

## CASE REPORT

# Rare Cause of Lower Limb Deep Venous Thrombosis: A Case Report

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### SUMMARY

**Deep venous thrombosis (DVT) in lower limbs caused by abdominal aortic aneurysm (AAA) is rare. A combination of anatomical obstruction with surrounding inflammatory tissue and reduced blood flow in venous limb were probably the main reasons for the occurrence of the DVT. We report a case of infra-renal AAA presented as lower limb DVT and symptomatic pulmonary embolism.**

**KEY WORDS:** *Deep venous thrombosis, abdominal aortic aneurysm, vena caval compression*

### INTRODUCTION

The incidence of lower limb deep venous thrombosis (DVT) in general population was reported to be 5 per 10000 per annum<sup>1</sup>. However, lower limb DVT caused by abdominal aortic aneurysm (AAA) is a rare occurrence. We report a case of infra-renal AAA, which presented as lower limb swelling and shortness of breath to our hospital, with highlights on the possible pathophysiology of the presentation and to discuss the strategies of management in this case.

### CASE REPORT

A 78-year-old man presented to our hospital with recent progressive onset of left lower limb swelling and pain. This was followed by shortness of breath a few days later. There was no prior history of DVT, immobilization or malignancy. He was a heavy smoker with medical history of hypertension and diabetes mellitus on treatment. On examination, he was haemodynamically stable. Chest examination showed dullness and reduced air entry on the right upper lung. Abdominal examination revealed a pulsatile epigastrium mass measuring 6cm wide. Lower limb examinations found to have a pitting left lower limb edema. Lower limb pulses were all normal. Blood investigations showed no obvious blood clotting disorder. Duplex ultrasound was performed and confirmed left lower limb DVT extending to the left external iliac vein. Computed tomography of the thorax and abdomen showed presence of pulmonary embolism at both pulmonary arteries, a 6cm size infra-renal AAA with aneurysmal dilatation of both common iliac arteries (CIA) and left external iliac vein thrombosis. He was started on anticoagulation therapy with low molecular weight heparin (LMWH). Prior to the surgery, an inferior vena cava (IVC) filter was inserted to prevent further pulmonary embolisation.

A few days later, he underwent elective open aneurysmectomy with inlay graft. Intra-operatively the extent of the aortic

aneurysm was from infra-renal position to both CIA. There was dense fibrous adhesion surrounding the heavily calcified lower aorta and right CIA. The left common iliac vein (CIV) was compressed from the aortic aneurysm and the surrounding inflammatory tissues. Venous thrombosis were found from the left CIV and extended to the left external iliac vein. A bifurcated Dacron graft was used, proximally anastomosed with infra-renal aorta, while the distal anastomosis was performed with the right external iliac artery and left CIA. The right internal iliac artery was ligated to prevent backflow of blood into the aneurysmal sac.

Post-operatively he was nursed in intensive care unit (ICU). Anticoagulation with LMWH was continued post operatively. However, due to prolonged mechanical ventilation in the ICU, he developed ventilator-associated pneumonia and septicemia. Despite aggressive intravenous antibiotics treatment and ICU supportive care, he succumbed to septicemia 3 weeks after the successful open AAA repair.

### DISCUSSION

There are only a few case reports documenting AAA as a cause of lower limb DVT<sup>2</sup>. In normal anatomy, the left CIV traverses across posteriorly to the right CIA. An increase in the arterial vessel diameter would potentially compressed onto the adjacent CIV, particularly from the left lower limb<sup>2</sup>. Despite the close proximity of the iliac vein and artery to each other, aneurysm of the aorta that compresses the adjacent iliac veins has rarely been reported. However, there were several reports of vena caval obstruction as a result of inflammatory aortic aneurysm<sup>3</sup>. There was dense adhesion tissue as a result of the aneurysmal aorta found in our patient. Such adhesive tissue reduced the caliber of the iliac veins and thus mechanically reducing the venous blood flow, further fulfilling the condition in Virchow's triad as cause of DVT<sup>4</sup>. Furthermore, the vessels were atherosclerotic and contained calcified hard plaques causing external compression to adjacent iliac veins. The combination of mechanical compression and reduced blood flow were likely to be the main cause of his DVT.

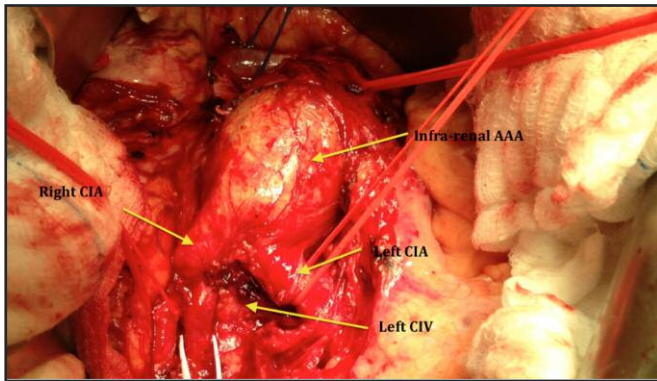
After stabilizing his initial condition, our management was to investigate him for possible hypercoagulable state, and it was found to be negative. The risk of pulmonary embolism must be limited during surgical intervention and manipulation. Whether or not pulmonary embolism has occurred, IVC filter insertion is recommended to prevent any initial or subsequent pulmonary embolism<sup>5</sup>.

Although our patient was asymptomatic of his AAA, we have elected to perform the open repair of AAA for him because of

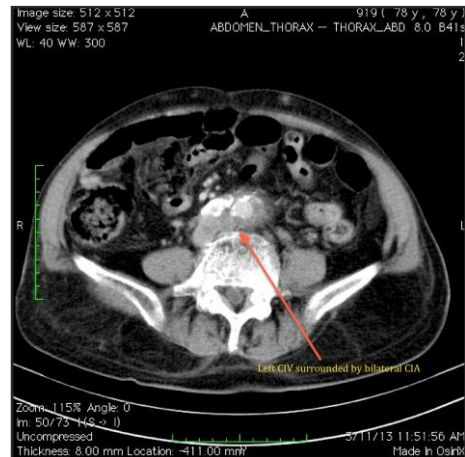
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**Fig. 1:** Intra-operative findings of infra-renal AAA with dilated both CIA compressing on the left CIV posteriorly.



**Fig. 2:** CT Scan showing cross sectional view of left CIV compressed by the CIA and its surrounding inflammation.

the complication from the AAA obstruction onto the iliac vein. As a result of the obstructed venous return from the DVT in the lower limb, extensive retroperitoneal venous collaterals have formed around the pelvis and together with the inflammatory tissue from around the aneurysm, dissection and mobilization of the aneurysmal sac was difficult. Bifurcated graft was used where the right limb of the graft was anastomosed to right EIA and the left limb of the graft to left CIA. This is to avoid anastomosing the inflamed and densely adhered tissue seen in the distal aorta.

Endovascular aneurysmal repair (EVAR) has shown to be of advantage compared to open repair in recent years<sup>6,7</sup>. EVAR would be the treatment of choice for this patient in our centre due his advancing age and medical comorbid profile. However, the role of EVAR in the presence of DVT as a result of aneurysmal sac compression has not been reported. The main reason being the aneurysmal sac would not reduce in size immediately after the placement of the stent graft. The surrounding adhesion causing the reduced blood flow from the small venous caliber would still be present and would unlikely to be decompressed, rendering EVAR ineffective in releasing the obstruction.

**CONCLUSION**

Most DVT were found after AAA surgery. Lower limb DVT caused by the compression of AAA is very rare. Routine screening of lower limb DVT for AAA cases would be an option for early detection. Management strategies would include placement of IVC filter with pharmacological anticoagulation. This would be followed by open repair of the AAA as EVAR has not been established in such cases.

**REFERENCES**

1. Fowkes FJ, Price JF, Fowkes FG. Incidence of diagnosed deep vein thrombosis in the general population: systemic review. *Eur J Vasc Endovasc Surg.* 2003 Jan; 25(1): 1-5.
2. Combe J, Besancenot J, Milleret P, Camelot G. Iliocaval venous compression due to aneurysm of the abdominal aorta: report of ten cases. *Ann of Vas Surg.* 1990 Jan;4(1): 20-5.
3. Braxton JH, Salander JM, Salander JM, Gomez ER, Conaway CW. Inflammatory abdominal aortic aneurysm masquerading as occlusion of the inferior vena cava. *J Vasc Surg.* 1990 Nov; 12(5): 527-30.
4. Walsh JJ, Williams LR. Vein compression by arterial aneurysms. *J Vasc Surg.* 1988 Oct; 8(4): 465-9.
5. Brandão D, Simões JC. Occlusion of inferior vena cava: a singular presentation of abdominal aortic aneurysm. *Case Rep Med.* 2009 Dec: 827954.
6. Harunarashid H, Jasman WJ, Azim MM, Das S. Descending thoracic mycotic aneurysm: successful treatment with endovascular stenting. *Clin Ter.* 2012 Jul; 163(4): 311-2.
7. Pratesi C, Piffaretti G, Pratesi G. ITER Registry and results of Gore Excluder endograft for the treatment of elective infrarenal abdominal aortic aneurysms. *J Vasc Surg.* 2014 Jan; 59(1): 52-57.e1.