POLYTENOSYNOVITIS CAUSED BY TOXOPLASMA GONDII

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Two cases are reported of polytenosynovitis involving the wrists and ankles caused by toxoplasmosis, together with the investigations that led to the diagnosis. Medical and surgical treatment of the first patient and medical treatment only of the second patient gave satisfactory results.

Toxoplasmosis is a protozoal infection of man and of several other mammals, especially the cat, and of some reptiles. The oocytes of Toxoplasma gondii are found in the intestine of the cat and are infectious. The trophozoites are able to multiply intracellularly in extra-intestinal tissues and form cysts containing large numbers of organisms.

The disease in humans has been recognised only in recent years, and because of its various manifestations it enters into the differential diagnosis of many other disorders. The congenital form can be severe, with lesions of the central nervous system and eyes; the child is often mentally retarded and liable to have convulsions (Duraiswami 1952). The acquired form may present as an acute lymphadenopathy, as a severe disseminated visceral illness, or as ocular disease, but the infection may be latent and subclinical (Knight 1971).

According to the literature the locomotor system is rarely affected, though lesions of bone caused by congenital toxoplasmosis are known to occur (Milgram 1974) and myositis or polymyositis has also been reported (Chandar, Mair and Mair 1968). Arthritis with peri-articular swelling has been described by Averina (1966), and this, said to be in combination with rheumatoid arthritis, has again been reported by Ippolito, Giacovazzo, Badalamenti and Spagna (1968). Thiers, Coudert, Romagny and Garin (1951) have given an account of two cases of toxoplasmosis with synovitis and tendovaginitis of the wrist and ankle regions, and we have encountered two similar cases.

CASE REPORTS

Case 1 — A man aged fifty, a railway overhead-line mechanic, was admitted to the Institute because of increasing weakness of the hands and swelling of the wrists and ankles. He had undergone an operation for osteomyelitis of the left tibia in 1941 and another in 1954 because a recurrence was suspected though not confirmed. Two years before admission his right wrist became swollen and a year later the left also. Swellings then developed gradually around both ankles. He tired easily and occasionally had pyrexia.

Clinical examination revealed soft, slightly elastic and tender swellings on both aspects of the right wrist and hand. On his left hand a palmar swelling extended to the ulnar side (Fig. 1). The power of grip in both hands was markedly reduced. Similar but smaller swellings were found on the dorsum of each foot, on the lateral side of the left ankle and on both sides of the right calcaneal tendon (Fig. 2). The region of the left knee was slightly swollen. The spleen and liver were slightly enlarged. Radiographs of the affected areas revealed small sharply defined cysts in the right medial malleolus, talus and calcaneus.

The laboratory findings were as follows: erythrocyte sedimentation rate (ESR) 14 millimetres/1 hour; white cell count 10,000 per cubic millimetre (or in SI units 100 x 10⁹/L) with 6 per cent monocytes; urine, scanty red and white cells; C reactive protein (CRP) positive; and liver function tests normal. The serum uric acid level, the anti-streptolysin-O titre (AST) and the latex test for rheumatoid factor were all normal. Later examination of the urine showed a raised level of urobilinogen, and cellulose-acetate electrophoresis showed a slightly increased alpha-2 globulin level. The agglutination test for brucellosis by Knight’s method was negative.

Complement-fixing antibodies to Toxoplasma were found in September 1974 at a dilution of 1:10, and in January and June 1975 at 1:20. The antigens were produced according to the method described by Jíra and Bozdéch in 1960.

Treatment — Several operations were performed for the polytenosynovitis causing the main complaints. The first, on the dorsum of the left foot, revealed the swollen tendon sheaths thickened and brownish-yellow, an excess of synovial fluid straw-yellow in colour and numerous “rice-bodies”. The tendon sheaths were freely excised. Similar operations were later performed on the tendon sheaths of the right wrist and palm (Fig. 3), of the left wrist, and of the peronei on both sides. The findings were similar.

The patient was also treated medically for three weeks with pyrimethamine (25 milligrams daily), sulphonamide (3 grams daily) and folic acid (18 milligrams daily), the course being repeated six months later.

There was no recurrence in the affected areas and no further symptoms. The bouts of pyrexia ceased and strength returned to the hands.

Further investigations — Material was prepared for animal inoculation from synovium obtained at the operation on the right hand. The tissue was cut up with scissors, suspended in physiological salt solution and filtered through sterile gauze. Three mice were injected intraperitoneally, each with 1 millilitre of filtrate. One mouse showed signs of Toxoplasma infection on the seventh day and died on the ninth; microscopic examination of the peritoneal washings revealed high
Case I. Figure 1—to show the swelling of both wrists and palms. Figure 2—to show bilateral swelling in the region of the calcaneal and peroneal tendons.

Case I. Figure 3—A photograph taken at operation on the palm of the right hand, with rice-bodies appearing on incision of the flexor tendon sheaths.

Case I. Figure 4—a microscopic section showing hypercellular granulation tissue next to an extensive area of necrosis. (Haematoxylin and eosin × 140.) Figure 5—Histiocytes in the necrotic tissue are seen to contain small corpuscles of Toxoplasma gondii in the cytoplasm. (Periodic-acid-Schiff × 400.) Figure 6—Showing pseudocysts in the necrotic tissue. Some of the nuclei are still recognisable, and protozoa-like dots are visible in the cavities representing former cells. (Periodic-acid-Schiff × 400.)
numbers of Toxoplasma. The other two mice remained apparently healthy during a period of observation of one month.

The thickened tendon sheaths obtained at the same operation were also examined histologically. In all the preparations granulation tissue was seen with round-cell infiltration and extensive areas of necrosis. The granulation tissue itself was surrounded by and contained fibrin in many places (Fig. 4). Characteristic swollen histiocytes, singly or in groups, were found mainly in the necrotic areas. In the cytoplasm of these cells corpuscles 1 to 2 μ in size could be observed under high power (Fig. 5). The cytoplasm of the cells was frequently seen to form pseudocysts (Fig. 6). The corpuscles always appeared intracellularly, were related to death of the cells, and formed the pseudocysts morphologically corresponding to Toxoplasma gondii (Fig. 7). They were deep purple in colour after the periodic-acid-Schiff (PAS) reaction, i.e., they were PAS positive, and in sections stained with toluidine blue they had a vivid blue colour. The necrosis of the matrix, the formation of fibrin deposits and the development of large masses of granulation tissue could also have been due to toxoplasmic inflammation.

Case 2—A housewife aged fifty-two, previously a builder of tile-stoves, had been treated for some ten years for swelling and occasional pain in both wrists, worse after exercise. Previous treatment of various kinds had had no significant effect. Moderate swelling was present over the flexor compartment of both wrists, on the right side extending to the thenar and hypothenar regions (Fig. 8). The power

![Image](image-url)

**Fig. 7**
Case 1—A high power view revealing the intracellular location of the parasites and a group formation of parasite-containing cells and pseudocysts of cellular origin. (Periodic-acid-Schiff x 650.)

**Fig. 8**
Case 2. Figure 8—To show the swelling of the right palm and ulnar side of both wrists.

**Fig. 9**
Figure 9—A radiograph showing an ovoid cyst in the right capitate, similar in appearance to those seen in Case 1 in the medial malleolus, talus and calcaneus.
of grip of both hands was normal. Radiographs of both wrists and hands revealed only a small cyst with a sharp and slightly sclerotic outline in the right capitate bone (Fig. 9).

The laboratory findings were as follows: ESR 12 millimetres/1 hour, and AST 480 IU. Further investigations, including the blood count, examination of the urine, liver function tests, and the latex test, were negative. The Toxoplasma antibody reaction as previously described was positive in January 1975 at a dilution of 1 : 20 and in November 1975 at 1 : 40.

Surgical treatment was refused by the patient, but the same course of medical treatment as in Case 1 was given and led to a remarkable decrease of the swellings and to improvement of the symptoms. The course was not repeated.

**Comment**

Polytenosynovitis of unknown aetiology is by no means rare in rheumatological practice. In our two cases the bilateral tenosynovitis at the wrists and ankles made us suspect a generalised disease, and the serological, microbiological and histological studies of the first case led to a firm diagnosis of toxoplasmosis. The medical and surgical treatment given to the first patient and the medical treatment only of the second patient led to marked amelioration of the symptoms and signs and proved very satisfactory.

**REFERENCES**


