CASE REPORT

Acute blue finger syndrome: a rare benign cause of acute digit discolouration

Kiran Dhaliwal,^{1,2} Colin Thomas Brewster,³ Sivarajasingham Pakeerathan²

¹Division of Surgery, East Surrey Hospital, Redhill, Surrey, UK
²Accident and emergency, St Georges NHS Trust, London, UK
³Royal Stoke University Hospital, Stoke-on-Trent, Staffordshire, UK

Correspondence to

Miss Kiran Dhaliwal,
 kirandhaliwal50@gmail.com

Accepted 19 December 2018

SUMMARY

Acute blue finger syndrome is a rare benign condition that mimics digital ischaemia. We discuss the case of a 32-year-old woman who presented with a 6-hour history of blue discolouration of the middle finger of the right hand, associated with pain and swelling. There was no history of trauma and this was the first time that the patient had experienced these symptoms. Examination found blue discolouration of the digit primarily on the volar aspect with associated swelling. All investigations, including blood tests, X-rays and Doppler scanning, were normal. The symptoms resolved spontaneously within 48 hours. There were no recurrent episodes or long-term sequelae. Patients presenting with an acutely blue finger need rapid assessment to exclude digit ischaemia. Knowledge of this rare benign condition may prevent unnecessary distress, invasive investigations and potentially harmful treatment of a healthy patient.

BACKGROUND

Acute blue finger syndrome is a rare benign condition that mimics digital ischaemia. Patients present with an acute blue discolouration of a single finger, usually associated with pain and swelling.^{1,2} Patients are most commonly female in their third or fourth decade of life and often have no other medical history of vascular or systemic disease.

Those who present with an acutely blue finger need rapid assessment to exclude digital ischaemia. However, this can be achieved with a thorough history and clinical examination. Knowledge of this rare benign condition may prevent unnecessary distress, invasive investigations and potentially harmful treatment of a healthy patient.

CASE PRESENTATION

A 32-year-old woman presented with a 6-hour history of an acutely blue middle finger of the right hand. This was associated with an aching pain that occurred 2 hours after the onset of digital discolouration. There was no history of trauma or similar discolouration on any other part of the body. This was the first time that the patient had experienced these symptoms and she had no medical history of note. The patient had no personal history of thrombosis but, her mother had a deep vein thrombosis of the leg and grandmother died of a pulmonary embolism. She took the progesterone-only contraceptive pill and had no known drug allergies. The patient was a school teacher who did not smoke and drank 11 units of alcohol every week.

On examination, the middle finger of the right hand had a blue discolouration, primarily on the volar aspect, with associated diffuse swelling. The distal end of the finger was spared. There was no tenderness on palpation but the patient reported an aching pain. The radial, ulnar and brachial pulse were palpable with a good volume, regular rhythm and normal waveforms on handheld Doppler scanning. Allen's test was normal. Capillary refill was less than 2 s. There was normal sensation in the affected digit and within all dermatomes of the upper limb. Neurological examination of the upper limb did not identify any abnormalities. The patient had full power (5/5) in the upper limb and affected digit. There were normal biceps, triceps and supinator reflexes. The patient had a full range of active and passive motion of the hand. Auscultation of the chest found normal heart sounds with no cardiac murmurs audible.

Her observations, including heart rate, respiratory rate, oxygen saturations, blood pressure and temperature were within normal limits. There was no significant difference in the blood pressure recordings between the upper limbs.

INVESTIGATIONS

The patient had routine blood tests including a full blood count, urea and electrolytes, erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), clotting screen (including international normalised ratio (INR), activated partial thromboplastin time (APTT)), d-dimer and rheumatoid factor. All blood results were within the normal range and rheumatoid factor was negative.

An X-ray of the hand was carried out to exclude any trauma. Although the patient did not report

Figure 1 X-ray of middle finger of the right hand: (A) anteroposterior view and (B) lateral view.

© BMJ Publishing Group Limited 2019. No commercial re-use. See rights and permissions. Published by BMJ.

To cite: Dhaliwal K, Brewster CT, Pakeerathan S. *BMJ Case Rep* 2019;**12**:e223365. doi:10.1136/bcr-2017-223365

Figure 2 Example of a normal triphasic waveform on Doppler ultrasound.

any obvious trauma to the finger, a thorough history found that she had been doing an excessive amount of housework few days previously. No bony injury was seen on X-ray (figure 1).

Handheld Doppler scanning revealed normal waveforms of the radial, ulnar and brachial pulses (figure 2).

DIFFERENTIAL DIAGNOSIS

After taking the initial history, the most important differential diagnosis to exclude was an acutely ischaemic digit. As the patient had no relevant medical history and a normal neurovascular examination and Doppler scan, this was deemed an unlikely cause. An X-ray of the hand ruled out an underlying fracture.

TREATMENT

A normal examination and investigations ruled out acute ischaemia. The patient was discharged. She was booked into the review clinic the following morning and also booked into the vascular clinic for outpatient review.

OUTCOME AND FOLLOW-UP

Her symptoms improved spontaneously. The patient was seen in the vascular outpatient clinic 2 days later. The blue discolouration and swelling had resolved completely and there was no further pain. At 20 weeks follow-up, all signs and symptoms remained fully resolved and the patient had not had any further episodes.

DISCUSSION

Acute blue finger syndrome is a benign condition that resolves spontaneously, with no underlying cause or long-term sequelae. In any patient presenting with an acutely blue finger, an underlying vascular cause must be excluded by thorough history, examination and investigation. The most relevant clinical feature of this syndrome is sparing of the distal finger tip.¹³ In comparison, in an acutely ischaemic digit, the whole digit undergoes colour change.

This is a rare syndrome with only four other publications that describe it. It was first reported in 1982 where six patients, all females, reported acute blue discolouration of the finger that resolved spontaneously.² The largest report is by Cowen *et al*, who carried out a retrospective case review of 22 patients (15

female, 7 male), over a 6-year period.⁴ All patients presented with an acute blue discolouration of the finger. After 19 months follow-up, all but five patients had no identifiable underlying cause and were diagnosed with acute blue finger syndrome. Long-term follow-up confirmed the lack of continuing symptoms and adverse prognostic significance for the patient.⁴

Although the condition resolves spontaneous and no further investigation or treatment is necessary, many patients undergo unnecessary and invasive investigations; patients have even been prescribed antiplatelets or anticoagulated.¹⁴ This is likely due to the lack of knowledge about this condition and concern about missing a potentially harmful embolic or ischaemic event. Further investigations that have been carried out in the cases reported in the literature include duplex of the subclavian arteries, CT angiography and MR angiogram.¹²⁴ These are not strictly indicated and should be used at the clinician's discretion if risk factors are suggestive of proximal stenosis, clot or emboli.

Acute blue finger syndrome is a diagnosis of exclusion. Other causes of acute digit discolouration should be excluded by taking a thorough history and examination. It is important to exclude any risk factors for digital ischaemia such as atherosclerotic disease, prothrombotic states or trauma. Given this patient's family history of venous thromboembolism, it was important to exclude an underlying antiphospholipid syndrome. This should be assessed during the history by asking about history of miscarriage, checking FBC for thrombocytopaenia and performing an anticardiolipin antibody screen.

Full clinical examination of the upper limb should be performed. This includes assessment of the neurovascular status of the limb. A full cardiovascular examination should also be carried out, in particular the pulse rate and rhythm (to exclude underlying atrial fibrillation (AF)), blood pressure measurements in both arms and auscultation of the heart sounds.

Bedside tests such as ECG and blood tests, in particular, a clotting screen should be performed. Doppler scanning is a quick, non-invasive and widely available investigation that can aid diagnosis and help to rule out an underlying vascular cause.

Patient's perspective

I was initially very worried by the colour change and pain in my hand. I am very thankful for the care that I received and very relieved to find out that all my tests results were normal. All the symptoms resolved and I have not had any similar episodes since.

Learning points

- ▶ The acute blue finger is a benign condition that mimics digital ischaemia, but has no underlying vascular cause.
- ▶ It is important to carry out a thorough history and examination to exclude any vascular causes that may cause an immediate threat to tissue viability.
- ▶ A history lacking in rheumatological, vascular or embolic phenomena, associated with discolouration that spares the finger tip suggests a diagnosis of acute blue finger syndrome. In contrast, discolouration affecting the entire digit, including the tip, is more suggestive of an ischaemic event.
- ▶ Knowledge of this rare benign condition may prevent unnecessary distress, invasive investigations and potentially harmful treatment of a healthy patient.

X-ray imaging may be indicated if there is a potential history of trauma. ECGs may be indicated in those with signs or symptoms of cardiorespiratory disease, or risk factors for a thrombus or embolus. As previously mentioned, further investigations should only be carried out if clinically indicated with careful consideration of the risks and benefits.

The underlying cause of this syndrome is not yet known. It has been suggested that the underlying mechanism is similar to that of subcutaneous bruising and patients often report bruising easily despite normal platelet counts. In addition, sparing of the finger tip indicates preservation of arterial blood flow, excluding an underlying vascular event.¹

Contributors KD drafted the article, CTB edited and contributed to the manuscript and SP provided input on the content and was responsible for overall supervision.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Khaira HS, Ritttoo D, Vohra RK, *et al*. The non-ischaemic blue finger. *Ann R Coll Surg Engl* 2001;83:154–7.
- 2 Deliss LJ, Wilson JN. Acute blue fingers in women. *J Bone Joint Surg Br* 1982;64:458–9.
- 3 Weinberg I, Jaff MR. Spontaneous blue finger syndrome: a benign process. *Am J Med* 2012;125:e1–e2.
- 4 Cowen R, Richards T, Dharmadasa A, *et al*. The acute blue finger: management and outcome. *Ann R Coll Surg Engl* 2008;90:557–60.

Copyright 2019 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <https://www.bmj.com/company/products-services/rights-and-licensing/permissions/>
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow