Case Report

Diagnosing aortic dissection using point of care ultrasound

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ABSTRACT

Aortic Dissection is a life-threatening condition that requires prompt diagnosis and management. Patients may have atypical presentations and 4.6-4.4% of aortic dissections are painless. The diagnosis is usually established by either computed tomography angiography, magnetic resonance angiography or transesophageal echocardiography. Point of care ultrasonography (POCUS) is a rapid method of diagnosis that is underutilized in current clinical practice. This case report highlights the important role of POCUS to obtain a timely diagnosis.

1. Introduction

Aortic dissection is an intimal tear that creates a true or false lumen. The incidence varies from 5 to 30 cases per million annually. It is three times more common in men than in women [1]. Mortality is extremely high, ranging from 20 to 30%, the risk being the highest in the first 10 days [1]. Since the presentation is diverse and the repercussions devastating, it is crucial to make a timely diagnosis. Through this case report, we aim to emphasize the importance of making a prompt diagnosis of a painless aortic dissection using point of care ultrasound.

2. Case report

An 84-year-old male with a past medical history of hypertension and diabetes mellitus presented to the hospital with progressive dyspnea, altered mental status and hematuria. The patient did not have any fevers, chills, cough, night sweats or weight loss. He denied having any chest pain or abdominal pain. On examination, his blood pressure was 84/46 mmHg, pulse 62 beats per minute, respiratory rate 22 breaths per minute and he had an elevated jugular venous pressure. Bilateral pitting pedal edema extending up to the thighs was prominent and his liver was enlarged. Breath sounds were decreased in bilateral lung bases whereas heart sounds were normal. He was afebrile and unable to move his right lower and left upper extremities on command. On admission, pertinent laboratory findings revealed a hemoglobin of 7.8 g/dl, hematocrit 24.1%, urea nitrogen 115 mg/dl, creatinine 1.7 mg/dl, phosphorus 6.3 mg/dl and an estimated glomerular filtration rate (eGFR) 38 ml/min/1.73m2. A urine analysis demonstrated proteinuria 3+ and hemoglobinuria 3+. His brain natriuretic peptide (BNP) and troponin levels were elevated, 280 pg/ml and 1.07 ng/ml, respectively. A bedside ultrasound was performed to establish the cause of hypotension and dyspnea. Point of care (POC) ultrasound (POCUS) showed bi-atrial enlargement with a preserved left ventricular function, dilated right ventricle and a plethoric inferior vena cava without respiratory phase variability. In addition, POCUS showed bilateral anechoic space consistent with moderate-large sized pleural effusions and presence of an abdominal aortic dissection extending up to the level of the renal artery (Clip 1 and 2).

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A contrast-enhanced chest computed tomography was performed, which confirmed the presence of aortic dissection extending from ascending aorta to the bilateral renal arteries (Figs. 1 and 2). A non-contrast computed tomography scan of the head was conducted to evaluate altered mental status and weakness which demonstrated multiple cerebral and cerebellar strokes.

3. Discussion

This patient had an extensive aortic dissection causing stroke, hematuria, and renal failure. In this case, POC ultrasound played a crucial role in making a unifying diagnosis and guided appropriate management. Although a well-established entity, aortic dissection is associated with life-threatening complications, especially if untreated. The diagnostic challenge in this case was the lack of the classic symptom of chest pain. According to retrospective reviews, about 4–6.4% of aortic dissections are painless and are associated with higher mortality rates [3,4]. Imaging modalities include magnetic resonance (MR) angiography, computed tomographic (CT) angiography and multiplane transesophageal echocardiography (TEE). The International Registry of Acute Aortic Dissection reviewed 464
patients (mean age 63, 65.3% male), among which 62.3% had a Type A dissection. The study highlighted that an initial chest X-ray and an echocardiogram did not prove to be helpful often, as no abnormalities were detected in 12.4% and 31.3% of patients, respectively. Computed tomography was the initial imaging modality that was used in 61.1% of patients [5]. In a study comparing MR angiography and TEE, both were found to be highly sensitive in diagnosing acute and sub-acute aortic dissection. However, TEE was less specific in diagnosing ascending aortic lesions [6]. A multicenter study evaluating the role of echocardiography described that an assessment of the aorta could be made in under 15 minutes (sensitivity 99% and specificity 98%), with difficulty occurring only in a few type II dissections requiring additional imaging modalities [7]. However, our case report demonstrates how a prompt diagnosis of dissection was made using POC ultrasound.

4. Clinical course

Vascular surgery consult was called to repair aortic dissection. However, family declined any surgical intervention and requested comfort measures only. Transition to comfort care measures was initiated and he passed away two weeks later.

5. Clinical pearls

- Acute aortic dissection is a surgical emergency requiring prompt diagnosis and treatment.
- Diagnosing a painless aortic dissection can be challenging and the diagnostic delay contributes to higher mortality rates.
- A point of care ultrasound can be key in making a prompt diagnosis of acute aortic dissection.

Ethical publication statement

We confirm that we have read the Journal’s position on issues involved in ethical publication and affirm that this report is consistent with those guidelines.
Clip 2. Point of care ultrasound demonstrating cross-sectional views of abdominal aortic dissection.

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Declaration of competing interest

None of the authors have any conflict of interest.

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