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Left Lower Limb Proximal Deep Vein Thrombosis With Bilateral Pulmonary Embolisms Secondary to an Abdominal Aortic Aneurysm Causing Inferior Vena Cava Obstruction Along with a Co-Existing May-Thurner Variant

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Summary

We are presenting a case of a venous thrombosis (VTE) caused by two very rare & more importantly surgically correctible co-existing factors. A proximal left lower limb deep vein thrombosis (DVT) and pulmonary embolisms (PE)s with lung infarcts - secondary to an abdominal aortic aneurysm (AAA) causing inferior vena cava (IVC) compression and venous stasis with a coexisting May - Thurner variant too, in case things weren't interesting enough. Beware of the occasional Zebras (they do exist) when you are surrounded by horses. The patient underwent a successful open repair of both with a satisfactory outcome.

Background: Venous thrombo-embolism (VTE) is a common and significant cause of morbidity and mortality in our current day to-day clinical practice and the need to further investigate unprovoked VTEs still remains very controversial despite many cohorts, reviews and meta analysis publications. Seek and thou shall find the unexpected sometimes - and looking further in unprovoked VTEs may lead on to not only diagnosing the underlying occult malignancies, but also reversible surgical pathologies as in this case.

Case Presentation

A 57 years old gentleman was referred to our Deep Vein Thrombosis (DVT) clinic with the history of left lower limb pain and swelling of one week duration, having already been started on Rivaroxaban by his General Practitioner. His past medical history was unremarkable, apart from a 100 pack-years smoking history. There were no obvious precipitating factors for a venous thromboembolism (VTE) nor red flags of an underlying malignancy. He was referred to our Ambulatory Emergency Care Unit (AECU) as he has also started complaining of dyspnoea at that point in time. Physical examination was unremarkable apart from the swollen left leg.

Investigations and Differential Diagnosis IF Relevant

A Doppler ultrasound of the left lower limb confirmed thrombus in all major deep veins of the left leg, extending to the left external iliac vein. An electrocardiogram(ECG) showed inverted T waves in anterior leads V1 to V3 (Figure 1), which was attributed to a right heart strain secondary to a possible pulmonary embolism (PE) in this clinical context. A chest X-ray was done which showed a Hampton's hump (Figure 2), suggesting an underlying pulmonary infarction [1,2]. A computed tomography of pulmonary angiogram (CTPA) along with the computed tomography (CT) of the chest, abdomen and pelvis confirmed large bilateral pulmonary emboli (Figure 3) with suggestion of Right heart strain along with foci of consolidation in the upper lobe of the left lung likely secondary to haemorrhage or infarction (Figure 4). Although CT of abdomen and pelvis did not reveal any occult malignancy for which it was originally requested,

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Figure 1: Electrocardiogram suggesting possible right ventricle strain.

Figure 2: Chest radiography showing Hampton's hump - Upper lobe of left lung.

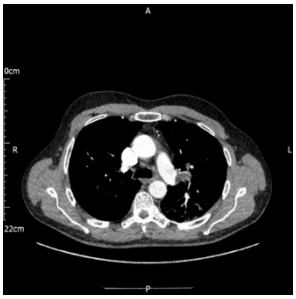

Figure 3: Transverse CT pulmonary angiogram showing a large embolus in segmental branch of left pulmonary artery.

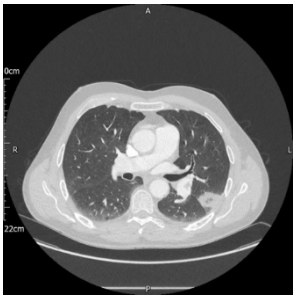

Figure 4: Transverse CT Chest showing peripheral pulmonary infarct in the left upper lobe abutting the oblique fissure.

Figure 5: Transverse CT Abdomen showing abdominal aortic aneurysm with displacement and compression of inferior vena cava lumen.

surprisingly it did show an incidental 7cm abdominal aortic aneurysm (AAA) which was compressing and displacing the inferior vena cava (IVC), causing venous stasis (Figures 5 and 6), and a left common iliac artery compressing the left iliac vein separately (Figure 7), as picked up by the vascular team.

Figure 6: Coronal CT abdomen showing abdominal aortic aneurysm causing mass effect on the inferior vena cava and deep vein thrombosis in left common femoral vein.

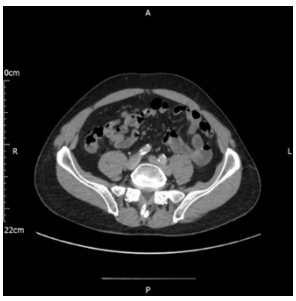

Figure 7: Transverse CT Abdomen-Pelvis showing compression of left common iliac vein by the left common iliac artery.

Treatment if relevant

Patient was promptly referred to vascular surgeons team and the risk of anticoagulation in the context of aortic aneurysm was explained. When the vascular team reviewed the patient and the CT images, they were also concerned about an element of May-Thurner syndrome variant, specifically left common iliac artery compressing on the left common iliac vein, along with the AAA compressing the IVC possibly causing venous stasis at both sites.

Outcome and Follow-Up

He was treated with anticoagulation and he later underwent an open repair of the aortic aneurysm successfully. He made a complete recovery.

Discussion Include a very brief review of similar published cases

Venous thromboses are historically due to the Virchow's triad of stasis, hyper-coagulability and lumen injury. Unruptured abdominal aortic aneurysm compressing and displacing the IVC causing venous stasis has been well described in literature [3,4,5]. May-Thurner syndrome, which is a rarely diagnosed condition in which patients develop iliofemoral deep venous thrombosis (DVT) due to an anatomical variant in which the right common iliac artery overlies and compresses the left common iliac vein

against the lumbar spine, has also been well described as a cause of deep vein thrombosis in left lower limb [6,7]. in this specific case, what we have is a variant – left common Iliac artery causing compression and resultant venous stasis, of the left common iliac vein, contributing additionally (and separately) to the left lower limb DVT. The management of abdominal aortic aneurysm usually varies between an Endovascular repair (EVAR) versus an open repair,[8,9], while the surgical options in May- Thurner syndrome may include Endo-vascular stenting plus or minus thrombectomy or bypass grafting or arterial repositioning in certain instances [7,10]. Having both pathologies contributing to DVT and PE at the same time, in the same patient is exceptionally rare. This rare combination often necessitates an open repair rather than endovascular approach and EVAR is often reserved only for those who are frail with co-morbidities, in whom an open approach isn't feasible [11]. The detection and treatment of venous thromboses and underlying pathologies have tremendously improved over the years. This case highlights and demonstrates the need of imaging in excluding underlying malignancies, as well as ruling out surgical causes / structural anomalies, especially with the current NICE guidelines moving further and further away from imaging in unprovoked VTEs [12]. The potential benefit of extensive screening over limited screening to no screening at all if they have no red flags of an underlying neoplasm have been heavily debated over the past two decades, with the occurrence of underlying occult malignancies generally being thought to being anywhere between 4 to 9 % according to current studies [13].

Learning Points/Take Home Messages 3-5 bullet points

- The relevance of ruling out reversible surgical causes / anatomical anomalies in unprovoked VTEs.
- The role of imaging in unprovoked VTEs – further need to reassess this controversial topic.
- The importance of having an open approach - to analyse and investigate each case on its own merit, often above and beyond the restraints of formulaic guidelines - often if you venture to explore further in unexplained scenarios, you shall find the rare and unexpected, yet potentially reversible causes, as in this instance.

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