

Intimal Injury of Abdominal Aorta Following Traumatic Spondylolisthesis in a Polytrauma Patient - A Case Report

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Abstract

Traumatic spondylolisthesis can involve lamina, pedicle, or facet fracture, but usually spares pars interarticularis. Traumatic spondylolisthesis causing cord injuries has been reported. Traumatic spondylolisthesis of L4 and L5 vertebra with spontaneous reduction causing intimal tear of abdominal aorta in a case of polytrauma patient is very rare and has been never reported. In this case report, we are presenting one such case which eventually led to gangrene of both lower limbs and death due to sepsis and acute renal failure.

Keywords: Spondylolisthesis, abdominal aorta, intimal tear, polytrauma.

Introduction

Traumatic spondylolisthesis can involve lamina, pedicle, or facet fracture but usually spares pars interarticularis [2]. Traumatic spondylolisthesis at L4 and L5 vertebra is one of the common causes for back pain [3,4]. Conservative management with adequate bed rest and braces will help for treatment. Spondylolisthesis causing cauda equina compression and subsequent paraplegia has been reported in the literature [2, 3, 4]. Paraplegia in such cases will be sudden onset. However, spondylolisthesis at L4-L5 level with spontaneously reduced vertebra causing compression at aorta causing intimal tear and slowly developing thrombus ultimately leading to complete occlusion is one rare entity and has not been reported in English literature.

Case Report

A 28-year-old adult presented to the casualty with a history of road traffic

accident within 30 min of accident. He was hit by a four-wheeler while traveling in a car. The patient sustained injury over the abdomen and both the lower limbs. At presentation, the patient was conscious and oriented. On examination, vitals were stable; the patient had diffuse tenderness over lumbosacral (LS) spine region, with no gross deformity of the spine with a contusion of skin. Pelvic compression and chest compression tests were negative. There was minimal ecchymosis over the lower abdomen region (Fig. 1). Right lower limb had laceration over lateral aspect of mid-thigh with abnormal mobility at mid-thigh. There were swelling and abnormal mobility at proximal leg also. Left lower limb showed swelling, abnormal mobility at mid-thigh, and proximal leg without any external wound in thigh. There was a lacerated wound anteriorly in the lower half of both the legs (Fig. 1).

Abdominal examination showed diffuse

tenderness without guarding. The dorsalis pedis and posterior tibial artery were present bilaterally at the time of

presentation. There was no active toe or ankle movement with loss of sensation. Our initial provisional diagnosis was traumatic paraplegia with fractures involving bilateral lower limb. Radiographs showed fracture shaft of the femur with ipsilateral neck of femur fracture with proximal tibia comminuted fracture on the right side. The left side showed midshaft femur fracture comminuted with comminuted proximal tibia fracture (Fig. 2). Abdominal ultrasound showed no solid organ injury or free fluid. LS spine radiographs showed lysis at L4-L5 vertebra with multiple transverse process fractures with spondylolisthesis (Fig. 3). The patient was planned for surgery after computed tomography (CT) and magnetic resonance imaging scans. On reexamination after 8 h of trauma, he showed absent distal pulses in both lower limbs. Emergency CT angiogram was done, and it showed complete occlusion of abdominal aorta at bifurcation at the level of L4 vertebra (Fig. 4). The patient was planned for immediate exploration by the team of cardiothoracic vascular surgery and planned for spanning external fixator on both sides by the orthopedic team. Intraoperatively, the infrarenal aorta and common iliac arteries showed

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Figure 1: Multiple wounds over the abdomen and bilateral lower limbs.



Figure 2: Radiographs showing fracture shaft of the femur with ipsilateral neck of femur fracture with proximal tibia comminuted fracture on the right side. The left side shows comminuted midshaft femur fracture with comminuted proximal tibia fracture.

thrombotic occlusion. Thrombectomy with aortobifemoral bypass grafting was done. Intraoperative assessment of L4–L5 vertebra was done under image intensifier, and since it was found stable, no fixation was done. Spanning knee external fixator was applied on both the sides. Due to anticipated compartment syndrome over lower limbs due to reperfusion, fasciotomy of bilateral thigh and leg was done. There were no immediate distal pulses felt after surgery. Postoperatively, the patient was kept in the Intensive Care Unit with ventilator support. The patient started showing features of acute renal failure from the 1st post-operative day with decreased urine output and increased renal parameters. On the 2nd post-operative day, urine output was nil and renal parameters were increasing for which dialysis was started. On post-operative day 3, the patient continued to have low urine output (10ml per day) and dialysis for second sitting was performed. Gangrenous changes were observed in both the lower limbs from the 3rd post-operative day onward. The patient was planned for above knee guillotine amputation but expired due to renal failure and sepsis on the 5th post-operative day.

Discussion

Traumatic spondylolisthesis usually involves fracture of pedicle, lamina, or facet barring pars interarticularis [2]. It has been said that traumatic spondylolisthesis involving laminar fracture is caused by extension and axial



Figure 3: Lumbosacral spine X-ray lateral view showing lysis at L4–L5 vertebra with listhesis.



Figure 4: Computed tomography angiogram showing the bilateral lower limb fractures and occlusion of the aorta at the level of bifurcation with fracture of L4. With lysis, with multiple transverse process fractures.

load combination injuries [2,3]. However, listhesis without involving lamina fracture is probably caused by flexion injuries. Such cases of traumatic listhesis causing cord injuries have been reported in literature [2, 3, 4]. Timing of decompression and severity of canal narrowing or cord injuries have been prognostic factors in determining neurological recovery. Early decompression promotes neurological recovery [4]. Traumatic spondylolisthesis as explained in literature usually results in cord injury. Such injuries causing aortic injury so far have not been reported in English literature. In this particular case, the patient was hit by something from the back while seated in a four-wheeler. There would have been possible hyperextension at lower spine causing listhesis at L4 and L5 level with laminar fracture. The LS spine radiograph done in casualty did not show any displaced spondylolisthesis as it might have spontaneously reduced. The CT scan done during angiogram showed a fracture of L4 vertebra with thrombosis of abdominal aorta. The traumatic

spondylolisthesis would have indented the abdominal aorta causing intimal tear, as the aortic bifurcation is in very close relationship with the L4 vertebra. This would have caused slowly developing thrombus at aortic bifurcation which progressed to full occlusion of the aorta after few hours. This was evidenced by the presence of distal pulses at the time of presentation to casualty. After 8 h of injury, we noticed the absence of distal pulses on both the sides. Immediate CT angiogram revealed complete occlusion of the aorta at bifurcation. Such incidences of traumatic intimal tear of arteries have been reported in the past. It is commonly seen in traumatic dislocation of the knee which got spontaneously reduced causing intimal tear which caused devastating results few hours after injury [9]. They have also been reported in renal artery following blunt trauma abdomen, popliteal artery following TKR [1], carotid artery following trauma [7], and coronary artery following angioplasty which needed bypass surgery later [8]. Most of these intimal tear will be benign

initially as they do not show any clinical signs of vascular injury. In our case also, the patient was presented with intact distal pulses at presentation to casualty. Full blown thrombus causing complete

occlusion of the aorta was seen after 8 after injury as evidenced by CT angiogram. Our case stresses the importance of repeat examinations of polytrauma patient at regular intervals

to check for distal pulses to prevent such late devastating problems. It may also enlighten the rare possibility of traumatic lysis at L4 vertebra causing aortic intimal injury.

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