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Case Report & Review of The Literature

Acute Limb Ischaemia Following Elective Left Upper Lobectomy for Early NSCLC: A Rare but Serious Complication Arising from the Pulmonary Vein Stump**James Elliott^{1*} and Anand Iyer²**¹Princess Alexandra Hospital, Brisbane, Queensland, Australia²Cardiothoracic Surgeon, Princess Alexandra Hospital, Brisbane, Queensland, Australia

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ABSTRACT

Patients undergoing Left Upper Lobectomy (LUL) appear to be at risk of a unique post-operative complication that is not well-documented: Pulmonary Vein (PV) stump thrombosis +/- systemic arterial embolisation [1-3]. We describe the details of a rare case from our institution, present a review of this subject from the limited literature available, and suggest potential strategies to anticipate, detect and manage this entity.

A 70 year old female patient underwent left upper lobectomy and mediastinal lymph node sampling via repeat left thoracotomy. The procedure was unremarkable apart from some adhesions. She progressed well post-operatively on the ward. On post-operative day 2 the patient developed sudden-onset left leg pain and paraesthesia and CT-Angiography confirmed the diagnosis of left common femoral artery embolus and left superior PV stump thrombosis. The patient returned to theatre for femoral embolectomy, continued systemic anticoagulation, and made an excellent recovery thereafter.

The aetiology of this complication has been documented in some case reports, but it is not explored further in trials or thoracic surgery texts [2-3]. One cohort study involving CT-angiography after lobectomy surgeries found that left upper lobectomy was unique as a risk factor for PV stump thrombosis¹. It may be related to the relatively longer LSPV stump and stasis of blood in the stump [4].

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Patients undergoing Left Upper Lobectomy (LUL) appear to be at risk of a unique post-operative complication that is not well-documented: Pulmonary Vein (PV) stump thrombosis +/- systemic arterial embolisation [1-3]. We describe the details of a rare case from our institution, present a review of this subject from the limited literature available, and suggest potential strategies to anticipate, detect and manage this entity. A 70 year old female patient presented with an FDG-avid lesion in her left upper lobe, on a background history of multifocal lung adenocarcinoma with previous wedge resections of adenocarcinomas in her right upper lobe and right lower lobe, and a wedge resection of her left upper lobe that was negative for malignancy 2 years earlier.

She underwent left upper lobectomy and mediastinal lymph node sampling via repeat left thoracotomy. The procedure was unremarkable apart from some adhesions. She progressed well post-operatively on the ward. On post-operative day 2 the patient developed sudden-onset left leg pain and paraesthesia and CT-Angiography confirmed the diagnosis of left common femoral artery embolus and left superior PV (LSPV) stump thrombosis. The patient returned to theatre for femoral embolectomy, continued systemic anticoagulation, and made an excellent recovery thereafter. The patient was recommended for 6 months of therapeutic anticoagulation and has had no further cardioembolic events now over 8 months since the lobectomy surgery in question.

The aetiology of this complication has been documented in some case

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reports, but it is not explored further in trials or thoracic surgery texts [2, 3]. One cohort study involving CT-angiography after lobectomy surgeries found that left upper lobectomy was unique as a risk factor for PV stump thrombosis¹. It may be related to the relatively longer LSPV stump and stasis of blood in the stump⁴. It has been reported that thrombosis develops in longer PA stumps [4]. This same study postulates that perhaps in short PV stumps, blood flow may be satisfactory because blood flow spreads from the left atrium through the entire PV stump. In the long PV stumps, blood flow in the left atrium may not spread throughout the PV stump. Another study compares the lengths of four PV stumps after lobectomy using three-dimensional CT images [5]. In this study, the LSPV stump remained significantly longer than the other 3 PV stumps. In addition to this, the intrapericardial LSPV may be anatomically longer than the other 3 PVs.

One possible management strategy includes post-operative CT-Angiography to exclude PV stump thrombosis and/or prescribing prophylactic anticoagulation therapy for a limited course post-operatively. However, this has not been formally tested, and carries with it the specific risks of post-operative bleeding, as well as the hazards of using iodinated contrast in the post-operative period. A high index of clinical suspicion for cardioembolic events is recommended for all patients recovering from left upper lobectomy.

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