

Peripheral Arterial Disease and Digital Gangrene: A Rare Presentation of Diabetic Hand Syndrome

SANTOKH SINGH¹, GIAN CHAND², SHIV CHARAN³, SAHIL ARORA⁴, PARAMPREET SINGH⁵

ABSTRACT

Digital gangrene in upper limbs may be due to systemic sclerosis, trauma, connective tissue disorders, vasculitic disorders and various myeloproliferative disorders or as a part of tropical diabetes hand syndrome which follows trauma. Peripheral arterial disease in diabetics commonly involves lower limbs. The present case, 45-year-old diabetic, presented with dry gangrene in fingertips of both hands for last two weeks without any history of trauma or lower limb gangrene. On examination and workup of the patient was found to have bilateral upper limb arterio-occlusive disease involving ulnar vessels as a macrovascular complication of diabetes mellitus. This presentation of diabetic hand syndrome is very, very rare, hence being reported.

Key words: Digital gangrene, Upper limb, Tropical diabetes hand syndrome

CASE REPORT

A 45 year old policeman, diabetic and hypothyroid since last two decades on regular insulin and thyroxine with good compliance, presented in medical outdoor with chief complaints of pains in fingers of both hands for 15 days followed by bluish discoloration of fingertips of both the hands which used to get relieved by dipping in lukewarm water. There was history of symmetrical sensory peripheral neuropathy since last two years which had now progressed to absent sensations in tips of little and ring finger of both hands. He denied any history of trauma to hands, no intermittent claudication or ulcers in feet. Patient was non smoker, not an i/v drug abuser, occasional alcoholic for ten years, left alcohol three years back.

Physical examination revealed bilateral weak radial pulses with a regular rate of 78 beats per minute. Both brachials and the peripheral pulses of lower limbs were very well palpable. The blood pressure was 110/80 mmHg in both the upper and the lower limbs with no postural fall. There was dry gangrene on the tips of fourth and the fifth fingers of both the hands involving the nail beds and the palmar aspects as shown in [Table/Fig-1]. The temperature and sensations on the ulnar aspect of both the hands and hypothenar eminence



[Table/Fig-1]: Images showing dry gangrene involving bilateral hands on both the palmar and volar aspects

[Table/Fig-2]: Image showing prayer sign along with gangrenous fingertips

were reduced with mild wasting of the hypothenar muscles. Preacher's sign (Prayer sign) was positive as shown in [Table/Fig-2]. Power of the small muscles of the hand muscles of both sides was normal. Allen's test was positive in both the upper limbs indicating ulnar artery insufficiency. All the sensations in feet up to ankles were reduced. Deep tendon jerks were intact except bilateral ankle jerks which were absent. Fundus examination showed hard exudates bilaterally. Rest all systemic examination was essentially normal.

The laboratory investigations revealed Hb 11.5 gm%, TLC 13,800/cu mm, 82% polymorphs, no toxic granulations, 28% lymphocytes. PBF-normocytic normochromic RBCs with Platelets 5.2 lacs/cumm. Hematocrit 45%, RBCs 4.8 millions/cumm. Random blood glucose was 216 mg%. Blood Urea 124 mg%, Serum Creatinine 4.6 mg%. S. Cholesterol 130 mg%. S. Triglycerides 190 mg%, S. HDL 38 mg%. Serum Sodium 132.9 meq/l, Potassium- 3.8 meq/l, Calcium- 7.54 mg%, corrected Ca - 8.26 mg%, Phosphorous - 6.0 mg%. Ca - Phosphorous product: 49.56 mg²/dl². Serum Bilirubin 0.8 mg%, AST 20 IU/L, ALT 31 IU/L, serum albumin 3.1 gm%, serum globulin 2.2 gm% A:G ratio being 1.4. Urinalysis showed sugar ++, proteins ++, no ketone bodies and 2-4 Leucocytes per HPF. 24 Hr urine protein 1.78 gms. Rheumatoid factor 4.21 units (normal - upto 20 units), ANA was negative and ESR 40 mm in 1st hour. Thyroid profile revealed T3: < 0.25 ng/mL(↓), T4 : 1.70 µg/dl, TSH: 160.78 µIU/ml(↑). Serum PTH levels were 43.7 pg/ml (normal: up to 60 pg/ml). Glycated Hemoglobin (HbA1c) 8.7%. HIV, HBsAg and anti HCV were non-reactive. Electrocardiography was essentially normal.

Echocardiography showed mild concentric LVH, calcification of mitral annulus and tip of the papillary muscle, no RWMA, no evidence of vegetations or clot.

Arterial doppler showed bilateral atherosclerotic arterial disease in all peripheral vessels with absent blood flow in bilateral ulnar arteries and reduced flow in both radial vessels and both lower limb vessels which was not causing any significant flow limiting stenosis. Chest roentgenogram showed unfolded aorta. Ultrasonography of abdomen showed cirrhosis of liver with early portal hypertension with bilateral grade 1 renal medical disease. Patient was diagnosed to be having Type 2 diabetes mellitus with complications in the form of nephropathy, non-proliferative retinopathy, sensorimotor peripheral neuropathy, cheiroarthropathy, peripheral arterial disease resulting in

dry digital gangrene in both the upper limbs with alcoholic cirrhosis (compensated). The patient was put on insulin regimen, thyroxine, antibiotics, statins, cilostazol, calcium supplements and Vitamin B₁₂ supplements. Patient's symptoms improved and was discharged in a stable condition with fasting blood sugar of 107 mg%.

DISCUSSION

Diabetic hand has been reported in literature and its manifestations include limited joint mobility (LJM), Dupuytren's disease, carpal tunnel syndrome, stenosing tenosynovitis, hand infections, hand weakness and various dermatologic conditions like bullous diabeticorum, granuloma annulare and necrobiosis lipoidica diabeticorum [1]. From tropical countries, a different symptom complex, Tropical Diabetic Hand Syndrome (TDHS) has been reported which usually follows minor trauma to hand and is associated with progressive synergistic form of gangrene, fulminant sepsis and is potentially life threatening [2-3].

Of macrovascular complications, peripheral arterial disease usually involves lower limb vessels and its prevalence in Asian countries is 3-6% [4-6] and all over the world, commonly seen in one-third of all patients suffering from diabetes mellitus. Peripheral arterial disease of lower limbs results in diabetic foot complications along with other risk factors like peripheral neuropathy (both somatic and autonomic), peripheral vascular disease, altered biomechanics of the foot, callus formation, microvascular complications, interdigital infections [7]. The case under report is the first of its kind having bilateral fingertips gangrene due to peripheral arterial disease of upper limbs as proven by the doppler showing absent blood flow in bilateral ulnar arteries and has not been mentioned in the literature to the best of

our knowledge. The various causes of digital gangrene in the hand include embolism, vasospasm, vibration trauma and hypothenar hammer syndrome, hypothermic injury (frostbite), ergotism, intra-arterial injections, trauma, iatrogenic injury, connective tissue disorders like scleroderma, systemic lupus erythematosus, rheumatoid arthritis, polyarteritis nodosa, hematological conditions like cold agglutinins, cryoglobulins, antiphospholipid antibody syndrome and polycythemia vera and vascular disorders like atherosclerosis, arteritis, aneurysms and thoracic outlet syndrome [8]. All these causes have been fairly excluded in our patient. We, hereby, report a case of dry, non-traumatic digital gangrene in a diabetic patient which is a very, very rare clinical presentation of diabetic hand syndrome.

REFERENCES

- [1] Peter G. Fitzgibbons, Arnold-Peter C. Weiss. Hand Manifestations of Diabetes Mellitus. *J Hand Surg.* 2008;33A:771 – 75.
- [2] Gill GV, Famuyiwa OO, Rolfe M, Archibald LK. Tropical Diabetic Hand Syndrome. *Lancet.* 1998;351 (9096):113-14.
- [3] Akhmemokhan K, Echekwube P, Bakpa F, Okokhere P. Tropical Diabetic Hand Syndrome: Prevention Through Education. *S Afr J Clin Nutr.* 2011; 24(4):205-06.
- [4] Mohan V, Premalatha G, Shastry NG. Peripheral Vascular Disease in Non- Insulin Dependent Diabetes Mellitus in South India; *Diab Res Clin Pract.* 1995; 27:235-40.
- [5] De Silva D. The Prevalence of Macrovascular Disease and Lipid Abnormalities Amongst Diabetic Patient in Sri Lanka. *Postgrad Med J.* 1993;69: 557-61.
- [6] Pendsey SP. Diabetic Foot Syndrome. *RSSDI Textbook of Diabetes Mellitus, 2nd Edition.* 2008; 2:959-72.
- [7] Andrew J.M. Boulton and David G. Armstrong, The Diabetic Foot, Clinical Diabetes, Translating Research into Practice. Edi. Vivian A Fonseca. *Publisher Elsevier.* 2006; 179-95.
- [8] Prof Jane V Marley. Upper Limb Ischemia. Available from url: www.vasucareascuare.co.za/index_htm_files/Lectures/UpperLimbschaemia-web.pdf.

PARTICULARS OF CONTRIBUTORS:

1. Professor and Head, Department of Medicine, Government Medical College, Amritsar, Punjab, India.
2. Assistant Professor, Department of Medicine, Government Medical College, Amritsar, Punjab, India.
3. Associate Professor, Department of Medicine, Government Medical College, Amritsar, Punjab, India.
4. Junior Resident, Department of Medicine, Government Medical College, Amritsar, Punjab, India.
5. Clinical Associate, Department of Medicine, Government Medical College, Amritsar, Punjab, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Santokh Singh,
Professor and Head, Department of Medicine,
9-FF HIG Flats A-Block Ranjit Avenue Amritsar -143001, Punjab, India.
Phone: 9814313689, E-mail: profsantokhsingh@gmail.com

FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Jan 07, 2013**
Date of Peer Review: **Jul 03, 2013**
Date of Acceptance: **Jul 29, 2013**
Date of Publishing: **Oct 05, 2013**