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RESEARCH ARTICLE

CASE REPORT: A WORK PLACE RELEATED UNSTABLE LEFT SUBCLAVIAN ARTERY INJURY FOLLOWING PENETRATING TRAUMA

***[1]Ahmad Ishfaq, [1]Bulusu Radhika and [2]Kole Tamorish**

[1]Institute of Emergency Medicine, Medeor Hospital, IMT Manesar, Gurgaon Haryana
[2]Chairman, Institute of Emergency Medicine, Medeor Hospital, IMT Manesar, Gurgaon Haryana

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****Corresponding author:*** **Ahmad Ishfaq**

ABSTRACT

Subclavian arteryinjuryis uncommon as it is protected by the subclavius muscle, the clavicle, the first rib, and the deep clavicle fascia, as well as the costo – coracoid ligament, a clavi – coraco - axillary fascia portion[1]. It is a challenging complication of blunt and penetrating trauma. Physical examination of the upper limb, as well as diagnostic imaging techniques like Contrast CT are of diagnostic importance. While arteriography offers both a diagnostic as well as a therapeutic approach. Immediate identification and emergent repair of an injured subclavian artery, is of utmost importance as arterial rupture could be life – threatening as well as limb – threatening.

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INTRODUCTION

A 29 year old male was brought to the emergency deparment (ED) with alleged history of work place related glass cut injury over his left clavicular region. In ED, he was hemodynamically unstable, with a heart rate (HR) 114/minute, Blood Pressure (BP) of 80/40 mmHg and SpO2 92% (on room air) and 100% (with (15 lit/min oxygen support). Primary survey releaved, a 4.5 x 1cms Lacerated wound over the left clavicle, which was actively bleeding and patient was had reduced air entry on the left side of his chest on ausculation. In view of these finding, pressure bandaging of the wound was immediately done and supportive treatment was initiated with fluid bolus, analgesics and inj tranexamic acid (1gm). Blood gas analysis revealed a base deficit of -3.3 mmol/L, which suggestive of Grade 2 hemmorrhagic shock. Massive transfusion protocol was initiated in a ratio of 1:1:1.Bedside Chest X-Ray revealed left Hemo-pneumothorax. Secondary survey was within normal limits. General and Vascular Surgery teams were consulted. Patient was not responding to fluid boluses and ongoing transfusions as repeat blood gas analysis revealed metabolic acidosis, worsening of his hemorrhagic shock to grade 4 with a base deficit of -10, and a fall in his hemoglobin level from a initial of 12 g% to 4.5 g%. Patient was planned for a CT – Angio, but was deffered due to worsening vitaals and hemoglobin. Intercostal chest drain (ICD) was inserted on left, clammped, patient was shifted to the OT for urgent exploration and repair of the left subclavian artery. On Exploration, a rent was located on the posterior wall of the left subclavian artery and was repaired. However, intra – Operatively, ICD clamp was opened and following which patient's went into cardiac arrest. Return of Spontaneous Circulation (ROSC) was achieved after one cycle of CPR. 4 units of Packed Red Blood Cells (PRBC) were further transfused and post- operatively patient was shifted to the Intensive Care Unit. On post- operative Day 2, Patient's hemodynamics improved and he was extubated and the inotropic support was gradually tapered off. ICD was removed on post- operative Day 3 in the ICU. Following which, on post – operative Day 5, Surgical Emphysema was noted around the wound site. In view of this finding, HRCT – Chest was done, which was suggestive of sub-cutaneous emphysema on the Left side with Left Hydro – Pneumothorax and Pleural effusion. Therefore, ICD was re – inserted on the Left side.

Hemothorax

Patient was subsequently discharged in a stable condition with Chest- Tube in – situ on Day 8 with follow- up advice.

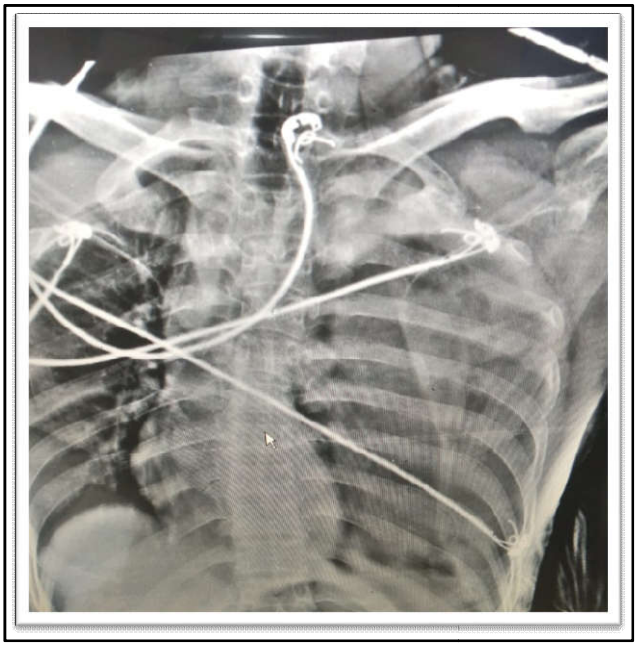

Figure 1. Plain Chest X- Ray Showing Hemothorax

Figure 2. Plain Computed Tomography of the Chest

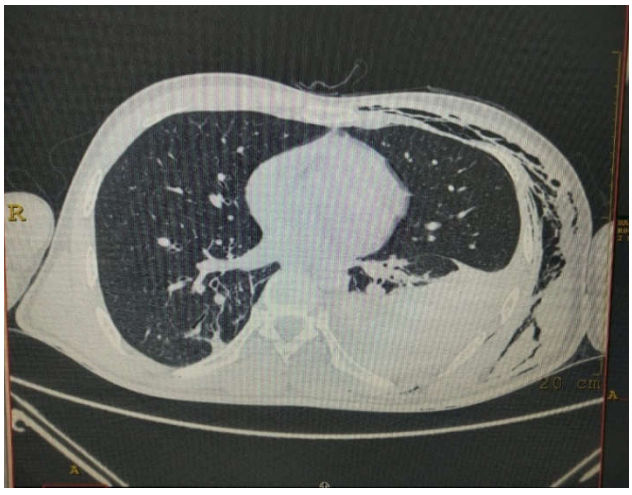

Figure 3. Plain Computed Tomography of the Chest

DISCUSSION

Subclavian artery injuries account for only 2 to 5 % of acute vascular injuries and an overwhelming majority of these injuries are from penetrationg trauma (Barão, 2015). A history of blunt trauma with a bony injury to the clavicle or the first rib might result in injury to the subclavian artery. Physical examination of the upper limb is crucial in subclavian artery injury and should focus on skin colour, temperature, hand motility and pulsations. Most of the patients with subclavian and axillary artery injuries show signs of arterial insufficency of the upper extremities. However, due to the extenxive collateral circulation of the upper extremities, patients might have palpable distal pulsations (Robert, 1986). In the series reported by Schaff and Brawley of the 15 patients with injuries to the subclavian and axillary arteries, 8 patients (53%) had easily palpable distal pulses (Robert, 1986 and Schaff, 1977). A contrast enhanced CT is important in diagnosing, as it helps reveal the site and extent of the lesion (Barão, 2015). In our patient it was deferred after discussion amongst the treating physicians, taking into account our patient's hemodynamical unstability. A selective arteriography is also helpful as it offers diagnostic accuracy as well as helps with the surgical planning (Assenza, 2012). Surgical repair should be planned and executed on an emergent basis, as the mortality and morbidity associated with subclavian artery injuries is high. Surgical exposure for the treatment itself is also chanllenging and treacherous and carries a risk of high morbidity (Barão, 2015 and Demetriades 2001). The approach can be either supraclavicular by thoracotomy, median sternotomy or by combined access for larger exposes (Barão, 2015). With advances in endovascular devices technology, more anatomically difficult lesions can be repaired using an endoluminal approach (Barão, 2015). The endovascular approach has been established as a feasible and beneficial technique (Barão, 2015).

Conclusion

In our patient (hemodynamics deteoriation occurred despite pressure bandage, fluid bolus and massive transfusions. Patient could not be shifted to CT Angio (Gold Standard) due to worsening hemodynamics. Mobolization of surgical teams and shifting for vasular repair was corner-stone of survival and successfull outcome. Penetrating injuries of the subclavian artery are associated with high morbidity and mortality along with multiple concomitant injuries and hemodynamically unstable vitals upon presentation. Rapid identification of the subclavian vessel injury with use of radio-diagnostics, if permissible and available should be done. Early Surgical repair of the subclavian artery should be done, as it is a potentially fatal injury.

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