4 years after the accident the patient has function with a plantar flexion of 25° and a dorsal flexion of 5° on both sides.

Follow-up radiographs revealed calcification of the periosteal flap (Figure 2). Stress radiographs showed no difference in lateral stability between both ankles.

Discussion

Many authors report a major stabilizing role of the lateral ligaments, most importantly for the anterior tibio-fibular ligament (Lauge Hansen 1950, Weber 1966, Yde and Kristensen 1980, Ent 1984, Hawe et al. 1989, Broos and Bisschop 1991, Michelson et al. 1992, Ryd and Bengtson 1992). However, these are all studies of inversion-supination traumata, where there is always disruption of the anterior and posterior articular capsule due to the talar tilt. Rasmussen (1985) stated that, if the other ligaments are intact, the tibiofibular syndesmosis and the lateral ligaments play only a minor role in lateral stability of the ankle. In our cases, the lateral ligaments and the syndesmosis were absent or insufficient because of the trauma, yet the stability of the ankle was good. Moreover, considerable fibrosis developed at the site of the absent lateral malleolus and soft tissue, but it did not restrict mobility; the stability must have been brought about by the intact anterior and posterior articular capsule and the intact deltoid ligament.

Capanna et al. (1986) excised the lateral malleolus in 11 patients for a bone tumor. Reconstruction was performed by intertibiofibular arthrodesis, cortical grafting or suturing of the peroneal tendons to the lateral side of the tibia. Although in these cases the lateral part of the ankle was surgically removed, including most of the ligamentous structures, the function and stability remained satisfactory.

References

Bongers K J. Een stabiele enkel zonder distale fibula. Ned Tijdschr Traum 1995; 1: 21-2.

Broos P L, Bisschop A P. Operative treatment of ankle fractures in adults: correlation between types of fracture and final results. Injury 1991; 22 (5): 403-6.

Capanna R, van Horn J R, Biagini R, Ruggieri P, Bettelli G, Campanacci M. Reconstruction after resection of the distal fibula for bone tumor. Acta Orthop Scand 1986; 57: 290-4.

Ent F W C van der. Lateral ankle ligament injury. Thesis, Drukkerij Ellinkwijk B.V. Utrecht, The Netherlands 1984.

Hawe W, Lippert M J, Bernett P. Functional anatomy of the upper ankle joint. Sportverletz-Sportschaden 1989; 3 (1): 1-5.

Lauge Hansen N. Fractures of the ankle. II. Combined experimental-surgical and experimental-roentgenologic investigations. Arch Surg 1950: 60; 957-85.

Michelson J D, Magid D, Ney D R, Fischman E K. Examination of the pathologic anatomy of ankle fractures. J Trauma 1992; 32 (1): 65-70.

Rasmussen O. Stability of the ankle joint: analysis of the function and traumatology of the ankle ligaments. Acta Orthop Scand (Supp 211) 1985; 56.

Ryd L, Bengtson S. Isolated fracture of the lateral malleolus requires no treatment. 49 prospective cases of supination-eversion Type II ankle fractures. Acta Orthop Scand 1992; 63 (4): 443-6.

Weber B G. Die Verletzungen des oberen Sprunggelenkes. Akt Probl in der Chir 3. Verlag Hans Huber Bern 1966.

Yde J, Kristensen K D. Ankle fractures: Supination-eversion fractures of stage IV. Primary and late results of operative and non-operative treatment. Acta Orthop Scand 1980; 51: 981-90.

Flexion contracture of fingers due to sarcoidosis—a case report

Kazuo Ikeda[1], Michio Saito[2], Yasunobu Sueyoshi[2], Hisayoshi Ichizen[2] and Katsuro Tomita[1]

Departments of Orthopaedic Surgery, [1]School of Medicine, Kanazawa University, 13-1 Takaramachi, Kanazawa, 920 Japan. Tel +81 762-62 8151 (ext. 3522). Fax -34 4261. e-mail seikei@kenroku.ipc.kanazawa-u.ac.jp, [2]Kanazawa National Hospital

Submitted 96-06-25. Accepted 96-09-16

A 63-year-old woman with sarcoidosis complained of a progressive painless flexion contracture of the right hand and foot since 1991. The flexor muscles of the right proximal forearm were indurated and the flexion deformity of the hand interfered with daily activities (Figure 1). The right proximal forearm was surgically explored. The flexor digitorum superficialis, profundus, and flexor carpi radialis and ulnaris were invaded by several yellowish-brown, firm elastic granulomas. There were also white thick firm stripes, approxi-

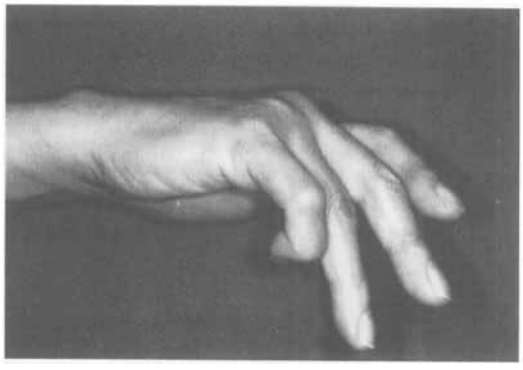


Figure 1. Preoperative view of the affected right hand.

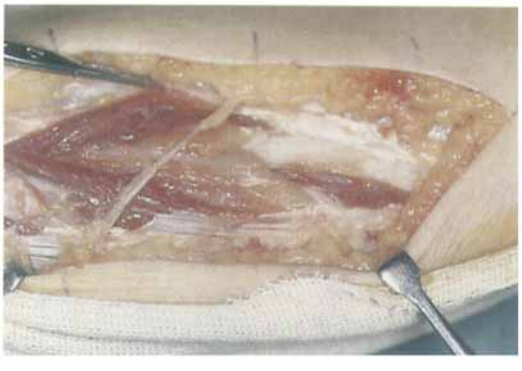
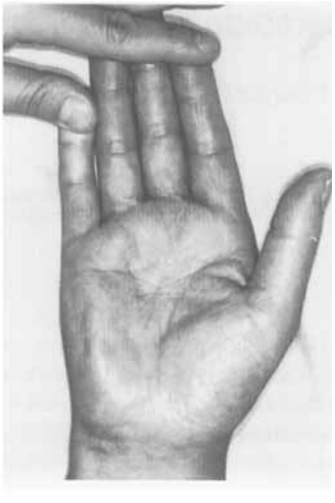


Figure 2. Intraoperative findings. There are granulomas (*) and a white stripe (arrow) in the proximal forearm muscles, which cause a flexion contracture of the fingers.

mately 8 mm wide in the muscles (Figure 2). These lesions became tight when the wrist was passively extended. We resected part of the granulomas as well as the white stripes, which restored passive extension of the fingers. Histopathology showed a typical sarcoid with tubercles. The tubercles consisted of Langhans' giant cells and epithelioid cells. Half a year after surgery, she could use the hand without discomfort, despite a persistent mild contracture (Figure 3).

Discussion

Although granulomatous involvement of skeletal muscle occurs in more than half of the patients with sarcoidosis, almost all of them are asymptomatic (Baydur et al. 1993). Silverstein and Siltzbach (1969) classified sarcoidosis as 1) asymptomatic, 2) symp-



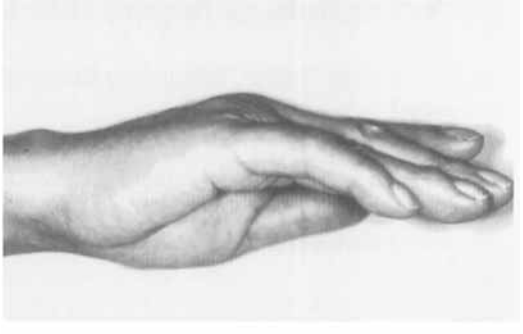


Figure 3. Postoperative view of the right hand.

tomatic a) palpable muscle nodules, b) acute myositis, c) chronic myopathy. Symptomatic muscle involvement, such as palpable muscle nodules and myopathy with muscle weakness, atrophy, and pain, are rare. A case of the nodular type of muscular sarcoidosis, with limitation of mandibular opening, was reported by Hitsuda et al. (1994). Simmonds and Hoffbrand (1990) have reported 2 cases with granulomatous muscle disease and flexion contractures of the limbs, but with no evidence of systemic sarcoidosis. 1 case had involvement of the long finger flexors of both hands and the other case of the ring finger flexor of the right hand. Warburg (1955) and Ueba and Obara (1974) have reported 2 other cases of contracture of fingers due to sarcoidosis affecting both hands. Muscle contracture due to sarcoidosis is rare, but can successfully be treated with surgical excision.

References

Baydur A, Pandya K, Sharma O P, Kanel G C, Carlson M. Control of ventilation, respiratory muscle strength, and granulomatous involvement of skeletal muscle in patients with sarcoidosis. Chest 1993; 103 (2): 396-402.

Hitsuda Y, Igishi T, Kawasaki Y, Hori S, Yamamoto Y, Sasaki T. A case of nodular type of muscular sarcoidosis with limitation of mandibular opening (Japanese). Nippon Kyobu Shikkan Gakkai Zasshi 1994; 32 (3): 266-70.

Silverstein A, Siltzbach L E. Muscle involvement in sarcoidosis. Arch Neurol 1969; 21: 235-41.

Simmonds N J, Hoffbrand B I. Contracturing granulomatous myositis: a separate entity. J Neurol Neurosurg Psychiatry 1990; 53 (11): 998-1000.

Ueba Y, Obara A. Sarcoidosis manifested by gradual flexion contracture of fingers. The Hand 1974; 6 (1): 91-4.

Warburg M. A case of symmetrical muscular contractures due to sarcoidosis. J Neuropathol Exp Neurol 1955; 14: 313-5.