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Peripheral gangrene: A rare presentation of systemic lupus erythematosus in a child

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

ABDEF 1,2,3 Vahid Ziaee
BEF 3 Mehrnoush Hassas Yeganeh
BDF 2,3 Mohammad-Hassan Moradinejad

1 Pediatric Rheumatology Research Group, Rheumatology Research Center, Tehran University of Medical Sciences, Tehran, Iran
2 Department of Pediatrics, Tehran University of Medical Sciences, Tehran, Iran
3 Children's Medical Center, Pediatrics Center of Excellence, Tehran University of Medical Sciences, Tehran, Iran

Corresponding Author: Vahid Ziaee, e-mail: ziaee@tums.ac.ir

Patient: Female, 12
Final Diagnosis: Antiphospholipid positive SLE
Symptoms: Gangrene • Raynaud's phenomenon • autoamputation of the terminal phalanx of the second left hand finger
Medication: Prednisolone • mycophenolate mofetil • captopril
Clinical Procedure: Renal Biopsy • treatment of lupus nephritis • control of hypertension
Specialty: Pediatric rheumatology

Objective: Unusual clinical course
Background: SLE in children has many manifestations. In several studies on SLE in children, gangrene and Raynaud phenomenon have been described as a rare manifestation of SLE during its course in children.
Case Report: We present the case of a 12-year-old girl referred to our center, presenting with peripheral gangrene plus Raynaud's phenomenon, who proved to have SLE. Our patient was treated with steroids and mycophenolate mofetil. She appeared to respond to this combination judging by the disappearance of the digital cyanosis, appearance of extremity pulses, and return of renal function.
Conclusions: This case highlights the importance of precise management and awareness of very rare manifestations of a common disease like SLE. Gangrene can be initial symptom of SLE in children. We recommend SLE evolution in all children with gangrene symptom.

Key words: systemic lupus erythematosus • gangrene • Raynaud phenomenon • children

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Background

Gangrene in the extremities is a rare phenomenon in children with systemic lupus erythematosus (SLE) [1]. SLE in children has many manifestations. In a study by Wananukul et al, cutaneous manifestations were shown to be the second most common findings, after renal problems [2]. They considered the malar rash as the most common cutaneous manifestation, but oral ulcer, vasculitis, photosensitivity, alopecia, and discoid lupus erythematosus, although less common, could also be seen [2]. Wananukul et al. have shown Raynaud phenomenon, gangrene, periungual erythema, nail problems, and subacute discoid lupus erythematosus as rare manifestations of SLE in children [2]. In several studies on SLE in children, gangrene and Raynaud phenomenon have been described as a rare manifestation of SLE [1–5]. In adult patients with SLE, these rare symptoms have been described as the presenting symptoms [6,7], but they have not been described as the first and only presenting symptoms of systemic lupus erythematosus in children, although there is 1 report in the literature showing peripheral gangrene as the presenting symptom in infancy [8]. We present the case of a girl referred to our center, presenting with peripheral gangrene plus Raynaud's phenomenon, who proved to have SLE. This case highlights the importance of precise management and awareness of very rare manifestations of a common disease like SLE.

Case Report

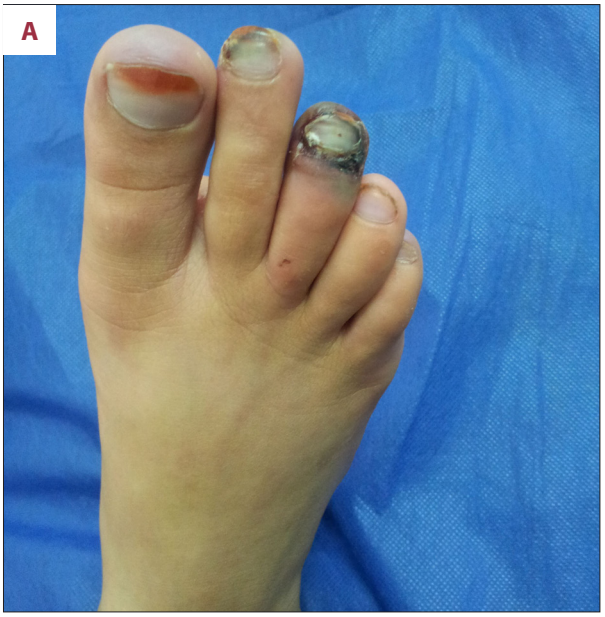
A 12-year-old girl was referred to our center with black discoloration of the tip of the third toe of her right foot beginning 1 week before (Figure 1A).

The patient and her father reported the first symptom as a sudden bluish discoloration in the tip of the forth finger of the left hand 6 months ago. The same discolorations occurred in other fingers as well, one by one. These cyanotic phenomena were painful and of different severities in different fingers. All these cyanotic changes resolved without any intervention and with no sequels, except for the second left hand finger. The cyanosis in this finger did not resolve and led to gangrene and autoamputation of the terminal phalanx of that finger after 3 months (Figure 1B).

She had been delivered preterm by cesarean section and her mother has passed away due to the eclampsia while in labor with her next child. Some similar symptoms were reported in the mother but there was lack of documented evidence. The girl did not report any oral ulcers, seizures, arthralgia, fever, weight loss, or alopecia. Before her admission, she was on Pentoxifylline therapy.

The only positive findings in her physical exam at first encounter were in her extremities. In her right hand, the second and third fingers were cyanotic. In her left hand, the second finger was cyanotic and gangrenous and had an amputated distal phalanx. She also had palmar erythema. In her right foot, all of the fingers were cyanotic and the tips of the second and third fingers were gangrenous. In her left foot, the nail bed of the first finger was cyanotic. The dorsal pedis and posterior tibial pulses were not palpable.

The laboratory data of 1 month before the patient's admission, including hepatitis B and C markers, creatinine, AST, ALT, ESR, CRP, RF, ANA, Anti SSA, and cANCA, were all normal.



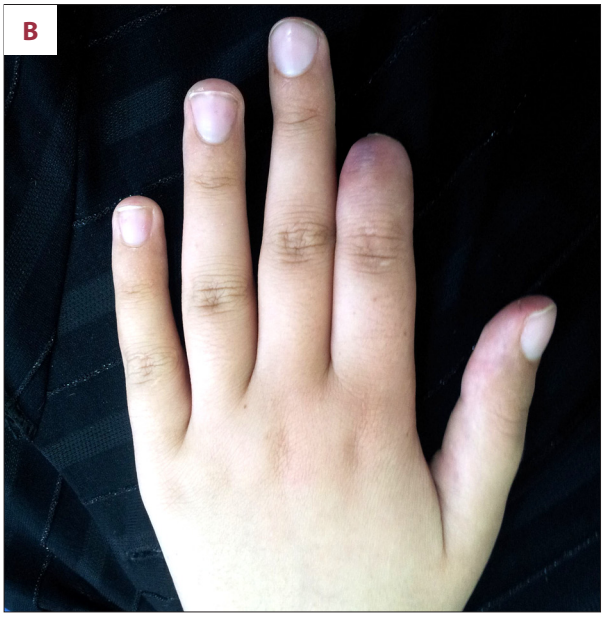


Figure 1. (**A**) The third right toe with gangrene. (**B**) Autoamputation of the terminal phalanx of the second left finger.

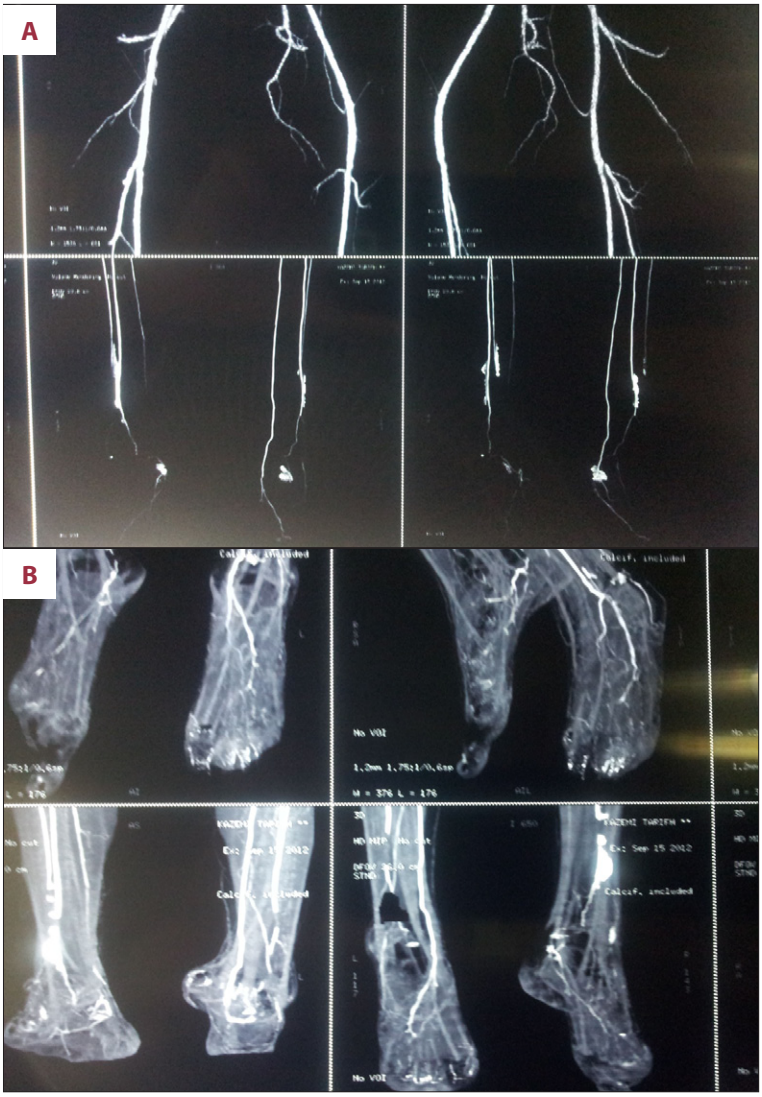


Figure 2. Angiograghic features with irregularity and narrowing in distal branches of anterior and posterior tibialis arteries (right) and un-visualized dorsal and volar arterial arches of feet.

Based on our suspicion, we checked various lab markers and the significant results were:

- WBC of 13 000 with 68/9% PMNs and 23/1% lymphocytes;
- High normal level of BUN and creatinine;
- Urine analysis =+1 protein and 30–35 RBCs per high power field;
- 568 mg protein per 24-hour urine;
- FANA over 1/160;
- Anti ds-DNA: 250 (more than 100 positive);
- Positive ANCA and PANCA;
- Anti-cardiolipin: IgM =38, IgG =280 (more than 12 positive);
- Anti-phospholipid: IgM = Positive, IgG =99 (more than 12 positive);
- Negative direct and indirect coombs test;
- Anti-SCL70 =7;
- Anti-CCP =2.6;
- Normal C3, C4, CH50.

Her chest x-ray, echocardiography, foot x-ray, and abdominal sonography did not have any abnormal findings. Doppler ultrasound exam of the veins of extremities was normal but the flow of both dorsalis pedises arteries was not detected. CT angiography showed a cut-off in the distal third of the proneal artery with collateral formation. Irregularity and narrowing in distal branches of anterior and posterior tibialis arteries were detected. Dorsal and volar arterial arches of the feet were not visualized (Figure 2).

During her admission, she had episodes of high blood pressure (140/85 mmhg). Due to the several hematurias during her admission, a renal biopsy was performed and the result was reported as class 4 lupus nephritis. She was treated with prednisolone (2 mg/kg/day) and mycophenolate mofetil (50 mg/kg/day). In addition, Captopril (25 mg twice daily) was prescribed for hypertension. After 1 month she was symptom free in the extremities, with normal blood flow and normal blood pressure, but she had proteinuria more than 300 mg/24 h. The

dosage of prednisolone was reduced to 1 mg/kg/day and her condition has been under control for 3 months.

Discussion

We described a patient with digital gangrene as the only presenting symptom and the final diagnosis of systemic lupus erythematosus. This patient did not show any other sign or symptoms of systemic lupus erythematosus, although she had digital gangrene for more than 6 months. Gangrene and ischemia in the extremities of children have diverse causes. These can be summarized as [9–15]:

- Hyperviscosity and thromboembolic disorders;
- Mechanical and obstructive disorder;
- Infectious disorders that could cause vasculitides;
- Rheumatological disorders.

Digital ulcers and gangrene are common skin manifestations of connective tissue diseases, especially systemic sclerosis and polyarthritis nodosa, although they are relatively rare in SLE. In SLE a variety of clinical manifestations such as Raynaud's phenomenon, acrocyanosis, livedo patterns, erythematous or violaceous macules, and papules or necrosis are triggered by heterogeneous pathophysiological mechanisms such as vasospasm, vasculitis, or thromboembolism. Gangrene of the extremities is very rare, occurring in about 1% of SLE patients, and most often affects the upper extremities [8]. Endarteritis, although rare, is an important complication of SLE, in which vasculopathy affects arteries in the extremities. Poor perfusion leads to ischemia, with necrosis and infarction of the digits. A standardized macro- and microvascular assessment is necessary to establish the correct diagnosis. The diagnosis can be confirmed by angiography, which shows loss of perfusion and narrowing of the arteries of the extremities and loss of flow to digital arteries [16]. The recommended treatment for vasculitis is steroids. Azathioprine can be added if steroids are not effective.

Gangrene in children with lupus has been described in previous reports [18,18] but there are few reports in children as the only presenting symptom. Shetty et al. reported the first case of SLE presenting with foot and hand gangrene in a neonate [8].

Conclusions

In our case, after confirmation of diagnosis of SLE, we began treatment with steroids and mycophenolate mofetil. She appeared to respond to this combination, judging by the disappearance of the digital cyanosis, appearance of extremity pulses, and return of renal function.

Conflict interest

None.

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