

# COVID-19 toes in a patient with atrial fibrillation on anticoagulation

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**Key words:** COVID-19, toes, gangrene, coagulopathy

A 76-year-old man with gangrenous toes was referred to the multidisciplinary foot clinic by the community podiatrist.

The patient had a background of atrial fibrillation (he was taking apixaban), abdominal aortic aneurysm and hypertension. He had severe COVID-19 pneumonia requiring hospital admission in November 2021. He did not have diabetes (an HbA<sub>1c</sub> level in March 2022 was 5.9%/49 mmol/mol). During his admission he developed chilblain-like lesions in both feet, more marked in the left foot than the right (Figures 1 and 2). Both feet had good volume pulses and there were no signs of acute limb ischaemia. Ankle brachial pressure index was 0.76 on the left and 0.75 on the right. He was transferred to a community hospital for rehabilitation and was referred to the Vascular Limb Salvage (VALS) clinic for further assessment.

When seen in the VALS clinic in January 2022 he was again noted to have good perfusion and good palpable pulses in both feet, and both feet were warm. Sensation in the feet was normal. There was gangrenous change to the toe pulps of all five toes in the left foot and to the 4th and 5th toes of his right foot, with ischaemic looking changes in the right 1st, 2nd and 3rd toes (Figures 3 and 4). Proximal to these gangrenous changes the toes and forefoot were well perfused. Right toe pressure was normal at 99 mmHg. It was not possible to assess toe pressure in the left foot due to apical necrosis.

The conclusion was that his gangrenous toes were consistent with microvascular circulatory dysfunction and likely to be related to his COVID pneumonitis. There was no evidence of

**Figure 1.** Chilblain-like lesions of the left foot, with violaceous discoloration of the toes, November 2021.



**Figure 2.** Right foot with chilblain-like lesions, November 2021.



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infection of the toes at the time and some of the gangrenous cap to the toe pulps was debrided. As he was frail it was recommended to continue with a conservative management plan, allowing for the gangrenous areas to autoamputate.

He was prescribed two weeks of oral flucloxacillin in February and in March for infection of the left hallux (Figures 5 and 6).

**Figure 3.** Gangrenous changes in the left foot, January 2022.



**Figure 4.** Gangrenous changes in toe pulps of all five toes in the left foot, January 2022.



**Figure 5.** Infected apex left hallux with localised cellulitis, February 2022.



**Figure 6.** Gangrenous changes in toe pulps left apex and left 2nd toe with cellulitis dorsum of foot, March 2022.



The apical necrosis of the right 4th and 5th toes remained unchanged (Figure 7).

When seen in the multidisciplinary foot clinic in April 2022 he had dry gangrene of the left hallux apex and apex of the left 2nd toe with exposed bone (Figures 8 and 9). The apical necrosis of the right 4th and 5th toes had resolved but he reported that the toes were still painful. There was cellulitis on the dorsum of the left foot and he had been prescribed flucloxacillin in the community. The plan was to continue with conservative management with good wound care to allow autoamputation of the gangrenous areas.

### Discussion

There have been several reported cases of COVID-19 infection-induced peripheral arterial thrombosis leading to acute limb ischemia.<sup>1</sup> The mechanism of arterial thrombosis is not fully known, although hypercoagulopathy, hypoxia, endothelial dysfunction, inflammation and cytokine release have been identified as possible contributing factors.<sup>2</sup>

**Figure 7.** Small patches of dry necrosis apex right 4th and 5th toes, March 2022.



**Figure 8.** Dry gangrene of the left hallux apex and apex of the left 2nd toe, April 2022.



**Figure 9.** Dry gangrene of the left hallux apex and apex of the left 2nd toe with bone exposed, April 2022



Distinct from cases of arterial thrombosis that have been associated with COVID-19, COVID-19 has also been associated with a variety of dermatological manifestations, including a viral exanthem, livedo reticularis, urticaria, petechial rashes, and acral pernio-like lesions. These last lesions are patches of erythematous-to-violaceous skin, which can affect the feet and toes ("COVID toes"), hands/fingers, or other locations. It is thought that the lesions may correspond to focal areas of vascular occlusion.<sup>3</sup> The mechanism is unknown but it does not appear to be related to macrovascular occlusive disease or embolism. Microscopic intravascular thrombi have been seen on biopsy of lesions in



### Key messages

- Thromboembolic events may occur in adequately anticoagulated patients with COVID-19.
- The risk of coagulopathy may continue even after acute phase of COVID-19 infection. Therefore it is essential that both patients and physicians are aware of this important complication.
- It is important to be aware of risk factors for developing COVID-19 thromboembolism such as hypertension, diabetes, age over 60 and male gender.

critically ill patients.<sup>4</sup> It has been speculated that the dermatological lesions may be a clinical sign of systemic hypercoagulability. However, acral lesions have also been reported in asymptomatic individuals and those with mild cases of COVID-19.

It is interesting that this patient developed gangrenous toes despite being on anticoagulation (with apixaban) for atrial fibrillation. Thromboembolic events have been reported to occur even in adequately anticoagulated patients with COVID-19.<sup>5</sup>

The risk of coagulopathy may continue even after patient discharge.<sup>1</sup> Therefore it is essential that both patients and physicians are aware of this important complication, and physicians should advise patients to seek urgent medical attention if there is any evidence of this.

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