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Ventricular rupture is a rare but life threatening emergency after blunt chest trauma with a 60-80% mortality prior to hospital arrival¹. We will discuss the role of perioperative echocardiography among the many other imaging modalities available in the diagnosis and management of blunt cardiac trauma. We report a case with an atypical mechanism of ventricular rupture that highlights the utility of echo for the rapid diagnosis of left ventricular rupture.

A previously healthy teenage male presented to our children's hospital ER with tachycardia and chest pain, after being tackled by a security guard at school. After arrival an EKG showed inferior lead ST elevation and a troponin elevation. Transthoracic echocardiography (TTE) revealed a significant myocardial tear extending from the apical to the mid LV free wall. During intraoperative emergent repair, transesophageal echocardiography (TEE) showed a worsening LV rupture with only an epicardial pseudoaneurysm protecting the patient from impending massive pericardial effusion and tamponade. An esmolol infusion was used to control a hypertensive and tachycardic patient.

Echo, while not an appropriate primary screening tool in suspected blunt cardiac trauma, is of the utmost importance after an abnormal EKG and/or elevated troponins³. TEE appears to have an advantage over TTE due to improved image quality, and better imaging of the thoracic aorta leading to a decreased time to surgery⁴; however, TEE requires an appropriately sedated patient. While cardiac MRI can give very accurate detail of the type of injury to the myocardium, it requires managing a potentially unstable patient in a remote location. In blunt chest trauma an important initial imaging modality is multidetector CT, as it will image the entire thorax in a short period of time and its ability to elucidate myocardial injury is approaching that of MRI³. Overall, after appropriate screening test, echo shortens time to and guides surgical intervention, guides pharmacologic therapy, and can help differentiate cardiac trauma from myocardial ischemia.

References:

1. Tanabe T, Hashimoto M, et al. Statistical analysis of deaths due to cardiovascular injuries. *KyuKyuigaku* 1984; 8:361-7.
2. Brathwaite CEM, Rodriguez A, et al. Blunt Cardiac Trauma: A 5-Year Experience. *Ann. Surg.* December 1990: 701-704.
3. Clancy K, Velopulos C, et al. Screening for blunt cardiac injury: An Eastern Association for the Surgery of Trauma practice management guideline. *Journal of Trauma Acute Care Surgery.* 2012; Volume 73, Number 5, Supplement 4: S301-S306.
4. Chirillo F, Totis O, Cavarzerani A, et al. Usefulness of transthoracic and transoesophageal echocardiography in recognition and management of cardiovascular injuries after blunt chest trauma. *Heart.* 1996; 75: 301-306.

