



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 listheses causing cord injuries have been reported. Traumatic spondylolisthesis of L4 and L5 vertebra with spontaneous reduction causing intimal tear of abdominal aorta in a case of Polytrauma is very rare and to the best of our knowledge it 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.

KEY WORDS : Spondylolisthesis, Guillotine amputation, External fixator, Aortic bifurcation, Laminar fracture

Introduction

Traumatic spondylolisthesis can involve lamina, pedicle or facet fracture, but usually spares pars intrarticularis[1]. Traumatic spondylolisthesis at L4 and L5 vertebra is one of the common causes for back pain. Conservative management with adequate bed rest and braces will help for treatment. Spondylolisthesis

causing cauda equina compression and subsequent paraplegia have been reported in the literature[2]. Paraplegia in such cases will be of sudden onset. But 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 almost have never been reported in the English literature.

Case Report

A twenty eight year old adult male presented to the casualty with history of road traffic accident about 30 minutes back, hit by four wheeler while travelling in a car. There was a history of collision from back. The patient was seated in the back side of the car. Patient sustained injury over abdomen and both lower

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limbs. At presentation patient was conscious and oriented. On examination, vitals were stable, patient had contusion of skin with diffuse tenderness over LS spine region, and there was no gross deformity of spine. Pelvic compression and chest compression tests were negative. There was minimal ecchymosis over the lower abdomen region (Fig. No 1). Right lower limb had laceration over lateral aspect of mid thigh with abnormal mobility at mid thigh. There was 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 lower half of both the legs (Fig. No 1). Abdominal examination showed diffuse tenderness without much guarding. The Dorsalis pedis and Posterior tibial artery were present bilaterally at the time of presentation. But there were no active toe or ankle movement. Our initial presumption was traumatic paraplegia with fractures involving bilateral lower limb. After initial resuscitation, both the lower limbs were immediately splinted and patient was shifted for x rays. Radiographs showed fracture shaft of femur with ipsilateral intertrochanteric femur fracture with proximal tibia comminuted fracture on right side. The Left side showed midshaft femur fracture comminuted with comminuted proximal tibia fracture (Fig. No 2). USG abdomen showed no solid organ injury or free fluid. Lumbo sacral spine X ray showed lysis at L4 L5 vertebra with multiple transverse process fractures with listhesis (Fig. No. 3). Patient was planned for surgery after CT and MRI. On re-examination after eight hours of trauma 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 with the bilateral lower limb fractures (Fig.No. 4). Patient was planned for immediate exploration by the team of CTVS

and planned for spanning external fixator on both side by orthopaedic team. Intra op it was found out that the infra renal aorta and common iliac arteries showed thrombotic occlusion. Thrombectomy with Aorto-bifemoral bypass grafting was done. Intra op assessment of L4 L5 vertebra was done under C Arm and since it was found stable no fixation was done. Spanning knee external fixator was applied on both sides. Because of anticipated compartment syndrome over lower limbs due to reperfusion, fasciotomy of bilateral thigh and leg were done. There were no immediate distal pulses felt after surgery.

Fig.No. 1: showing external injuries in patient



Fig.No. 2: showing bilateral femur fracture and bilateral proximal tibial fracture, comminuted with right sided intertrochanteric fracture



Post operatively patient was kept in Intensive care unit and was continued to be ventilator support. General condition was poor with patient only being responding to painful

stimuli. Patient was maintaining vitals without any inotropic support. Patient started showing features of acute renal failure from post op day 1 with decreased urine output and increased renal parameters. On day one of surgery, urine output was 10ml/hour. Urea was 50mg% and creatinine was 2mg%. On post operative day 2, urine output was nil and urea and creatinine were increasing (urea-75mg% and creatinine 2.7mg %). Dialysis was performed on the same day. On post operative day 3, patient continued to have low urine output (10ml per day) and dialysis for second sitting was performed. Mean while there were features of necrotic changes over thigh and leg muscles more on right side compared to left on post operative day three. Patient was planned for AK guillotine amputation on right side and since general condition was poor surgery was deferred. Patient expired on day five due to acute renal failure and sepsis.

Fig.No. 3: Showing pars lysis at L4 L5 with multiple level transverse process fractures



Fig.No. 4: Showing CT angiogram showing complete occlusion of aorta at bifurcation at L4 vertebral level with bilateral femur , tibia fracture



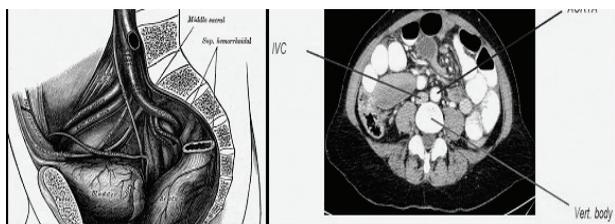
Discussion

Traumatic spondylolisthesis usually involves fracture of pedicle, lamina or facet barring pars interarticularis. It has been said that traumatic spondylolisthesis involving laminar fracture is caused by extension and axial load combination injuries[3]. But listhesis without involving lamina fracture is probably caused by flexion injuries. Such cases of traumatic listhesis causing cord injuries have been reported in literature[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 has not been reported in English literature. In this particular case, patient was hit by something from back while seated in four wheeler. There would have been possible hyperextension at lower spine causing listhesis at L4 and L5 level with laminar fracture. Interesting in this case probably it was spontaneously reduced because when we took X ray in casualty we did not notice any gross spondylolisthesis. We assume that this listhesis, at the time of trauma would have indented the abdominal aorta causing intimal tear. The Aortic bifurcation is in very close relationship with the L 4 vertebra (Fig.No. 5). At the Aortic bifurcation pressure oscillations and possible turbulence may be set up as a result of differences in the luminal diameters of the Common Iliac arteries and so give rise to reflected waves that may injure the intima of distal abdominal aorta. This intimal tear in turn would have caused slowly developing thrombus at aortic bifurcation which got full blown only after eight hours post injury. This was evidenced by presence of distal pulses at the time of presentation to casualty. Our initial impression was 'traumatic paraplegia' as patient had no toe or ankle

movement. After eight hours of injury we noticed absence of distal pulses on both sides. Immediate CT angiogram revealed complete occlusion of aorta at bifurcation.

Fig.No. 5: Showing relationship of aortic bifurcation with L4 vertebra



Such incidences of traumatic intimal tear of arteries have been reported in past. It is commonly seen in traumatic dislocation of knee which got spontaneously reduced causing intimal tear which caused devastating results few hours after injury[5]. They have also been reported in renal artery following blunt trauma abdomen, popliteal artery following TKR, carotid artery following trauma[6], coronary artery following angioplasty which needed bypass surgery later[7]. Most of these intimal tear will be benign initially. In our case also, patient presented with intact distal pulses at presentation to casualty. Full blown thrombus causing complete transaction of aorta was seen after 8-9 hours after injury as evidenced by CT angiogram. Aorto-femoral bypass grafting was done by the team of cardiothoracic surgeon. Bilateral spanning fixator was applied for floating knee as part of damage control Orthopaedics[8].

But unfortunately the patient developed acute renal failure and gangrene of the lower limb. In spite of our continued resuscitation and treatment the patient expired. Our case stresses the importance of repeat examinations of poly trauma patient at regular intervals to check for distal pulses to prevent such late devastating problems. It may also enlighten the rare possibility of traumatic listhesis at L4 vertebra causing aortic intimal injury.

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