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Case Report

A Rare Case That Subclavian Artery Rupture With Minor Trauma: Case report

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Abstract: Traumatic subclavian artery rupture (TSAR) is rarely seen as a result of blunt thorax trauma but it is a high cause of mortality and morbidity. Subclavian artey injuries developed after a blunt trauma vary from 1 to 5 % in many medical centers. Objective of this case report was to review the literature information of TSAR in the light of the cases with detected TASR following minor trauma.
Keywords: Traumatic subclavian artery rupture (TSAR), Minor Trauma.

INTRODUCTION

Subclavian artery is protected by subclavian muscle, clavicle, first costa, cervical fascia, costa-coracoid ligament and some part of clavi-coraco-axiller fascia. Usually Penetran injury results from penetrating injuries and 50% of the time clavicle fracturesare seen in subclavian artery injuries. Traumatic subclavian artery rupture (TSAR) is rarely seen as a result of blunt thorax trauma but it is a high cause of mortality and morbidity [1-3].

Subclavian artery injuries are vascular pathologies which are acconted for only 2 % of all the acute vascular injuries. Subclavian artey injuries developed after a blunt trauma vary from 1 to 5% in many medical centers [4]. Only %15 of people who are injured, arrive alive to the medical centers [3]

In our literature screening, no subclavian artery injury which is ensued from minor trauma was encountered. Objective of this case report was to review the literature information of TSAR in the light of the cases with detected TASR following trauma.

CASE REPORT

A 44 years old woman who had complaints of sudden shortness of breath and back pain and brought to the medical center by her relatives. Her Glasgow Coma Scale (GCS) score was 7. Arterial blood pressure was measured as 50/30 mmHg in the right and 105/65 mmHg in the left arm. Her pulse was found as 150 beats per minute, respiration rate as 26 per minute, finger oxygen saturation as %58 and, she got cold sweats. Pathological reflex neurologic deficit were not observed in the patient who had positive pupillary isochoric and bilateral light reflex. No pulmonary sound was heard in the left hemithorax and there were thin rales in the middle and upper zones. No pathology was determined by other examinations. Arterial blood gas was pH:7.08, pCO2:35.1, pO2:50. Due to her bad general condition, rapid sequence intubation was carried out. According to her medical history, she had no chronic ilness but she had an accident a week ago. She felt down from a chair and had short blackout after trauma. Bedside chest x-ray wasn't clear because of the technique but still fluid appearance in left hemithorax was noticed. 8cm thick pleural effusion in left hemithorax (Fig. 1) and icy glass appearance in left perihilar zone was seen in contrasted thorax and abdomen tomography which was taken considering aortic dissection (Fig. 2). Secondary mediastinal structures of Pleural effusion was appeared as displaced towards right. Main vascular structures and heart size were in normal range. Laboratory outcomes were found as Hgb:10.02/dL, HTC: %31.65, PLT:294000/uL, Glucose:241mg/dL and Urea/Crea:39/1.43mg/dL. Post-intubation pH:7.24, pCO2:32.7, pO2:225 values were found in the arterial blood gas. Needle aspiration was applied to the left hemithorax of patient. It was consolidated with Cardiovascular surgery clinic due to hemorrhagic fluid discharge. Because of 1000 ml of hemorrhagic fluid discharged in an hour in the patient who received tube

thoracostomy, 2 units of erythrocyte suspension replacement has initiated. Patient who had control Hgb:8.13g/dL, Htc: 24.83% and PLT:288000/uL underwent aoart angiography in the Cardiovascular surgery clinic. In this session, PTFE graft was implanted due to detection of contrast material leakage in the subclavian artery. Patient's general condition was stabile at her follow-ups. On the third day 1000ml hemotam was discgarhed by surgical intervention of thoracic surgery clinic. Patient who had stabiled vital signs, had no active bleeding and expansed lungs was discharged from the hospital with the recommendations of compliance to the policlinic follow-up schedules.

Fig. 1: Pleural effusion in left hemithorax on thorax CT

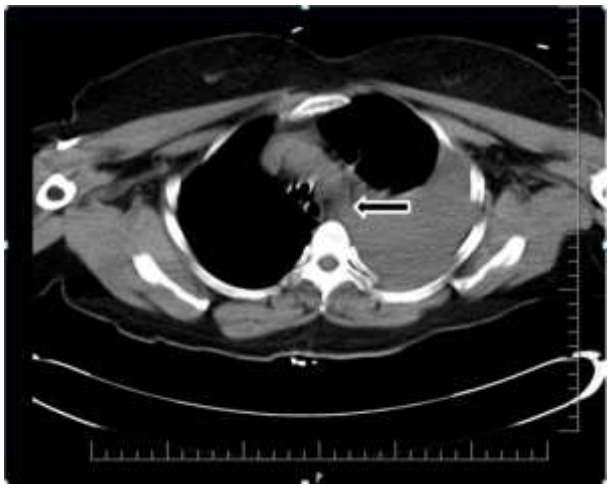

Fig. 2: Icy glass appearance in left perihilar zone on contrasted thorax CT

DISCUSSION

Traumatic subclavian artery rupture (TSAR) is rarely seen in thorax traumas. Incidence of TSAR was stated as 0.4% in a study by Rulliat *et al*. with 1.181 patients having thoracic traumas [5]. Whereas, Shalhub *et al*. reported an incidence of 47% for subclavian artery rupture among all the blunt-trauma thoracic artery injuries [6].

In a study with 94 patients presented to the hospital due to innominate artery rupture developed after blunt-trauma, 82 patients were diagnosed in the period following trauma, but 12 of them were diagnosed in a late period such as 10 days after trauma [7, 8]. As it can be seen in our case also, this supports that subclavian artery injuries can be detected in late period after trauma.

Medical care of trauma patients should include systematic triage, primary and secondary appraisal, resuscitation, diagnosis and therapeutic attention. During the secondary evaluation of trauma patients, extremities and peripherial pulsation should be carefully evaluated [9].

Considering the clinical picture and physical examination symptoms of trauma patients, it could be known if there is any arterial injury. TSAR is usually seen in early stages and it can appear with life-threatening bleeding compression on the brachial plexus [1]. Clavicular fracture is also accompanies with a rate of 50% [10]. Findings such as the colour, heat and sense of upper extremities, radial pulsation and hand mobility should be checked in the physical examination [5]. Failure to obtain pulse in arterial injuriesthrill in the injury area, murmur and hematoma can be seen. In general; bone, nerve or respiration illness can be found in patients who had subclavian artery injury [3]. Hemothorax, pneumothorax, clavicle, scapula fractures, neurologic destruction and brain damages can seen together in injury of subclavian artery [11]. Our patient had Hemothorax.

In diagnosis of TSAR, Sturm and Cicero suggested to take into account these examination citeria: first costa fracture, low or no radial pulse, palpable hematome symptom in supraclavicular area, mediastinal mass in chest x-ray or hematoma in lung and brachial plexus palsy [1, 2, 12].

Peripheric pulse should be checked carefully and, nerve and motor examinations should be done. Arterial injuries should be ruled out with diagnostic imaging methods in case of clinical suspicion. Colour, heat and sense of upper extremities, hand mobility and radial pulsation must be evaluated.Although failure to obtain a pulse is encountered as a constant finding in vein injuries, peripheric pulse can be considered depending upon area of injury and collateral quantity in subclavian artery injuries [3].

TSAR emerges as a result of extension, stretch or laceration mechanisms. TSAR developed as a result of a blunt trauma is related to a strong traumawhich was enforced to to theshoulder or clavicle. As a result of this strong trauma, a high-tension occurs and it can cause a rupture in the proximal of subclavian artery. TSAR usually emerges as a result of direct effect of fractured

bone pieces which was a result of clavicle or costafracture. TSAR was stated to be caused by Clavicle fracture by 50%. Subclavian artery injuries which are occured during the iatrogenic cathetering and penetrating trauma are known [1, 2]. Another mechanism is loosely worn seatbelts in car accidents. At the time of the a strike, shoulder stays still owing the seatbelt, but the body continues to go forward which cause an injury [11].

Our case is a unique patient in the literature because presentation following the minor trauma with lack of any bone fracture and presentation to the to the hospital after a long duration like a week later of the incidence. Our patient remarked that she had a syncope after she felt offof a chair. This is a reason why she can't tell clearly about falling mechanism.This was the reason of she could not explain her fall. After falling, she might want to hold somewhere with her upper extremity and exposed to a high-tension to the upper extremities. We think that syncope occured by stimulation of nervus vagus which was a result of pain and tension that composed the injury.

Plain X-ray is the first diagnosis modality in patients having a proper hemodynamic condition in whom vein injuries were considered.However; opacity, clavicular or first costa fractures and,pathologies of the lung and mediastinum yiel indirect findings.

The diagnostic method of choice is angiography, even the contrasted tomography is used too often in patients with suspected TSAR [1, 2, 12]. While deciding to an angiography, patients' hemodinamic condition and response to volume replacement should be considered. An angiography is suggested if patient is stabile, trauma is blunt and there is a response to volume replacement [4]. Hemorrhage finding was observed in our case on the chest X-ray. While a clear diagnoses could not be observed on the contrasted thorax x-ray, indirect findings of artery injury were obtained. Definitive diagnosis was setthrough the angiography.

In the literature research of the last 24 years; it was seen that 750 subclavian artery injuries was reported in 12 different studies and 79 patients (10.5%) underwent endovascular repairments, while endovascularrepairment was applied in only 5 of 56 cases due to blunt traumas. While endovascular treatment was applied in only 8 of 569 cases between 1988 and 2000, this treatment method was performed in 71 of 181 cases between 2000 and 2012 [13-15]. So this shows us that endovascular treatment is coming into prominence in subclavian artery injury cases.

Angiography is the most important method in diagnosis and treatment of TSAR. The rate of mortality in artery repair by open surgical intervention (Thoracotomy), is higher than in endovascular treatment [1, 2]. Endovascular treatment was applied succesfully in our case.

CONCLUSION

Systemic medical examinations should be applied to every patient who apply to Emergency Department with trauma even with a low severity of trauma. Extremity, pulse condition, sense and mobility examinations must be done carefully in systemic medical examination. Even if it is a minör trauma, it should be considered that there can be life-threatening pathologies. Especially if there is suspicion, advanced scanning modalities must be applied.

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