

Case Report

Acute Pancreatitis after Major Spine Surgery: A Case Study

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ABSTRACT: Postoperative acute pancreatitis can be a relatively common complication regarding abdominal surgery, especially for general surgeons who have a high suspicion and expertise in the specific field. After spine surgery, on the other hand, it is considered rare, and when it settles, it is non-negligible as it may progress to a life-threatening condition. Although there is a plethora of reports regarding postoperative acute pancreatitis after spine surgery, especially scoliosis correction surgery or extended fusion surgery, many spine surgeons do not acknowledge this rare complication. Factors that may favor the apparition of acute pancreatitis include intraoperative hypoperfusion, hemodynamic instability, correction techniques in spinal deformity conditions, and mechanical abdominal pressure due to the patient's position. We report a case of acute pancreatitis after posterior lumbar fixation and decompression for spinal canal stenosis.

KEYWORDS: Acute pancreatitis, major spine surgery, postoperative complications.

Introduction

Acute pancreatitis is the process in which autolysis of the pancreas occurs.

Postoperative settlement of acute pancreatitis is a serious condition and is common in abdominal surgery; especially when surgery is associated with the pancreas itself or the biliary tract, reports have also been made for postoperative pancreatitis after gastric surgery, splenectomy, splenorenal shunts as well as cardiac surgery [1-4].

Postoperative acute pancreatitis after spine surgery on the other hand, is rare and when it settles, is non-negligible as it may progress to a life-threatening condition [1,4].

Acute pancreatitis should be considered as a possible diagnosis when patients have at least two of the following three clinical and radiological findings and lab results: a) abdominal pain accompanied by nausea/vomiting, b) a minimum threefold increase above the normal margin in serum lipase level and c) characteristic signs of acute pancreatitis either on transabdominal ultrasound or on computed tomography scan, eventually meeting the Atlanta classification and definition of acute pancreatitis [1,4,5].

Although there is a plethora of reports regarding postoperative acute pancreatitis after spine surgery, especially scoliosis correction surgery or extended fusion surgery, many spine surgeons do not acknowledge this rare complication, even though incidence appears to

be declining thanks to two-stage correction on severe scoliosis, modern instrumentation, and perioperative patient management and treatment [4,6-13].

Patients with neurofibromatosis type I, Marfan syndrome, and cerebral palsy are at greater risk [1,12].

Underlying pathogenetic pathways that contribute to and lead to the onset of acute pancreatitis are primarily prolonged intraoperative splanchnic hypoperfusion due to excessive blood loss or hemodynamic instability, body positioning, and mechanical compression of the abdomen and the pancreas in patients with low body mass index (BMI) in scoliosis correction surgery, yet the pathogenic mechanism remains to be fully understood [1,5,11,14].

Case Presentation

We report a case of a 68-year-old female patient who underwent revision surgery for multilevel spinal canal stenosis.

A written agreement form was signed by the patient's part, giving us her consent to publish information and media relevant to her case.

The patient has a history of hypertension and dyslipidemia under treatment, and a BMI of 28, while she did not mention any previous incident of pancreatitis.

An uneventful open posterior fusion L3-S1 and decompression was performed with L3-L4 PLIF as demonstrated in (Figure 1), with no evident anterior screw breach and proper cage placement.

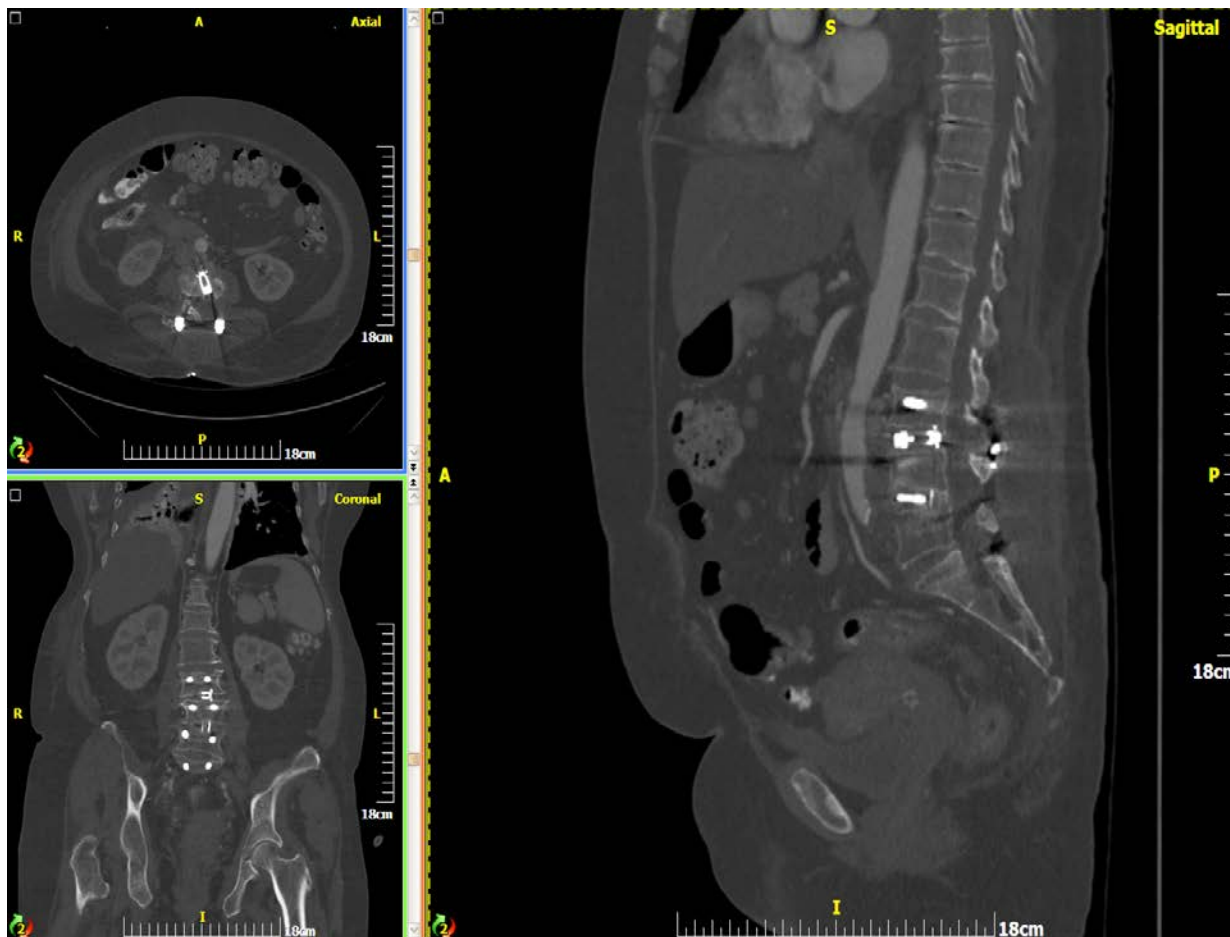


Figure 1. Postoperative CT scan demonstrating the posterior lumbar spinal fixation.

The surgical time under anesthesia was 158 minutes, while the intraoperative blood loss was less than 1 litre.

On the first postoperative day, the patient was complaining about sudden onset diffuse abdominal pain with nausea.

An immediate blood serum examination was ordered and revealed significantly elevated levels of serum amylase, CRP, and white blood cells as shown in (Table 1).

Table 1. Laboratory tests at the 1st postoperative day.

Postoperative Test	Result	Normal Range
WBC	21.000	4.6-10.2 $\times 10^3/\mu\text{L}$
CRP	20.90	<0.31 mg/dL
LDH	278	125-243 IU/L
SGOT	23	5-34 IU/L
SGPT	13	<55 IU/L
AMS	1240	25-125 IU/L
γ -GT	19	9-36 IU/L
CREATININE	0.53	0.60-1.10mg/dL
PROCALCITONIN	0.30	<0.50ng/mL

An abdominal CT scan showed signs of acute pancreatitis (Figure 2), the yellow arrows demonstrate high signal intensity effusions distributing around the pancreatic head, along the right lateroconal fascia and between the bowel loops, respectively (Figure 2).

As shown in a coronal reconstruction of abdomen computed tomography images, the solid white arrow show the edematous pancreatic head with the partially indistinct margins, whereas the blank arrow heads to the adjacent effusion accumulating to the weight-dependent part of the abdominal cavity (Figure 3).

Additionally, the MRI scan reconfirmed the diagnosis of pancreatitis with pathological fluid collection (Figure 4).

The management was solely conservative with diet modification and fluids.

The total hospital length of stay was 21 days, while the usual one in our department for this type of surgical procedure is 3-5 days.

Finally, the remission of the abdominal symptomatology was achieved on the 17th postoperative day.

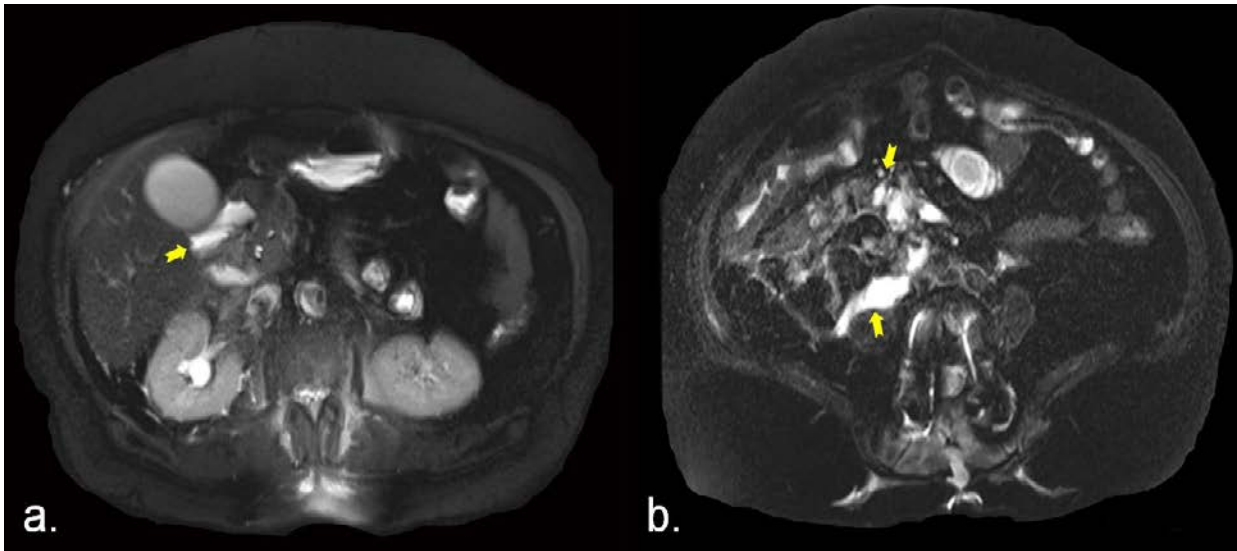


Figure 2. Axial T2 FS weighted images of the upper (a) and lower (b) abdominal cavity. The yellow arrows show the high signal intensity effusions distributing around the pancreatic head, along the right lateroconal fascia and between the bowel loops, respectively.



Figure 3. Coronal reconstruction of abdomen computed tomography images. The solid white arrow shows the edematous pancreatic head with the partially indistinct margins, whereas the blank arrow heads to the adjacent effusion accumulating to the weight-dependent part of the abdominal cavity.

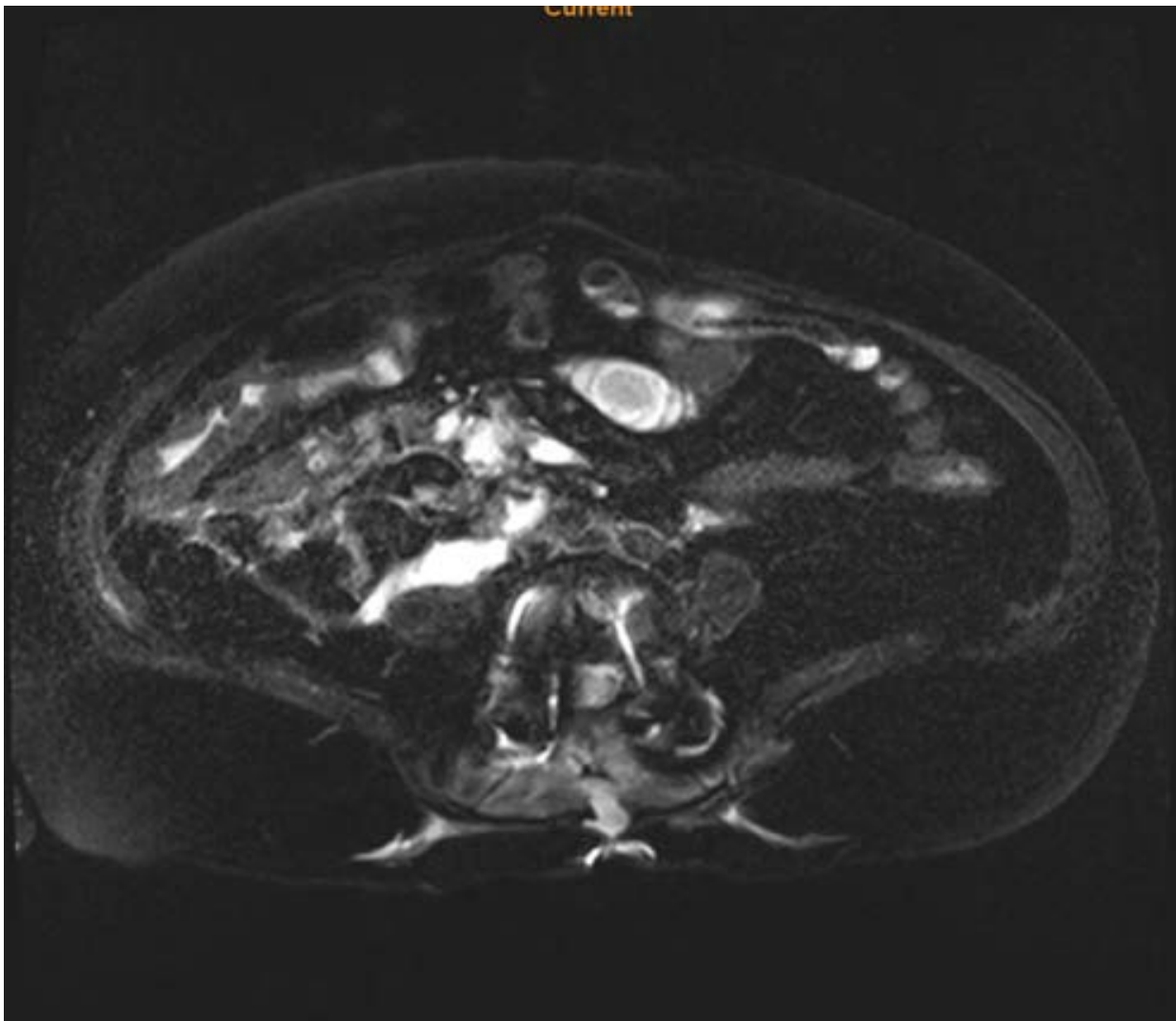


Figure 4. Axial view of MRI scan demonstrating reactive fluid collection and confirming the presence of pancreatitis.

Discussion

Acute pancreatitis following major spine surgery, though uncommon, remains a significant postoperative concern, as suggested by various studies (Table 2).

Ghisi et al. described a case of pancreatitis after a two-stage correction for right thoracic idiopathic scoliosis, managed successfully with conservative treatment [1].

Similarly, Tauchi et al. reported a case after L3-L5 posterior fusion with posterior lumbar interbody fusion (PLIF) for spondylolisthesis, with a positive recovery [4].

In a retrospective analysis by Leichtner et al. (1991), four cases of pancreatitis emerged among 44 patients undergoing one-stage posterior fixation for scoliosis, all of whom were treated conservatively [6].

Curtin et al. (1993) also noted a similar case after posterior fusion for spondylolisthesis [7].

An unusual case was described by Korovessis et al. (1996), involving combined anterior and posterior fixation for polio scoliosis, where the patient experienced multiple relapses despite conservative management [8].

Additional reports further illustrate how diverse surgical approaches and patient conditions can influence this complication.

Rajaraman et al. (2000) documented pancreatitis after anterior lumbar interbody fusion for degenerative spinal disease [9], while Farley et al. (2001) reported it following posterior spinal fusion from T4 to L3 for adolescent idiopathic scoliosis [10]; both patients recovered with conservative care.

Larger retrospective studies reinforced these findings. Laplaza et al. (2002) observed a 9% incidence of pancreatitis in 80 patients undergoing posterior spinal fixation for adolescent idiopathic scoliosis [11].

The highest rate, 30.1%, was reported by Borkhuu et al. (2009) in patients undergoing posterior spinal fusion for cerebral palsy [12].

He et al. (2004) identified five cases among 17 scoliosis patients treated with posterior fusion

[13], while Feng et al. (2018) found a 7.4% incidence in a prospective cohort of 176 scoliosis patients undergoing posterior fusion [14].

Table 2. Summary of patients with diagnosed pancreatitis from the studies included in our paper.

Summary of Studies with Cases Reported							
Study	Authors	Type of Study	Year	Nr of Cases with Post-op Pancreatitis	Preoperative diagnosis	Type of surgery	Outcome
[1]	Ghisi D. et al.	Case Report	2018	1	Right Thoracic Idiopathic Scoliosis	Two-Stage Correction	Conservative
[4]	Tauchi R. et al.	Case Report	2014	1	Spondylolisthesis	L3-L5 Posterior fusion+PLIF	Conservative
[6]	Leichtner AM et al.	Retrospective	1991	4 out of 44	One-stage Correction for Scoliosis	Posterior Fixation	Conservative
[7]	Curtin WA et al.	Case Report	1993	1	Spondylolisthesis	Posterior Fusion	Conservative
[8]	Korovessis PG et al.	Case Report	1996	1	Polio Scoliosis	Combined Anterior and Posterior	Conservative with multiple episodes of relapse
[9]	Rajaraman V et al.	Case Report	2000	1	Degenerative	Anterior Lumbar Interbody Fusion	Conservative
[10]	Farley FA et al.	Case Report	2001	1	Adolescent Idiopathic Scoliosis	Posterior Spinal Fusion T4-L3	Conservative
[11]	Laplaza FA et al.	Retrospective	2002	7 out of 80 (9%)	Adolescent Idiopathic Scoliosis	Posterior Spinal Fixation	Conservative
[12]	Borkhuu B et al.	Retrospective Cohort	2009	109 out of 355 (30.1%)	Spine Fusion with Cerebral Palsy	Posterior Fusion	Conservative
[13]	He Z et al.	Retrospective	2004	5 out of 17	Scoliosis	Posterior Fusion	Conservative
[14]	Feng F et al.	Prospective	2018	13 out of 176 (7.4%)	Scoliosis	Posterior Fusion	Conservative

In our report, the patient underwent posterior lumbar fixation and decompression for spinal canal stenosis without any intraoperative complications.

As described, the blood loss was within the expected limits.

A hypothesis regarding the cause of acute pancreatitis could be attributed to the increased BMI along with the patient's prone position, which could theoretically increase the abdominal pressure.

Conclusion

Sudden onset postoperative symptoms after major spine surgery should always be taken into consideration, especially in procedures that are correlated with a higher risk of abdominal complications.

Blood loss, deformity correction, syndromic patients, and medical history play an important role in the apparition of postoperative pancreatitis

Conflict of interest

None to declare.

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