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Case Report Open Access

Endovascular Treatment of a Symptomatic Mural Thrombus of the Descending Thoracic Aorta: A Case Report

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Abstract

Aortic mural thrombus is an uncommon source of peripheral embolization. We present a case of a patient with a symptomatic mobile mural thrombus in the proximal descending thoracic aorta who presented with left hand ischemia. The patient was treated with anticoagulation and radial artery thrombectomy followed by thoracic aortic stent graft placement.

Keywords: Mural thrombus; Thoracic aorta; Embolization

Introduction

A mural thrombus in a normal appearing thoracic aorta is an uncommon finding. The condition is typically diagnosed after an ischemic event. Currently there is no consensus on treatment of this condition. Though large majority of the patients are treated with anticoagulation alone, open aortic thrombectomy or replacement of involved portion of the aorta is the alternative surgical treatment for this condition [1]. There has been increasing reports of thoracic stent graft placement for exclusion of the thrombus in the recent years.

Case Report

A 52-year-old man was transferred to our facility after he presented to the outside hospital with worsening left hand pain and bluish discoloration of thumb for last 10 days. Upon further questioning he endorsed having episodes of bilateral flank pain and an episode of painful blue toes within last two years. Both of these episodes had resolved spontaneously and he did not receive any major workup at the time. Past history was significant for hypertension, GERD, neck surgery and 1 ppd smoking for over 20 years. On examination, left thumb was cyanotic and painful. Left radial artery pulse was non-palpable, however rest of the extremity pulses were all palpable. Duplex examination of left arm revealed occlusion of mid and distal radial artery. The clinical symptom was concerning for embolic event. Embolic workup was pursued with a transthoracic echocardiogram and CT angiogram of chest, abdomen and pelvis [2]. CT angiogram revealed thrombus involving the proximal descending thoracic aorta with a component that was free floating with narrow stalk (Figure 1). CT also demonstrated multiple infarcts on both kidneys and spleen concerning for recent embolization (Figure 2). The aorta was non aneurysmal and there was no significant plaque within the aortic wall. Echocardiogram did not show vegetation or patent foramen ovale. The patient was immediately started on therapeutic heparin anticoagulation. He was subsequently taken to the operating room for open radial artery thrombectomy with successful revascularization. With the concern for recurrent embolization, decision was made to treat the mural thrombus with endovascular exclusion with aortic endograft. The procedure was performed under general anesthesia. Intraoperative Trans-Esophageal Echocardiogram (TEE) demonstrated hyper mobile thrombus within the proximal thoracic aorta next to the subclavian artery origin (Figure 3). Percutaneous access was obtained on both femoral arteries. Over the Lundquist wire (Cook Medical, Bloomington, IN), 30 x 109 mm Zenith alpha thoracic endograft (Cook Medical, Bloomington, IN) was deployed right past the origin of left subclavian artery covering aortic segment containing the thrombus. All the wire and device manipulation was performed under continuous TEE imaging to prevent intraoperative embolization. Post stent TEE and angiography demonstrated successful exclusion of the thrombus with uninterrupted flow into the left sub-clavian artery. In the postoperative period, patient was maintained on anticoagulation with oral warfarin. Postoperative CT scan demonstrated complete coverage of the thrombus bearing

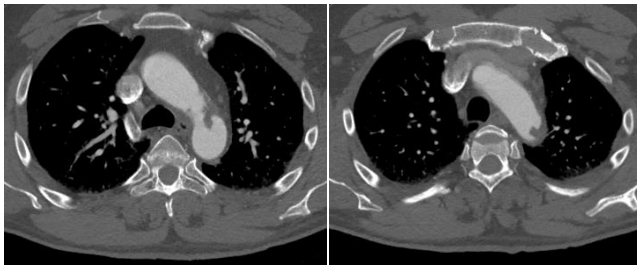

Figure 1: CT angiogram of chest demonstrating pedunculated thrombus involving thoracic aorta.

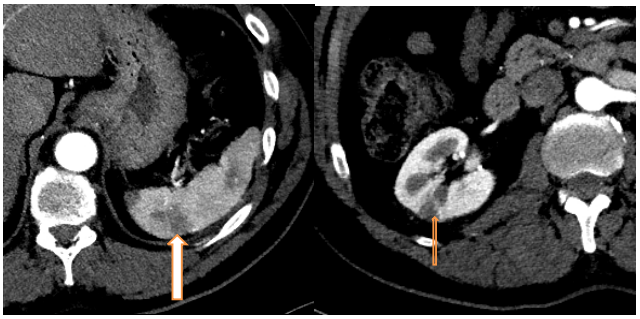

Figure 2: CT angiogram of the abdomen/pelvis demonstrating splenic infarct (large arrow) and renal infarct (small arrow).

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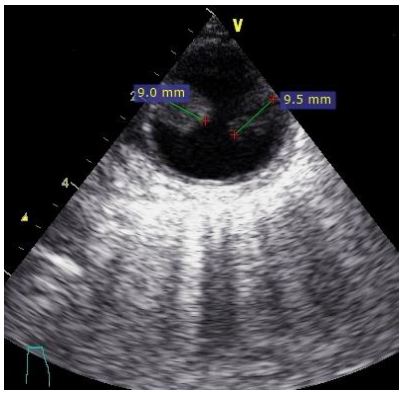

Figure 3: Intraoperative TEE demonstrates two distinct thrombi occupying majority of the aortic lumen.

segment of the aorta with patent graft. Patient continued to have a palpable radial pulse at the time of discharge. Hypercoagulability study that was performed postoperatively returned positive for heterozygous factor V Leiden mutation.

Discussion

Aortic mural thrombus in otherwise healthy aorta is a rare clinical condition and an uncommon cause of peripheral arterial embolization [1]. Over the past several years there has been increased recognition of this condition which is likely due to increase utilization of imaging modalities, such as, computed tomography angiography and TEE [2]. This rare condition may present with significant morbidity and mortality, with limb amputation, being the major morbidity. Upon reviewing 200 patients published in the literature, Fayad et al. [3] found that the most common presenting symptoms was limb ischemia (84%) followed by visceral ischemia (27%). Thirty five percentages of patients had a history of smoking and 25% of patients were found to have a hypercoagulable state. The results of that study also found the descending aorta and aortic arch to be the most common locations for the mural thrombus. They reported recurrence rate of 25.7% for another distal embolic event while on anticoagulation treatment. Tsilimparis et al. [4] reported a case series of 4 patients who underwent surgical management with either thrombectomy or endovascular stent. Post-operative course of these patient were uneventful and there was no recurrent thrombotic events during the 2 year follow up.

Myerman [5] recently published about 74 cases reported in the literature in last 15 years. Though the patients were equally likely to receive medical, open surgical or endovascular therapy as the initial treatment modality, they noted that there was an increasing trend of endovascular treatment in last 5 years. Of the 29 patients that underwent aortic stent graft, 27 (93.1%) had complete exclusion of thrombus with no recurrence or embolic events at follow up.

Our patient had at least two prior episodes of embolic events as evidenced by flank pain concerning for renal infarct and a painful big toe concerning for embolism to lower extremity. The CT scan finding was particularly concerning because he had at least two large thrombi with a narrow stalk protruding into the aortic lumen which had potential for embolization at any moment. The patient was relatively young with a significant history of long-standing smoking. Rest of the aorta did not have any significant plaque within it. The patient appears to have embolized the thrombus that was present either at the origin of the subclavian artery or proximal to it. That explains why there was no thrombus in the arch or ascending aorta, however he had large thrombus burden in the descending aorta. No significant history of cardiac disease and no evidence of cardiac vegetation or structural heart disease in echocardiogram suggest that heart is not the likely source of this embolic episode. Based on history of recurrent embolic events and presence of mobile pedunculated thrombus, we feared that this patient would continue to have recurrent embolization. We felt that anticoagulation alone would not be enough to prevent future embolic episodes. Though open surgical thrombectomy or replacement of the aorta with the graft has been described in the literature for this condition, recent evidence suggests that comparable result could be obtained by endovascular exclusion of the aorta containing the thrombus. Though there has been no study demonstrating superiority of endograft over the open surgery, the fact that endovascular surgery can be performed with less invasive means and with limited postoperative morbidity, endovascular intervention remains an attractive option over open surgical treatment.

Conclusion

Endovascular aortic stenting should be considered as a valuable treatment modality in addition to anticoagulation for selected patients with aortic mural thrombus especially if there is an evidence of or concern for recurrent embolization.

Disclosure Statement

All authors have no conflict of interest.

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