

Single Case

Swan Neck Deformity Mimicking Claw Hand Caused by Arthritis in Leprosy

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Keywords

Arthritis · Claw hand · Leprosy · Swan neck deformity

Abstract

Swan neck deformity is a hyperextension of the proximal interphalangeal (PIP) joints and flexion of the distal interphalangeal (DIP) joints. Claw hand is a hyperextension of the metacarpal joints and flexion of the PIP joints, accompanied by reduced motor strength. A 23-year-old female, who was released from leprosy treatment, presented with a bend of the second to fifth fingers of both hands. There was hyperextension of the PIP joints and flexion of the DIP joints from the second to fifth fingers of both hands, thickening of the ulnar nerves, and hypoesthesia without motor impairment of the fourth and fifth fingers of both hands. Radiograph examination revealed cupping of the base of the proximal phalangeal joints of the second, third, and fifth fingers of the left hand and of the second and fifth fingers of the right hand. Additionally, narrowing of the metacarpophalangeal joints of the second, third, and fifth fingers of the right hand and sclerosis of the second and fifth fingers of the right hand were also observed. Claw hand is frequently reported in leprosy, while swan neck deformity is frequently reported in rheumatoid arthritis. To our knowledge, this is the first reported case with swan neck deformity caused by arthritis in leprosy.

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Introduction

Leprosy may cause various hand and foot deformities [1]. One of the etiologies of deformity in leprosy is the infiltration with *Mycobacterium leprae* [2, 3]. *M. leprae* can destroy bone trabeculae, which are eventually replaced by granulomatous tissue which also invades the periosteum. Other etiologies for deformity in leprosy are xerotic and hypoanesthetic skin, which has been subjected to continuous traumas due to cutaneous infection and ulceration [3]. Arthritis in leprosy is a form of osteoarticular involvement that can be specific, such as *M. leprae* osteitis. It may also occur secondary to denervated tissue injury [4].

Hand deformities in leprosy can manifest as swan neck deformity [5] or claw hand [6–8]. Swan neck deformity is a condition characterized by hyperextension of the proximal interphalangeal (PIP) joints and flexion of the distal interphalangeal (DIP) joints [9]. It is frequently reported to be caused by rheumatoid arthritis (RA) [10, 11]. Claw hand deformity is characterized by flexion of the PIP joints and extension of the metacarpophalangeal joints due to peripheral neuropathy [6, 7], which is often reported as a complication of leprosy [7, 8].

Case Presentation

A 23-year-old Indonesian female presented with a bend of the second to fifth fingers of both hands. She had been suffering from multiple joint pain, swelling, deformities, and fever as well as red patches on her face and erythematous nodules on both arms and legs for 4 years. She was initially diagnosed with systemic lupus erythematosus in the Internal Medicine Department, but after being treated, there was no improvement of her condition. She was then transferred to our department. We found a bacterial index of 4+ and a morphological index of 59.7% from the slit skin smear examination. The patient was then diagnosed with lepromatous leprosy with second-grade deformity and erythema nodosum leprosum reaction. She received multidrug therapy based on the World Health Organization multidrug regimen for 12 months along with prednisone for 6 months. One year after release from treatment, multiple erythematous nodules reappeared, and she was diagnosed with erythema nodosum leprosum and received prednisone for 3 more months.

In the current examination, we found bilateral madarosis and hyperextension of the PIP joints and flexion of the DIP joints of the second to fifth fingers of both hands (Fig. 1, 2). Neurological examinations showed ulnar nerve thickening by palpation and hypoesthesia without motor impairment of the fourth and fifth fingers of both hands. Bacteriological examination found no acid-fast bacilli. Radiograph examination revealed resorption of the end of the distal phalanges, cupping form deformity of the base of the proximal phalangeal joints of the second, third, and fifth fingers of the left hand and of the second and fifth fingers of the right hand. In addition, narrowing of the metacarpophalangeal joints of the second, third, and fifth fingers of the right hand and sclerosis of the second and fifth fingers of the right hand were also observed (Fig. 3, 4). These results indicated abnormalities due to leprosy. Assessment performed by the Department of Physical and Rehabilitative Medicine showed no motor impairment, and the patient was diagnosed with swan neck deformity of the second to fifth fingers of both hands.

Discussion

Arthritis in leprosy can be divided into (1) Charcot joints; (2) septic arthritis; (3) acute polyarthritis of leprosy reaction; and (4) chronic arthritis. Chronic arthritis in leprosy is identical to RA, a symmetrical polyarthritis with chronic onset, while arthritis due to leprosy reaction involves multiple joints, is symmetrical, and affects smaller joints of the hands and feet, resembling RA with acute onset [5]. The differential diagnosis of RA or systemic lupus erythematosus can be made if the joint manifestation has occurred prior to the diagnosis of leprosy [4].

Arthritis due to leprosy may cause joint destruction and eventually leads to Boutonnière and swan neck deformities [5]. Arthralgia and swelling of the joints were observed in this patient. Her radiograph examination also showed damaged joints, which is consistent with the deformity caused by arthritis due to leprosy.

Median and ulnar peripheral neuropathy may also cause muscle weakness and lead to claw hand deformity [6]. In such cases, hyperextension of the PIP joints and flexion of the DIP joints, joint stiffness, and bilateral ulnar nerve thickening may occur, but since there was no muscle weakness and contracture, the patient was diagnosed with swan neck deformity.

Statement of Ethics

The authors have obtained the patient's written informed consent.

Disclosure Statement

The authors have no conflicts of interest to disclose. There was no source of funding for this work.

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Fig. 1. Swan neck deformities of the hand.

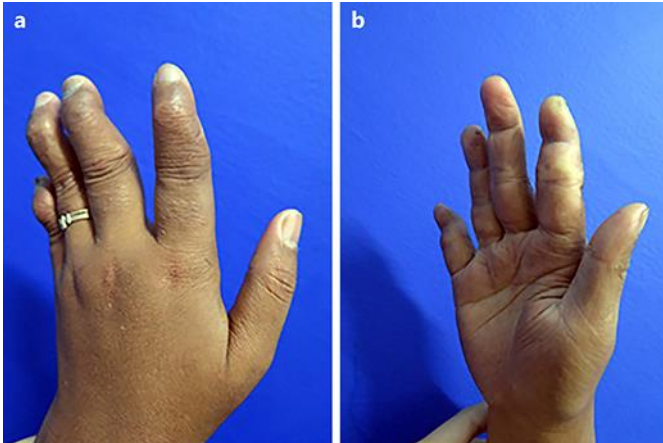


Fig. 2. Swan neck deformities in the left (a) and right hand (b). Hyperextension of the proximal interphalangeal and flexion of the distal interphalangeal joints of the second to fifth fingers of both hands.



Fig. 3. Hand radiographs revealed resorption of the end of the distal phalanges, cupping form deformity of the base of the proximal phalangeal joints of the second, third, and fifth fingers of the left hand and of the second and fifth fingers of the right hand. In addition, narrowing of the metacarpophalangeal joints of the second, third, and fifth fingers of the right hand and sclerosis of the second and fifth fingers of the right hand were also observed. Oblique view.

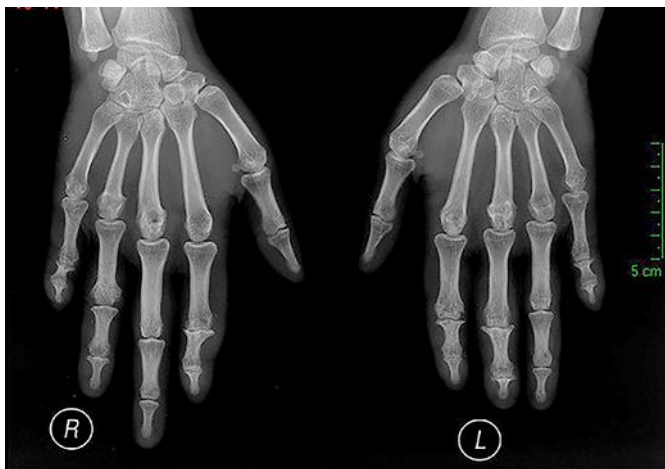


Fig. 4. Posterior-anterior view. For a description, see figure legend 3.