Commentary

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Endovascular Techniques are the Treatment Modality of Choice

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Description

Arteriovenous (AV) fistulae of the renal artery presents with a variety of hemodynamic changes. Penetrating injury to the abdomen is the most common cause of this condition. However, AV fistula involving the renal artery to inferior vena cava (IVC) is a rare condition. Early and prompt intervention in the treatment of this condition is the most important factor in preventing complications that arises from AV fistula involving the renal artery to inferior vena cava.

Severe Respiratory Distress

A 36 year old male presented to our emergency department with 6 hours history of gunshot injury to the left side of chest wall and left upper thigh. The patient was initially taken to a nearby hospital where he was evaluated and found that he has high cardiac output heart failure, hemopericardium and hemothorax, he was resuscitated and Implantable Cardioverter Defibrillator (ICD) was placed before he was subsequently referred to our facility for further evaluation and management. On admission, he was examined and found to be in severe respiratory distress, tachypneic and tachycardic. Some investigation where done which include Contrast-Enhanced Computed Tomography (CECT) of chest, CECT of the abdomen and 2 D echocardiography. Investigations revealed fistula communicating between the right renal artery and inferior vena Cava, high cardiac output of 8.5 litres per minute, hemothorax, and hemopericardium. The patient was initially managed conservatively at the intensive care unit and subsequently worked up for right renal artery to IVC fistula angioplasty and stenting. The patient was taken for percutaneous transluminal angioplasty and stenting to the right renal artery. A pre-procedure angiography showed a fistula of right renal artery to inferior vena cava and poor perfusion of the right kidney. The wire (0.035 x 260 cm Terumo wire, Europe) was passed into the right renal artery and 3 Abbott vascular graft master covered stents (4.50 mm x 26 mm, 4.50 mm x 19 mm and 4.00 mm x 19 mm, USA) were placed to the right renal artery. The graft was post dilated with Viatrac 14 plus 5.0 mm X 20 mm x 135 cm and Indigo 6.0 mm X 20 mm x 130 cm non complaiant balloons, India. The post procedure angiography was good and also there was good perfusion to the right kidney.

The patient improved after the procedure and their tachycardia and tachypnoiec returned to normal. A post-procedure echocardiogram showed a cardiac output of 4 liters per minute. Patient was discharged well on dual antiplatelet therapy. AV fistula between the right renal artery and IVC is usually follows a penetrating injury and is rare. An AV fistula is an abnormal communication between an artery and a vein which does not pass through the capillary network. AV fistula can be congenital or acquired, may be single, multiple or associated with other vascular malformations. All types of AV fistula can cause local, regional and systemic effects depending on the size, location and duration of the fistula. The complications also vary depending on the degree and duration of the fistula. Once an AV fistula is diagnosed, an arteriovenous fistula complicating an anastomotic false aneurysm must be treated to prevent its growth, rupture, and cardiac decompensating Endovascular techniques are the treatment modality of choice because they reduce the risk of bleeding, the need for blood transfusion, the operative time, and risk of infection. The endovascular management of AV fistulae is promising; it reduces the risk associated with surgery, the long hospital stay following open surgery and complications such as bleeding and infection. There have been multiple studies recently that highlight the effects of diabetes mellitus (DM) on the outcomes of vascular interventions. Some of these variables include perioperative morbidity, long-term cardiovascular events, extended hospital stay, patient costs, readmission, and re-intervention rates. All of these variables are significantly increased in patients with diabetes compared to those without. Additionally, macro vascular complications are detected earlier in diabetic patients versus non-diabetic patients. However, the effects of hyperglycemia as a specific risk factor are for the most part left in the shadow of diabetes.

Diabetes Diagnosis

The effects of hyperglycemia can be overlooked or underestimated. However, hyperglycemia should be considered major contributor to sub-optimal surgical care. Hyperglycemia has been shown to have a large impact on a patient's postoperative course. For instance, impaired glucose metabolism and/or high blood glucose levels can down regulate the immune system, interfere with inflammatory responses, and trigger insulin resistance, and cause microvascular and

endothelial dysfunction. These effects can lead to postoperative complications resulting in readmission and/or re-intervention. Therefore, it may be crucial to better understand the impact of the dynamic relationship between hyperglycemia categorization and a possible diabetes diagnosis, as a representation for a state of “end-stage hyperglycemia” in patients undergoing surgical intervention. The effects of hyperglycemia can be overlooked or underestimated. However, hyperglycemia should be considered major contributor to sub-optimal surgical care. Hyperglycemia has been shown to have a large impact on a patient’s postoperative course. For instance, impaired glucose metabolism and/or high blood glucose levels can down regulate the immune system, interfere with inflammatory responses, and trigger insulin resistance, and cause microvascular and endothelial dysfunction. These effects can lead to postoperative complications resulting in readmission and/or re-intervention. Therefore, it may be crucial to better understand the impact of the dynamic relationship between hyperglycemia categorization and a possible diabetes diagnosis, as a representation for a state of “end-stage hyperglycemia” in patients undergoing surgical intervention.