

Original research article**Compound dorsal ganglion with multiple riziform bodies in an elderly male**

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Abstract

Compound dorsal ganglion is a rare entity encountered in clinical practice. Patients typically approach with nonspecific clinical signs and symptoms. The characteristic feature in these patients is the presence of irregular, firm and multiloculated swelling in the dorsum of the hand which contains riziform bodies also known as 'rice bodies'. It is usually associated with several diagnostic and treatment challenges. Regarding their genesis, several theories have been postulated. Here in, we report the occurrence of riziform bodies in an elderly male, confirmed by MRI and operative findings. It was successfully treated with drainage and surgical excision.

Keywords: Compound dorsal ganglion, riziform bodies, rice bodies, multiloculated swelling, surgical excision

Introduction

Compound dorsal ganglion conventionally known as tuberculous tenosynovitis of the extensor tendons of the wrist and hands. Its coexistence with the characteristic riziform bodies, also known as rice bodies, is exceedingly rare in clinical practice. It usually affects the wrist and the hand and accounts for 5% of all musculoskeletal tuberculosis cases ^[1, 2]. Patients typically present with a wide range of clinical symptoms, such as reduced range of motion, swelling around the wrist and the hand and gradually worsening wrist pain. Rice body formation in the hand is a nonspecific chronic inflammatory condition. Currently, the exact cause of rice body formation remains unclear. It is most commonly illustrated in rheumatoid arthritis, pulmonary tuberculosis, juvenile arthritis, serum-negative arthritis, osteoarthritis, suppurative arthritis, trauma, chronic bursitis, and other infectious diseases such as mycobacterium tuberculosis and atypical mycobacterium. It is routinely diagnosed by magnetic resonance imaging (MRI). In our case, a potential diagnosis of rheumatoid arthritis and gout was excluded through laboratory findings. Cartridge-Based Nucleic Acid Amplification Test (CBNAAT) came out to be positive in the index case. We here describe a rare case report of a patient with isolated wrist tenosynovitis with rice bodies on Magnetic Resonance Imaging (MRI) which came positive on CBNAAT. Riziform bodies are typically found in the knee and shoulder joints. It is very uncommon to see rice body's formation in the hand. It is usually associated with several diagnostic and treatment challenges.

Case Report

A 97-year-old male presented in the orthopaedic department with pain in the metacarpophalangeal joint along with restricted movement for more than six months. Over the previous two months, the patient's symptoms had considerably worsened. The Patient has a history of type 2 diabetes with HbA1C of 9.1%. Otherwise, the patient has no significant prior family history and no history of trauma, rheumatoid arthritis, autoimmune disorders or other infectious diseases. General Physical examination revealed a mass in the middle of the transverse palmar crease of the right hand, approximately 3 X 1.5 cm, with

normal local skin temperature, no obvious ulcer formation, firm texture, irregular margins, no local tenderness, painful wrist movement and significantly decreased range of motion. The contralateral fingers were normal. The patient had no history of fever or weight loss. Extensive laboratory and ancillary tests were done including blood routine, liver and kidney function, erythrocyte sedimentation rate, high-sensitivity C-reactive protein, rheumatoid factor, CBNAAT and autoantibodies. CBNAAT came out to be positive whereas all other tests came out to be negative. MRI of the hand showed multiple well-defined fluid intensity collections in the synovial sheath of all extensor compartments of the hand, suggestive of rice bodies. The patient underwent tenosynovectomy with synovectomy of the right middle finger tendon sheath under plexus block anaesthesia. A keyhole-shaped incision was given intraoperatively along the right hand's extensor tendon, and white granule-like tissue encircled the tendon sheath. Both the tendon sheath and the joint fluid showed signs of synovial hyperplasia and a significant number of rice bodies. Tissue was sent for histopathological assessment, which showed histiocytic collection and the presence of lymphocytes. No postoperative complications were noted. The activity of the patient's wrist movement improved significantly post-surgery.



Fig 1: Clinical and radiographic images

Discussion

Tubercular tenosynovitis exclusively targets the wrist and volar aspect of the hand, accounting for approximately 5% of cases of osteoarticular tuberculosis [4]. As with our index case, the patient usually presents with an insidious, slow-growing, sausage-like mass along the inflamed tendon with minimal or no pain. Our patient also had a history of uncontrolled diabetes mellitus. Preoperative diagnosis is difficult because symptoms may be absent or unspecific, with neurological symptoms similar to those in carpal tunnel syndrome. Differential diagnosis includes pigmented villonodular synovitis, synovial chondromatosis, tuberculous or non-tuberculous tenosynovitis and sarcoidosis. Mycobacterium tuberculosis infection is mostly seen in debilitated patients with compromised cell-mediated immunity. The two genesis theories regarding the pathogenesis of tubercular tenosynovitis are direct inoculation and hematogenous dissemination from a primary focus. Infection appears to start in the synovium and then gradually spreads to the tendons and even the bones.

The main obstacle remains the absence of particular clinical manifestations that would enable the diagnosis of several other disorders, such as sarcoidosis, ganglion, rheumatoid arthritis (RA), gouty arthritis, brucellosis, pyogenic and fungal infections, and other mycobacterial infections. Rice body formation is usually associated with rheumatoid arthritis or tuberculosis. In the present case, the causative agent was Mycobacterium tuberculosis. Rice bodies are thought to be non-specific responses and byproducts of secondary degeneration, hyperplasia, and persistent inflammation. It is mainly composed of fibrin and a modest quantity of collagen. On their surface, some additionally have lipids and neuraminidase. Chung and his colleagues found that rice bodies and the synovium contained equal proportions of types I and III collagen, and type AB collagen and speculated that the formation of rice grains is related to synovial microinfarction.⁶ Berg and his team also observed that some rice bodies contain vascular tissue, indicating that they were previously connected to the synovium. Non-vascular-type rice bodies are likely to be further degraded from vascular-type ones [7, 8]. In summary, we consider that synovial microinfarction and synovial B cells work together and lead to the formation of rice bodies.

After synovial microinfarction, sloughing of the infarcted tissue into the synovial fluid forms the initial rice bodies-synovial fragments that contain inflammatory cells, synovial B cells, and vascular tissue. The final rice bodies are gradually formed by the secretion of fibrin from synovial B cells and the deposition of fibrin in synovium.

Tenosynovitis with abundant "rice bodies" is rarely reported in the literature [1-8]. Rheumatic disease, trauma and fungal infection were also reported as causes of rice bodies' tenosynovitis. However, cases of rice body tenosynovitis with tubercular aetiology were rarely reported in the literature.

Bacterial cultures, Ziehl-Neelsen staining and CBNAAT remain the most commonly used and reliable methods in detecting mycobacterial infection. The presence of caseous necrosis in the synovium or rice bodies containing tubercular material is most helpful in diagnosing tuberculous mycobacteriosis.

Synovectomy is indicated in all cases, especially when associated with nerve compression syndromes, but also to avoid complications such as spontaneous tendon rupture and possible functional limitations. Synovectomy with the removal of all rice bodies is the treatment of choice. Postoperative outcomes are usually good.

Conclusion

Compound dorsal ganglion is a disease with great diagnostic challenge due to its masquerade clinical presentation and is confirmed by histopathological examination. Early diagnosis, complete debulking, and adjuvant antitubercular therapy prevents the further spread of disease and improves the patient's function. Even with benign-appearing swelling, we ought to maintain a high level of suspicion. The radiological and pathological examinations are important in this case with rice bodies because the four closest differentials, rheumatoid arthritis, tubercular tenosynovitis, seronegative inflammatory arthritis and idiopathic tenosynovitis have quite distinct treatment approaches.

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