



Pachydermodactyly in poultry workers: A report of 2 cases

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Abstract

Pachydermodactyly (PDD) is an, acquired form of digital fibromatosis. It is commonly found in poultry workers, and can be disabling, causing significant pain, deformity, and loss of function. Many poultry processing plants have contractual relationships with primary care or urgent care practices for occupational health and industrial injuries. We describe two cases of PDD from chicken catching treated at an Urgent Care Facility. Familiarity with this condition can improve diagnostic accuracy, treatment, and prevention of long-term disability.

Keywords: Pachydermodactyly, poultry, workers, hands, chickens

Introduction

A thirty- two year old white male who has been employed as a chicken catcher at a poultry processing plant in West Virginia presented with a six month history of progressively worsening pain, stiffness and swelling to the proximal inter-phalangeal joints of his right and left hands. He denied any other joint pain or swelling and he denied any recent injury or fracture.

On examination he was noted to have diffuse soft-tissue swelling of the proximal inter-phalangeal joints of the third and fourth digits of both hands. Range of motion was noted to be markedly decreased, and there was tenderness to palpation over the lateral aspect of the joint. (See figure 1).

pain, stiffness, and swelling of his left hand involving the second, third and fourth digits. The patient reported that he had worked continuously as a chicken catcher since his arrival in the United States 7 years ago. He denied any previous injuries to his hand or any other joint swelling.

On examination there was marked swelling of the left hand second, third and fourth digits over the PIP joints. There was tenderness to palpation to the area. Flexion and extension were markedly limited in the PIP joints (**See Figure 2**).



Fig 1

Radiologic and lab analysis were within normal limits. The patient was diagnosed with PDD and was referred to his plant occupational health services for a retraining on a different job.

Case Report: #2

A 22 year old Hispanic male who is employed as a chicken catcher at a poultry processing plant in West Virginia presented to an Urgent Care facility with a four month history of worsening



Fig 2

X-rays and rheumatologic serology were within normal limits. Given his occupational history and negative work up, he was diagnosed with PDD and referred to occupational health services for job reassignment.

Background

PDD is an acquired form of digital fibromatosis. It is clinically

characterized by a painful soft tissue swelling of the lateral aspects of the proximal interphalangeal joints of the fingers. Most reported cases involve young, otherwise healthy males with a mean age of 21.2 years (Reference 4, 5, 7, 8). The pathogenesis of PDD is unknown but it is believed to be due to repeated mechanical injury to the skin (Reference 2 & 3). Poultry processing workers, particularly chicken catchers, are exposed to repetitive trauma of the hands on a daily basis. West Virginia is a predominantly rural state and poultry processing is a major part of the economy (Reference 12).

According to the National Chicken Council (2016) there are approximately 1,339,900 poultry workers working directly or indirectly in the poultry processing industry. According to the North American Meat Institute (NAMI) in 2013 the poultry industry processed 8.6 billion chickens in 6278 federally inspected poultry processing plants in the US. It is estimated that about half of poultry processing worker are Latino, half are women, and a quarter do not possess legal documents to work in the US (NCFH, 2014). Chicken catchers are more likely to be

male, Latino, and undocumented. Chicken catchers are typically the highest paid manual workers in the poultry processing industry earning \$92 dollars per day according to the National Center for Farmworker Health (2014).

The injury rate in poultry processing is among the highest in food manufacturing (Reference 1). While virtually all jobs in poultry processing plants are mechanized or semi-mechanized, the job of chicken catcher, by virtue of the work itself, must be done by human hands (Reference 3). The process starts in chicken houses, where between 10,000 to 25,000 chicks are raised for about 6-8 weeks until they are grown and ready to be taken to the processing plant (Reference 2)(see figure 3). To transport the chickens to the processing plant, chicken catchers gather the chickens, stuffing the legs of the chickens between two fingers sometimes carrying as many as up to 8 to 10 birds at a time in one hand (see figure 4). These chickens are then stuffed into cages and the cages are then transported to the poultry processing plant for further rendering. The average poultry plant in the United States processes 250,000 chickens a day (Reference 1).



Fig 3



Fig 4

Typical injuries for poultry processing plant workers include carpal tunnel syndrome, tendinitis, lacerations, and sprains and strains. PDD is a common occurrence in poultry industry workers particularly chicken catchers and live hangers. Often urgent care facilities are the first point of entry into the health care system for a poultry worker with PDD.

PDD was first described by Bazex in 1973 (Reference 8). It is an acquired disorder affecting young males almost exclusively although it has been reported in females. Clinically it is characterized by painful soft tissue swelling over the dorsal and lateral aspects of the proximal phalanges with associated stiffness, and progressive loss of range of motion. Distal involvement is rare. Involvement of only one finger is extremely rare.

Histopathology of PDD

Biopsy from these lesions shows hyperkeratosis, hypergranulosis, and overlying thickened dermis consisting of

increased collagen arranged haphazardly with a slight proliferation of blood vessels. Little or no inflammatory cells are seen. The used of special stains show increased deposition of collagen and mucin in the dermis. Normal skin collagen profile shows mostly collagen type 7, but the most common collagen types isolated from the skin in PDD are types 3 and 5(reference 4).

Lab Analysis

Lab analysis of patients with PDD fails to reveal any inflammatory changes, and/or auto-antibodies or markers for lupus or rheumatoid arthritis. ESR and CRP are also normal (reference 6).

Radiographic Findings

Plain x-rays of the hands reveal no osseous abnormality. MRI imaging shows fusiform swelling of the soft tissues around the proximal inter-phalangeal joints of the hands, with sparing of the

tendons and ligaments. No periosteal reaction is noted, and there is no capsular involvement (reference 11).

Differential Diagnosis

The differential diagnosis of PDD should include knuckle pads, juvenile rheumatoid arthritis, juvenile idiopathic arthritis and gout.

Treatment

Although there is no well documented treatment for PDD, other than stopping the offending activity, some authors have reported successful treatment of this condition with intra-lesion injection of triamcinolone or oral Tranilast (Reference 10). Our research on this population of workers shows that individuals who continue to work as chicken catchers have irreversible changes even upon cessation of the activity.

Conclusion

PDD is a disabling condition that can cause pain, swelling, and progressive deformity of the proximal inter-phalangeal joints in poultry workers and can lead to permanent disability.

With over 1.3 million poultry workers in the US, it is likely that healthcare providers will encounter this condition in the course of their careers. It is prudent, therefore, that providers become familiar with PDD, particularly, the etiology, presentation, physical features, and treatment options.

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