Case Report

Acute limb ischaemia in a young male with secondary polycythemia: A case report

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ABSTRACT

Acute limb ischemia is a life and limb-threatening pathology rarely observed in young populations. One of the uncommon causes includes hypercoagulable state which can occur in secondary polycythemia leading to an abnormal increase in the erythrocyte mass. We present a rare case of Rutherford type 2A acute limb ischemia in a 36-year-old male patient with a background of secondary polycythemia who presented with severe pain and neurological deficits in his left lower limb. Acute limb ischemia is a surgical emergency that is important for clinicians to have a low threshold of suspicion of this life and limb-threatening condition due to the diverse and potentially atypical causes.

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Introduction

Secondary polycythemia is an abnormal increase in the erythrocyte mass caused by an elevated level of erythropoietin or other transcription factors, usually as a response to chronic hypoxemia such as chronic pulmonary obstructive disease (COPD) [1]. It leads to a hypercoagulable state due to the high blood viscosity. Most complications occur in the deep venous system [2]. However, rare complications can include acute limb ischemia (ALI) due to its thromboembolic risk. We report a rare case of Rutherford type 2A ALI with secondary polycythemia in a young male patient.

Case report

A 37-year-old male attended a district general hospital as a stroke call with a 4-hour history of moderate left leg weakness with sensory deficit below the knee following a sudden onset of pain in the leg. His medical history included polycythemia secondary to COPD and hypertension. He is a smoker with 40-pack-year. His vital signs were normal on admission. Left lower limb power was found to be 2/5 on the MRC scale with sensory inattention and insensate below the knee. Pulse on the left lower limb was reduced. There was no other focal neurology noted.

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Initial hematology results revealed an elevated hemoglobin of 180 g/L and a hematocrit of 54%. Computerized tomography (CT) head and angiogram of lower limbs were performed. CT head did not show any evidence of acute intracranial pathology. Occlusion of the left common femoral artery and the left popliteal artery with a long thrombus within the left superficial femoral artery were shown on the CT Angiogram (Figs. 1-5). He was managed with emergency thrombectomy with fasciotomy and made an uneventful recovery.

**Discussion**

Acute limb ischemia caused by progressive arterial disease or embolism commonly occurs in the elderly population with various comorbidities [1]. However, investigation of the etiology along with urgent revascularization is priority in the young demographic, especially for the rare causes such as this case. The choice of revascularization techniques depends on the presence of neurological deficit, type of blood vessel, extent of pathology, comorbidity, duration of ischemia, and intervention-related risks and benefits [2].

Prevalence of secondary polycythemia in COPD patients ranges from 6% to 10.2% [3]. It is defined as an abnormal hemoglobin value greater than 170 g/L in males and greater than 150 g/L in females [4]. An elevated erythropoietin (EPO) level leads to secondary polycythemia as a response to chronic hypoxemia. COPD is one of the commonest causes for chronic hypoxemia, followed by obstructive sleep apnea (OSA) as well as muscular abnormalities such as obesity hypoventilation syndrome (OHS) [5].

Diagnosis of secondary polycythemia is made with a detailed clinical evaluation and laboratory parameters. A detailed history should focus on identifying the underlying cause such as COPD, OSA, and OHS as patients usually have non-specific symptoms. Scratch marks, cyanosis, tar staining, and clubbing may be common to see on physical examina-
Thrombosis is a common cause of mortality and morbidity in patients with polycythemia. In a multicity cohort study, the prognosis varied with different complications but the shortest life expectancy was 21.1 months from the time of diagnosis [5]. It may be clinically challenging to manage secondary polycythemia due to its rarity and diverse etiology. Multidisciplinary team approach should be adopted for the patients. Majority of the management have been extrapolated from managing primary polycythemia. Prevention of thromboembolic episodes may be helped by low-dose aspirin [7]. Moreover, hypoxia may be corrected with judicious use of low flow oxygen therapy for patients with COPD, to avoid oxygen toxicity and respiratory depression [8].

**Conclusion**

Hypercoagulability due to secondary polycythemia is rare etiology of ALI that can be overlooked. Other complications may include stroke, venous thromboembolism, and pulmonary hypertension due to its high thrombotic risks. ALI is a surgical emergency that is important for clinicians to have a low threshold of suspicion of this life and limb-threatening condition due to the diverse and potentially atypical causes. Specific management of secondary polycythemia should direct to its underlying cause and therapeutic goal.

**Patient consent**

I confirm that written, informed consent for publication of case was obtained from the patient.

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