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Hand Ischemia Due to Arterial Thromboembolism in a Patient with Crohn's Disease: A Case Report

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Abstract Patients with inflammatory bowel disease (IBD) are at an increased risk of thromboembolic events due to chronic inflammatory state which include venous thromboembolism and rarely arterial thromboembolism (ATE). ATE involves thrombosis of the cerebral, splanchnic, carotid, coronary, aorta, renal and upper and lower extremity arteries. We describe a case of a 50-year-old female patient with crohn's disease who developed ATE. She presented to the emergency department complaining of sudden pain in right hand with bluish discoloration of fingers associated with numbness over the C8 and T1 distribution. She was on mesalazine 3 g once daily for crohn's disease. Examination of other systems was normal and there was no focal neurological deficit. Laboratory investigations were within normal limits. CT upper extremity angiogram showed abrupt cutoff of distal part of ulnar artery proximal to the tip of ulnar styloid. CT of thoracic aorta showed filling defect of the right brachiocephalic artery causing mild to moderate stenosis. She was managed conservatively with heparin, aspirin initially and discharged home on apixaban with complete resolution of the thrombus. To the best of our knowledge this is the first case of thromboembolism in the hand originating from the right brachiocephalic artery and obstructing the distal ulnar artery in a patient with crohn's disease being reported and was successfully managed conservatively.

Key Words Aortic thrombosis, crohn's disease, hand ischemia, arterial thromboembolism

INTRODUCTION

Patients with inflammatory bowel disease (IBD) are at a significant risk of venous and arterial thromboembolic events [1-4]. The most common thromboembolic events in IBD are venous thromboembolism (VTE) and less frequently arterial thromboembolism (ATE) associated with worse outcome [1-4]. Very few cases of ATE in IBD are reported in literature. ATE may involve thrombosis and/or occlusion of the cerebral, splanchnic, carotid, coronary, aorta, renal and upper and lower extremity arteries [5,6]. Patients are managed by therapeutic anticoagulation and surgery. Infarction of the upper limb, leg, foot and toe may require amputation and death could result due to ischemia and sepsis [3,4]. It is noteworthy that arterial thromboembolic disease in IBD patients occurs in the absence of traditional cardiovascular risk factors, such as older age or arterial hypertension [6].

Case report

A 50 years old female presented to emergency department complaining of sudden pain in right hand with cyanosis of fingers. She was in her usual state of health until few hours prior to her arrival to emergency department in November 2023, when she started to have sudden right hand painful bluish discoloration mainly involving 5th, 4th and 2nd fingers. It was associated with numbness over the C8 and T1 distribution. At the same time, she gave history of bilateral eye floaters for almost 15 min, which was not associated with loss of vision, painful/painless red eye nor diplopia or blurry vision. There was no history of current joint pain, or joint swelling, no skin rashes, morning stiffness or oral ulcer and no prior trauma or exposure to cold temperature.

She was diagnosed with crohn's disease a month before this presentation. She was on mesalazine 3 gm once daily. She has positive history of early miscarriages, within the first trimester.

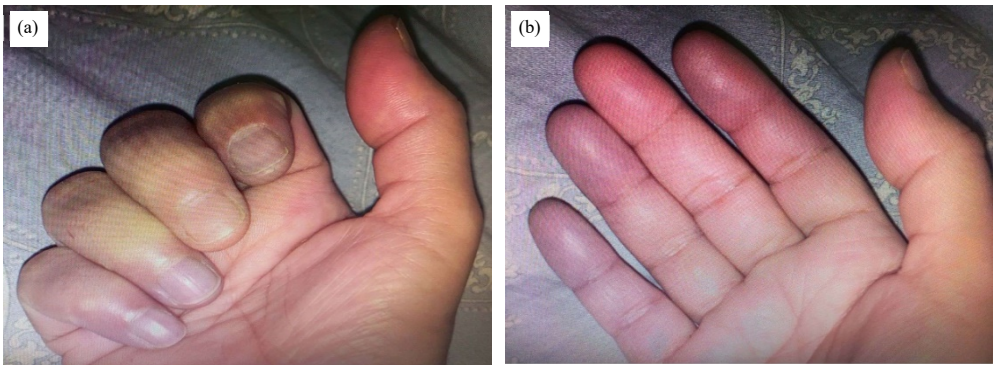

Figure 1(a-b): Bluish discoloration of 5th, 4th and 2nd distal phalanx in patient with crohn's disease

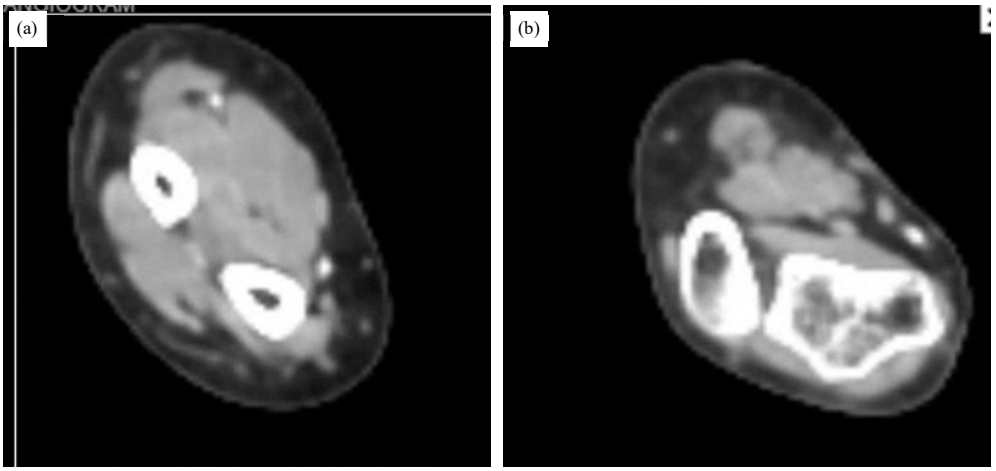

Figure 2(a-b): CT Upper extremity angiogram of patient with crohn's disease having bluish discoloration of fingers

Upper limbs exam showed right hand bluish discoloration of 5th , 4th and 2nd distal phalanx with tenderness and delayed cap refill, palpable brachial and radial pulse with absent ulnar pulse, cold upon palpation and no hand joint swelling and no muscle wasting (Figure 1).

Cardiovascular system, respiratory system, abdomen examinations were all normal. There was no focal neurological deficit. Laboratory investigations were within normal limits. WBC count was little high (WBC 12.5 $X10^9$/L), showing mild lymphocytosis with occasional reactive forms. No definite blast cells were seen. Hemoglobin was 11.8 gm/dL (12 gm /dL normal), RBC were normocytic normochromic with few ovalocytes and mild polychromasia. Less than 1% schistocytes were observed. Platelet number was mildly increased (491×10^9/L) (>450×10^9/L High) with occasional giant forms. ESR was 7, CRP was 2.34 mg/L and ANA was negative. Urea, creatinine were within normal limits. Chest X ray and echocardiogram were normal.

CT upper extremity angiogram at the time of presentation in November 2023 showed abrupt cutoff of distal part of ulnar artery at level about 4 cm proximal to the tip of ulnar styloid. The visualized axillary, brachial, radial and interosseous arteries were patent with no flow limiting stenosis or aneurysm (Figure 2). CT of thoracic aorta showed filling defect of the right brachiocephalic artery causing mild to moderate stenosis with no sign of vasculitis (Figure 3). She was managed conservatively with heparin infusion, warfarin and aspirin initially. She showed gradual improvement in color of her fingers with return to normality (Figure 4). She was discharged on mesalazine 3gm OD and ustekinumab for crohn's disease, apixaban 5 mg BID and aspirin 81 mg OD with gradual improvement. CT of thoracic aorta at follow up in March 2024 showed resolution of the previously seen right brachiocephalic artery filling defect. The patient was seen in September 2024, with return of normality to her hands.

DISCUSSION

The chronic inflammation observed in IBD patients initiates the coagulation cascade which leads to a higher risk of thromboembolic events [5]. Compared to general population, patients with IBD are at almost 3 folds higher risk of morbidity and mortality from thromboembolic complications

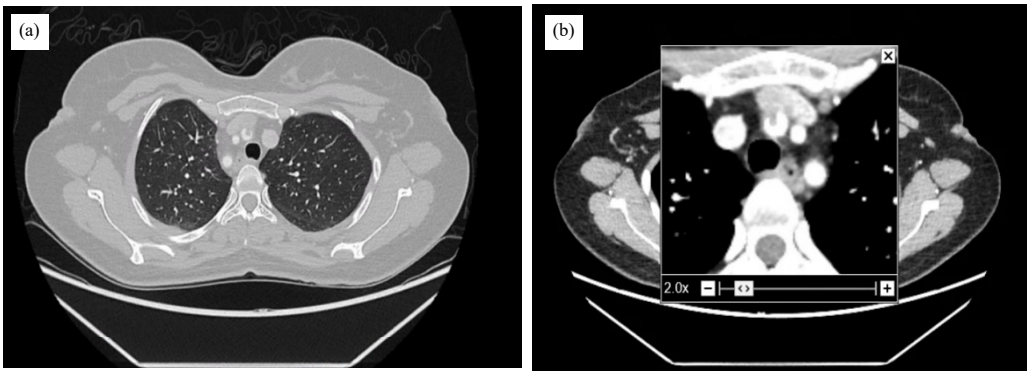

Figure 3(a-b): CT Thoracic aorta showed filling defect of the right brachiocephalic artery in patient with crohn's disease having bluish discoloration of fingers

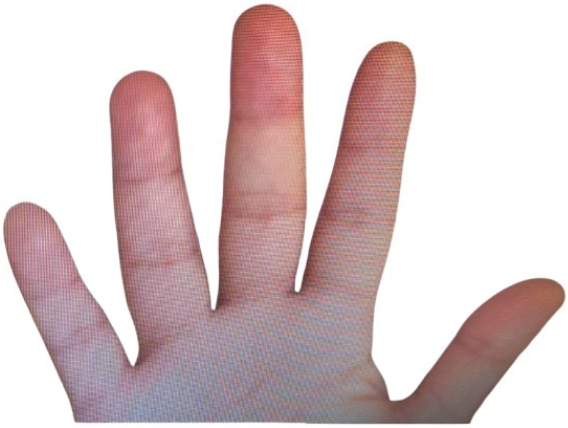

Figure 4: Fingers showing return to normality post treatment

[7]. There is a greater risk of developing postoperative VTE in IBD patients, hence thromboprophylaxis is performed from the day of surgery to discharge [8].

Arterial thromboembolism occurs rarely in IBD patients with crohn's disease with only few cases reported in the literature [2,4]. Novacek *et al.* [2]. in 2004 reported 2 of their cases with 10 previously reported ATE cases in IBD. Saad *et al.* [4] in 2022 reported a case with summary of 21 previously reported ATE cases in IBD. We present a case of ATE in crohn's disease who developed ischemia of hand fingers. ATE is reported to be associated with worse outcomes compared to VTE [2,3,9]. Pathophysiology of arterial thromboembolism in IBD patients has not been completely understood [2,3]. It has been proposed that it involves a complex multifactorial processes [2,3,9]. The relative risk of VTE is 16 times higher during inflammatory IBD flares in IBD patients than in controls [7]. It has been reported by some that that 80% of patients with IBD had active disease at the time of VTE while others have reported that IBD was in remission in 30% of patients and 77% patients developed VTE spontaneously [5,10]. The review of the few cases reported in literature has shown that AVT occurred in patients with active IBD disease more compared to quiescent state [2,4,11-16].

ATE leads to sequelae of damages in crohn's disease which may include small bowel infarction, colonic ischemia and severe ischemia of the upper and lower extremities [2,4,11-16,19]. ATE in crohn's disease was managed with thrombolectomy and heparin anticoagulation treatment as per previous reports [2,4,11-16]. The recommendation of Canadian Association of Gastroenterology guidelines for IBD-related venous thromboembolism includes therapeutic anticoagulation for at least three months post-IBD exacerbation [17]. The outcome of ATE in IBD as per the previous case reports was either complete resolution of the thrombus, amputation of extremities or death from multi-organ failure as a result of ischemia of bowel [2,4,6,11-16,19]. As per previous case reports, the outcome of management of ATE in crohn's disease patients for ischemia of extremities was good, however, some patients had leg, toe and upper extremity amputations [2,12,15,19]. Our patient was conservatively managed with heparin,

warfarin initially and maintained on aspirin with mesalazine and ustekinumab to control crohn's disease flare with good outcome of resolution of thrombus.

Herein we report a patient with crohn's disease who developed ischemia of hand, due to a thrombus in the distal part of ulnar artery at level about 4 cm proximal to the tip of ulnar styloid. which has not been reported earlier. There are two case reports published in 2007 and 2011, describing a case of ulcerative colitis complicated by ATE in brachiocephalic trunk who presented with ischemic discoloration and signs of mircroembolization in fingers of the right hand and the other one a patient with crohn's disease with thrombus in left subclavian and axillary arteries but not distally causing ischemia of left upper extremity which required its amputation [15,18]. Ours is the first case of presentation as ischemia of fingers of the hand in crohn's disease due to thromboembolim of the distal part of ulnar artery at level about 4 cm proximal to the tip of ulnar styloid and was successfully managed conservatively.

Conflict of interest

The authors declare no conflict of interests. All authors read and approved final version of the paper.

Authors contribution

All authors contributed equally in this paper.

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