

Transesophageal echocardiography (TEE) is another imaging modality used to evaluate and diagnose damage to the aorta. It can be performed quickly, at the bedside, and has a low complication rate. For this reason, it may be preferred in unstable patients. A skilled operator can detect associated injuries, although accuracy can be operator-dependent and so is not always the best option.

CT Angiography

Cat-scan Angel with Angiography

The diagnostic test of choice for blunt thoracic aortic injury. It is immediately available in most trauma centers, rapid, and cost effective. In addition, it is highly sensitive (86% to 100%) and specific (40% to 100%). CTA findings indicative of an aortic rupture include active extravasation of intravenous contrast dye from the aorta, pseudo-aneurysm formation, an intimal flap, luminal filling defects, periaortic hematoma formation, as well as aortic contour abnormalities.

Management

Fluid Resuscitation

IV Fluid

In patients with traumatic aortic disruption, fluid resuscitation is indicated to help prevent or reverse hemorrhagic shock.

Blood Pressure Control

BP-Cuff Control Station

Initial management (perioperative) requires aggressive blood pressure control, to reduce the risk rupture progression. In addition to directly reducing blood pressure, heart rate control is also required in order to decrease tension on the aortic wall. Targets are heart rate \leq 90 beats/minute and systolic blood pressure \leq 120 mm Hg; and patients should not perform a Valsalva maneuver. Intravenous beta blockers (labetalol or esmolol) are the mainstays of therapy. Vasodilators have also demonstrated effectiveness in decreasing shear forces on the aortic wall.

Surgery

Surgeon

If patients are not stable enough to undergo imaging studies and traumatic aortic rupture is suspected, immediate surgery is indicated. Treatment has traditionally been immediate operative (surgical) repair. Repair can be done using either an open or endovascular technique. Open surgical repair (OSR) poses a significant surgical risk, with high rates of morbidity and mortality. In contrast, endovascular stent placement, or endovascular repair (EVAR), is now the treatment of choice. In this procedure, grafts cover the damaged portion of the aorta and prevent further blood loss, with improved morbidity and mortality (as compared to OSR). Surgical repair can be delayed, while evaluating and treating other potentially life-threatening injuries, in certain patients and while controlling blood pressure.

Considerations

Grave Prognosis

Gravestone

80% of patients with traumatic aortic rupture die before reaching a trauma center for treatment. For those individuals who survive the initial injury and reach an emergency department, 30% succumb to their injury within the first 24 hours.