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CASE REPORT

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Tuberculous tenosynovitis of the flexor tendons of the wrist: MR imaging with pathologic correlation

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Case report

A 28-year-old male Mexican farmer presented with a 5-year history of a mass located on the volar aspect of the right forearm and wrist. The patient experienced wrist pain and intermittent numbness with decreased range of motion. The mass had remained unchanged in size for the previous 2 years. Physical examination revealed a soft tissue mass on the volar aspect of the distal forearm extending into the wrist (Fig. 1). The mass measured 9 cm in length and 5 cm at its maximum width and was mildly compressible but did not transilluminate. Percutaneous aspiration yielded a small amount of straw-colored fluid. In addition, two smaller separate subcutaneous masses were located at the right second metacarpophalangeal joint and adjacent to the right olecranon process. MR imaging (Fig. 2) revealed a well-defined mass in the distal forearm, measuring 8 cm in length and located volar to the pronator quadratus muscle. The mass was hourglass shaped (Fig. 2E), extending through the carpal tunnel to the level of the metacarpal heads. On T1-weighted images (Fig. 2A, C), the MR signal of the mass was intermediate and isointense with that of muscle. On T2-weighted images (Fig. 2B, D), there was predominantly high signal, with multiple 3- to 4-mm foci of low-to-intermediate signal in an even distribution throughout the mass. The lesion surrounded the superficial and deep flexor digitorum tendons, but not the flexor carpi radialis tendon. As the mass passed through the carpal tunnel, it bowed the flexor retinaculum mildly in a volar direction and displaced the median nerve in a radial direction. Open biopsy of the mass was performed, and a diagnosis of tuberculous tenosynovitis of the flexor tendons of the wrist was made.

Biopsy revealed a thickly encapsulated mass containing fluid as well as innumerable 3- to 4-mm soft tissue “rice bodies” (Fig. 3). Histologic examination of the capsular tissue showed chronic granulomatous inflammation with numerous acid fast organisms, diagnostic of tuberculosis. Cultures confirmed the presence of *Mycobacterium tuberculosis.* The subcutaneous lesion at the olecranon process was also biopsied, yielding identical results. Complete surgical resection was carried out shortly thereafter.

Fig. 1 Clinical photograph taken at presentation shows soft tissue swelling of the forearm, wrist, and volar surface of the right hand

Discussion

Tuberculous tenosynovitis of the hand and wrist is an uncommon but well-documented manifestation of extrapulmonary tuberculosis [1–4]. This condition is often not diagnosed until late in the course of the disease due to its slow progression and indolent symptoms, and tuberculous tenosynovitis is often misdiagnosed as a noninfectious inflammatory con-

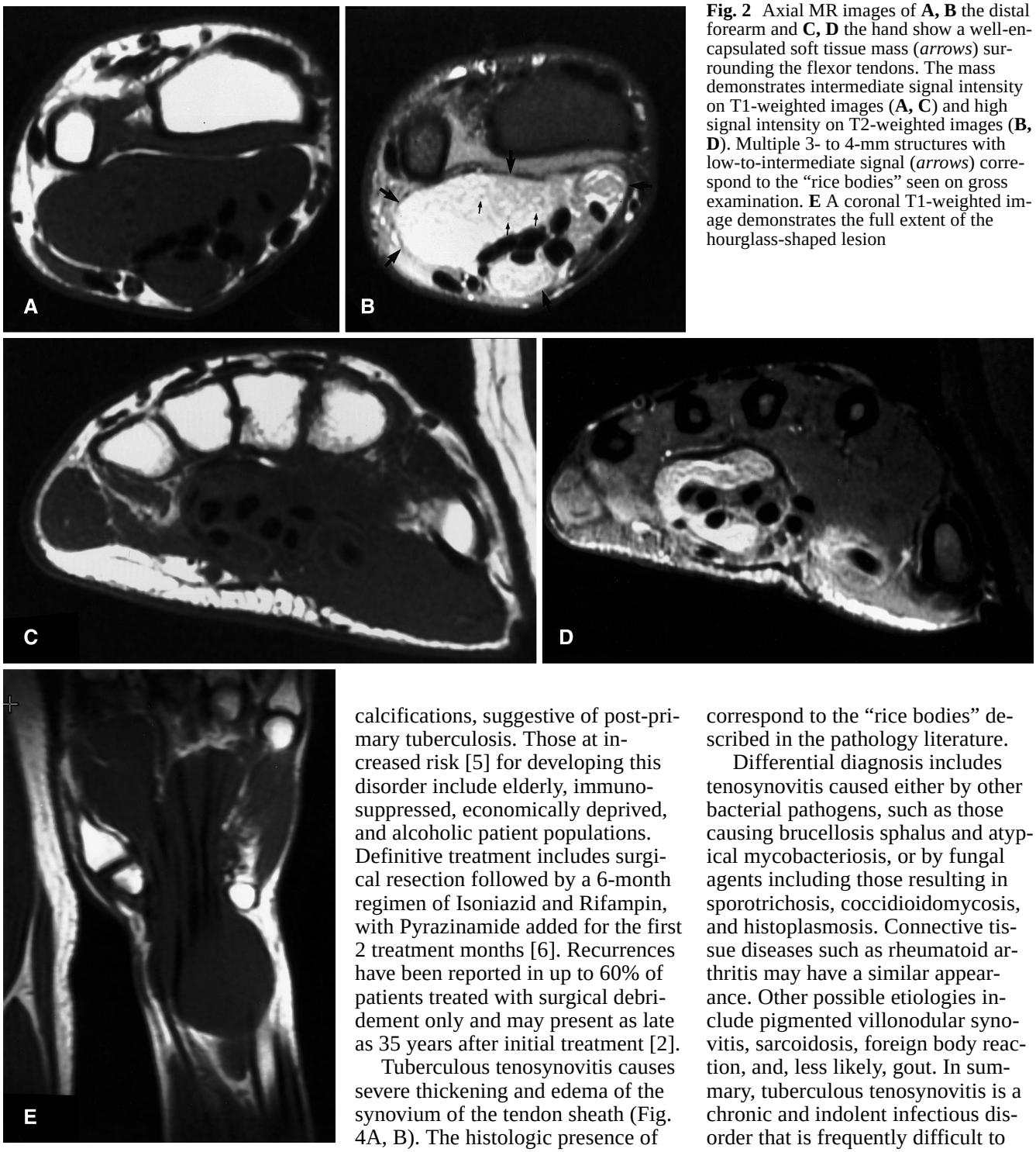
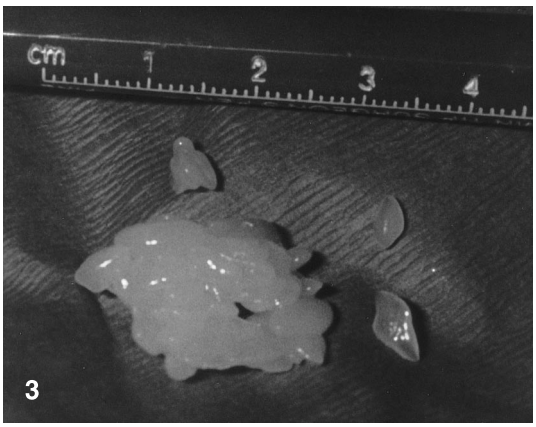


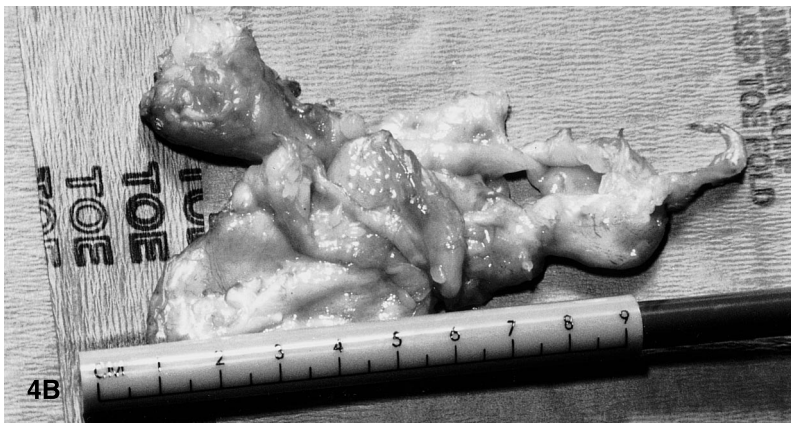
Fig. 2 Axial MR images of **A, B** the distal forearm and **C, D** the hand show a well-encapsulated soft tissue mass (*arrows*) surrounding the flexor tendons. The mass demonstrates intermediate signal intensity on T1-weighted images (**A, C**) and high signal intensity on T2-weighted images (**B, D**). Multiple 3- to 4-mm structures with low-to-intermediate signal (*arrows*) correspond to the "rice bodies" seen on gross examination. **E** A coronal T1-weighted image demonstrates the full extent of the hourglass-shaped lesion

dition. Patients usually have evidence of granulomatous disease elsewhere, most frequently in the chest. Our patient's chest radiograph revealed extensive fibrotic changes and calcifications, suggestive of post-primary tuberculosis. Those at increased risk [5] for developing this disorder include elderly, immunosuppressed, economically deprived, and alcoholic patient populations. Definitive treatment includes surgical resection followed by a 6-month regimen of Isoniazid and Rifampin, with Pyrazinamide added for the first 2 treatment months [6]. Recurrences have been reported in up to 60% of patients treated with surgical debridement only and may present as late as 35 years after initial treatment [2].

Tuberculous tenosynovitis causes severe thickening and edema of the synovium of the tendon sheath (Fig. 4A, B). The histologic presence of "rice bodies" within these lesions is common and was described already in 1957 [7]. The MR appearance has not been previously described. Our case suggests that the multiple, small, low-to-intermediate signal structures on T2-weighted images correspond to the "rice bodies" described in the pathology literature.

Differential diagnosis includes tenosynovitis caused either by other bacterial pathogens, such as those causing brucellosis sphalus and atypical mycobacteriosis, or by fungal agents including those resulting in sporotrichosis, coccidioidomycosis, and histoplasmosis. Connective tissue diseases such as rheumatoid arthritis may have a similar appearance. Other possible etiologies include pigmented villonodular synovitis, sarcoidosis, foreign body reaction, and, less likely, gout. In summary, tuberculous tenosynovitis is a chronic and indolent infectious disorder that is frequently difficult to diagnose clinically. Our case showed, on prebiopsy MR images, large effusions distending the flexor tendon sheaths of the wrist, with multiple small intermediate-to-low signal structures within the fluid. These structures correlated with the





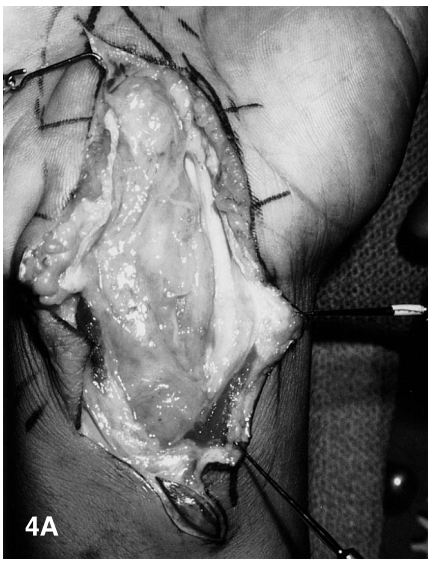


Fig. 3 Gross pathologic specimen photograph shows a portion of resected material from the tendon sheath, consisting of 3- to 4-mm diameter soft tissue "rice bodies"

Fig. 4 Intraoperative photographs show the mass **A** exposed through a volar longitudinal incision and **B** dissected free

gross pathology of "rice bodies" found at surgical resection. This MR feature may aid in the diagnosis of tuberculous tenosynovitis by virtue of its correlation with the pathologic findings.

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