to determine cage/graft location and assess whether there is a significant compression of the aorta/inferior vena cava or other major structures (i.e. risk of major vascular injury and bowel injury).<sup>[4,6,12]</sup> Alternatively, in other cases, emergent/urgent cage removal to avoid these complications is recommended, although the benefit must outweigh the risk.<sup>[10]</sup>

### Management of an anteriorly extruded TLIF cage that migrated into the pouch of Douglas

The management of an anteriorly extruded TLIF cage into the pouch of Douglas is controversial. The Douglas pouch is an anterior peritoneal reflection between the uterus and the rectum (i.e. rectouterine pouch). This pouch develops in females who have had multiple pregnancies or are older. It can lead to a defect or weakening involving the pelvic floor, and in some instances, the bowel may herniate into this pouch. Therefore, as in the case presented, surgical removal of the cage could prevent future chronic pain, intestinal obstruction/bowel injury, and/or vascular



**Figure 1:** Preoperative imaging showing L4-L5, L5-S1 spinal canal stenosis with degenerative scoliosis, with L5 transitional vertebral body.

**Table 1:** Complications in the literature due to anteropulsion of TLIF graft/cage.

S. No.	Author	Complication
1.	Cakmak <i>et al.</i> , 2010 <sup>[1]</sup>	Colon perforation
2.	Garg <i>et al.</i> , 2017 <sup>[4]</sup>	Sigmoid colon perforation
3.	Murase <i>et al.</i> , 2017 <sup>[6]</sup>	IVC injury
4.	Xu <i>et al.</i> , 2017 <sup>[11]</sup>	Left femoral nerve injury following cage extraction
5.	Proubasta <i>et al.</i> , 2002 <sup>[8]</sup>	Compressed major vessels
6.	Yoshimoto <i>et al.</i> , 2007 <sup>[12]</sup>	Deep vein thrombosis
7.	Pawar <i>et al.</i> , 2010 <sup>[7]</sup>	IVC injury

TLIF: Transforaminal lumbar interbody fusion, IVC: Inferior vena cava



**Figure 2:** Intraoperative fluoroscopy view after cage insertion showing both the cages has crossed the anterior vertebral body margin.



**Figure 3:** Successful repositioning of L4-L5 cage.

injury.<sup>[2]</sup> Most commonly, lateral retroperitoneal or anterior transperitoneal approaches are recommended for cage extraction.<sup>[3]</sup>

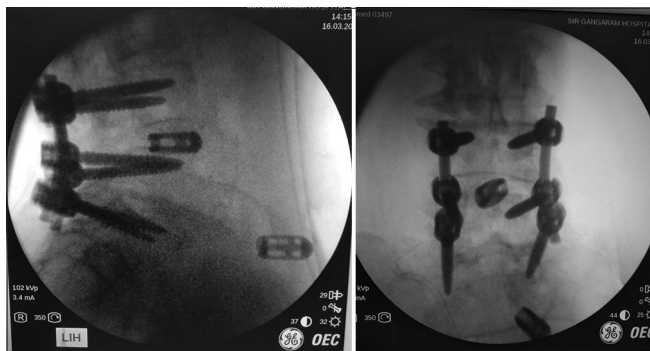
**Table 2:** Main key points which will help in the prevention of anterior cage migration.

S. No.	Factors used to avoid TLIF-related complications	Techniques to avoid complications
1.	Better preoperative planning	Avoid technical errors; Oversize or undersize cages
2.	Better surgical technique	Avoid excessive endplate curettage Avoid misdirected uncontrolled impaction/hammering of the cage without intraoperative fluoroscopic guidance
3.	Proper marking on trial and cage transducer	Choose the right cage size Assess the depth of disc space Avoid excessive cage impaction
4.	Avoid TLIF with osteomyelitis, diskitis, or pseudarthrosis	Oversize cage risks: Overstretch friable ALL Risk injury to major vessels/bowel
5.	Use intraoperative fluoroscopy for degenerative lumbar pathology	Degenerative scoliosis Dysplastic high spondylolisthesis, Aberrant vertebral body shape (trapezoid L5, dome shape S1 superior endplate)
6.	Final cage impaction	Set appropriate cage positions before detaching the holder and avoid using a final impactor
7.	Avoid with osteoporosis Avoid in elderly patients	Hammering a cage into osteoporotic bone can lead to endplate fracture and subsequent cage dislodgement
8.	Techniques for migrated cage extraction	Lasso technique Avoid distraction Tap hole steps <sup>[3]</sup>
9.	Better patient selection	Avoid elderly patients Avoid severe osteoporosis Avoid patients with major comorbidities Use decompressions alone where feasible

TLIF: Transforaminal lumbar interbody fusion, ALL: Anterior longitudinal ligament

### Poor judgment to place TLIF in an 80-year-old female

In this case, it was a mistake to choose to perform a TLIF in an 80-year-old osteoporotic female with degenerative stenosis/scoliosis. Her susceptibility to multiple other major risks/complications due to TLIF far outweighed any TLIF benefit. She should have simply been considered for a decompressive laminectomy. Exercising such better judgment in the future



**Figure 4:** Anterior migration of the cage at L5-S1 while attaching a cage holder.



**Figure 5:** Three months postoperative X-ray showed inferior migration of cage in the pouch of Douglas.

should prompt other surgeons to avoid such unnecessary TLIF in such octogenarians.

## CONCLUSION

An 80-year-old female with lumbar stenosis/scoliosis should have been managed with a decompressive laminectomy rather than a two-level TLIF (L4-L5, L5-S1). Due to the patient's marked osteoporosis, the L5-S1 TLIF cage extruded anteriorly, eventually migrating into the pouch of Douglas, thus risking major life-threatening vascular/bowel perforation complications.

## Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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