

Case Report

Endovascular Treatment for Traumatic Thoracic Aortic Injury: A Case Report

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Abstract

As majority of blunt traumatic injury with aortic tear die, we see limited numbers of survival in the hospital. Thoracic endovascular treatment for traumatic aortic injury is rare. Endovascular treatment, where available, is the trend for traumatic aortic injury for all age group. Both morbidity and mortality are significantly decreased with endovascular intervention. Twenty nine years old male patient driving a car collided with truck and had thoracic aortic pseudoaneurysm with multiple skeletal fractures that underwent successful endovascular stent graft along with fixation of all fractured bones.

Key words: Endovascular stent graft, Thoracic aortic injury, Thoracic aortic pseudoaneurysm, Thoracic endovascular aortic repair

Introduction

Blunt traumatic thoracic aortic injury is associated with high mortality rate and this has been placed in second most common cause of death in trauma patients^{1,2}. Fifty percent of traumatic aortic injury (TAI) die within 24 hours even after diagnosis in hospital³. Open repair with high posterolateral thoracotomy has been associated with significant mortality and paraplegia. Thoracic endovascular aortic repair (TEVAR) is upcoming therapy for thoracic aortic pathologies.

Case report

A 29-year-old male was driving a car and was hit by a truck coming from opposite direction. He had transient loss of consciousness and taken to nearby hospital. After resuscitation, he was transferred to our center. His pulse rate was 84/min regular, respiratory rate was 14/min and a blood pressure was 130/90 mm of Mercury when received in emergency department. He was fully awake with full coma scale. He came with reports of skull, chest, pelvis and all extremities X-rays. Chest (Fig 1)

and pelvic X-rays were normal. There were fractures of mandible, shaft of left humerus, Galeazzi fracture of left forearm and bilateral shaft of femur fractures. This shows the force of vehicle collision with serious injuries.

Further imaging included CT scans of brain, cervical spine, chest, abdomen and pelvis. CT angiogram of whole aorta was ordered and this revealed pseudoaneurysm 12 mm distal to the take-off of left subclavian artery (Fig 2). The patient was admitted in ICU and managed with keeping blood pressure in lower range.

We opted for TEVAR for this case. As we didn't have stents in shelves and not very regular in aortic endovascular procedure, it took couple of days to order appropriate sized stent. In the mean time orthopedic surgeon plated right humerus and left radius bones. They nailed both fractured femurs. Patient was stable throughout the procedure.



Figure 1 Chest X ray looks normal

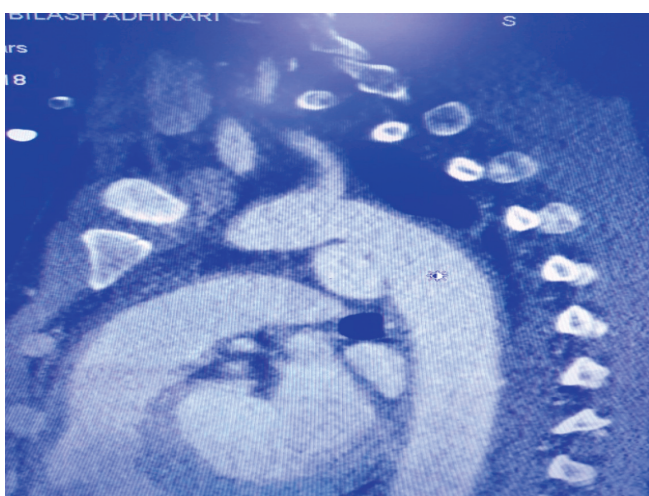


Figure 2 CT aortogram depicting pseudoaneurysm distal to left subclavian artery

After two weeks from injury we were able to manage gadgets for TEVAR. As the patient was young we decided to go for hybrid procedure. He was taken to operating theater and under general anesthesia we did left common carotid to distal left subclavian side to side bypass using 7 mm polyester graft. As we didn't have hybrid operating theater, patient was shifted to cath lab and stenting was continued.

Our access sites were right common femoral artery and left brachial artery. The aneurysm was starting from 17 mm distal to take-off of left common carotid artery and diameter there was 26 mm (Fig3). We deployed Medtronic Valiant Captiva of 32 mm x 32 mm with 100 cm length. From left brachial we used vascular plug to block proximal part of left subclavian artery though we didn't see type II leak. The completion angiogram was satisfactory (Fig 4). After 3 days plating for mandibular

fracture was done by dental surgeon and patient was discharged after a week from TEVAR.



Figure 3 Angiogram showing pseudoaneurysm distal to left subclavian artery

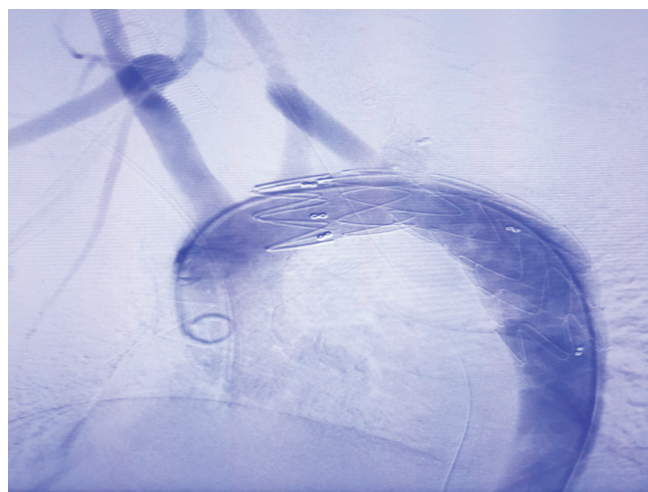


Figure 4 Completion angiogram showing graft from left common carotid artery to left subclavian artery and coverage of leak by stent.

Discussion

Open surgical repair remains traditional treatment for TAI, but TEVAR is coming up with significantly decreased morbidity and mortality. TEVAR is minimally invasive approach that does not require thoracotomy, aortic cross clamping and cardiopulmonary bypass⁴. Although any segment of the aorta can be at risk, most blunt aortic injuries occur in the isthmus, where

relatively mobile aortic arch moves away from fixed descending aorta during sudden deceleration⁵.

As the patient was stable we needed to wait for two weeks to get the gadgets from abroad, but we opted for TEVAR than going for open surgery. In our case, aneurysm was starting from 17 mm distal to left common carotid artery and we needed 15 mm landing zone for Valiant Captiva. This is the reason we needed to block the left subclavian artery by stent. Patient was young so that we opted for left common carotid to left subclavian artery bypass. Society of Vascular Surgery Practice Guidelines tells revascularization of subclavian artery should be individualized⁶.

Conflict of interest: None declared.

References

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