

RAPID ECHOCARDIOGRAPHY IN THE PRIMARY ANGIOPLASTY ERA FOR TIMELY DETECTION AND MANAGEMENT OF ACUTE STANFORD TYPE A AORTIC DISSECTION - A CASE ILLUSTRATION

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Introduction:

Acute Stanford Type A Aortic Dissection [ATAD], comprising two-thirds of all captured aortic dissections [AD] in the International Registry of Aortic Dissection [IRAD] series, is a life-threatening cardiothoracic emergency [1]. In-patient mortality without surgical intervention is approximately 50-60%, reducing to 18% with timely operative management [2]. Presentation is with cardiac chest pain [CCP] sometimes in conjunction with neurological, abdominal or peripheral vascular symptoms. ECG ischaemia and elevated troponin are often seen, precipitating initial management as acute coronary syndrome [ACS]. We describe two cases of Cardiac Catheter Lab [CCL] activation for presumed ST-elevation myocardial infarction [STEMI], where rapid echocardiography clinched diagnosis of ATAD and allowed timely transfer for life-saving surgical intervention.

Materials and methods: Case series

Case 1:

A previously fit 50-year old male presented with CCP, inferolateral T-wave inversion and high sensitivity troponin-T of 646ng/L. Treatment for ACS including dual-antiplatelet therapy was commenced. On-going chest pain despite high dose morphine triggered repeat ECG, demonstrating dynamic inferolateral ST elevation and led to CCL activation, though bilateral blood pressures and transthoracic echo [TTE] were also advised. These revealed a 30mmHg BP differential and a large dissection flap prolapsing into the ventricular outflow tract causing free aortic regurgitation [AR] (figure 1). CT Aorta (figure 2) was performed and the patient transferred directly to theatre at the regional cardiothoracic centre within 90 minutes of echo diagnosis. He underwent aortic repair and mechanical aortic valve replacement [AVR].

Case 2:

A 69-year old male with hypertension and hypercholesterolaemia, suffered severe CCP. Paramedic ECGs demonstrated widespread malignant ST-depression with ST-elevation in AVR, suggestive of critical left-main stem disease triggering CCL activation. Whilst preparing for emergent angiography, revisit of clinical history revealed symptoms of transient visual disturbance at onset of chest pain and examination findings included a loud holodiastolic murmur. Rapid TTE was performed showing dilated aorta (5.8cm) with mobile dissection flap intermittently compromising coronary ostia alongside free AR. Immediate onward transfer to cardiothoracic theatre occurred. At operation, dissection involvement of the left main ostium was observed, and treatment was with a 32mm aortic interpositional graft.

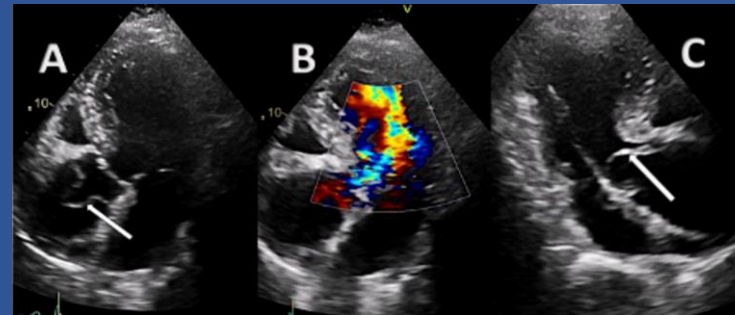


Figure 1 Aortic dissection detected by TTE

A. Aortic root dissection flap, B. Colour flow showing severe aortic regurgitation jet
C. Dissection flap prolapsing into left ventricular outflow tract

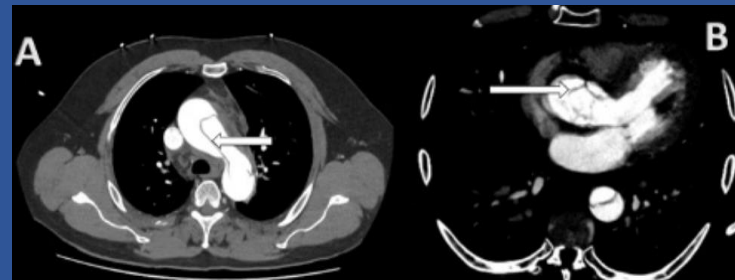


Figure 2. CT images showing type A aortic dissection

A. Dissection flap seen across the aortic arch, continuing into descending aorta
B. Dissection flap seen in the aortic root intermittently compromising coronary ostium

Discussion:

Annual incidence of AD is rare, reported at 4.4 per 100,000 person-years [3]. Misdiagnosis of AD for ACS is unsurprising given the incidence of the latter is significantly higher, reported at 234 per 100,000 years [3]. A recent study characterizing aortic syndromes reported presence of aortic insufficiency and coronary ischaemia in 18.2% and 6.5% of all AD cases, respectively. Further, though CT was the primary modality of diagnosis (68.8%), echocardiography was successfully utilized in 16.9% [4]. Study of TTE versus CT Aortogram for diagnosis of ATAD demonstrates accuracy, speed and ease of use of TTE and notes the value of additional information pertaining to complicating features of ATAD such as aortic insufficiency and cardiac tamponade [5].

Conclusion:

Utilization of rapid TTE in the CCL prior to emergent angiography in ACS presentations where clinical suspicion for AD is triggered, can allow early detection of ATAD, prevent detrimental coronary angiography and expedite appropriate life-saving operative intervention.

References

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