

the cervix was dilated three fingerbreadths, and the patient was tired and distressed. At 2 p.m. the cervix was fully dilated and the membranes were ruptured artificially, whereupon she started to bear down vigorously. At 3.45 p.m. the head was on the perineum and the patient was still bearing down extremely vigorously with little progress. At 4.45 p.m. the soft tissues of the introitus were noted to be small, tight, and unyielding. The perineum was infiltrated with 20 ml. of 1% procaine hydrochloride and a wide right medio-lateral episiotomy was performed. At 4.50 p.m. she complained of a pain in the right chest. At 5.5 p.m. she was delivered spontaneously of a vigorous 6½-lb. (2,950-g.) male infant. At 5.10 p.m. a slight swelling of the right side of the face was noted. The placenta and membranes were delivered intact by fundal pressure at 5.30 p.m.

On November 26 a gross crepitant swelling of the face, especially in the periorbital regions, and more marked on the right side, was observed. This crepitant swelling extended into the right supraclavicular fossa, both infraclavicular fossae, and the entire upper anterior chest, again most marked on the right side. Pitting oedema of the right arm, forearm, and hand of non-crepitant type was noted. The patient was not cyanosed and did not complain of cough, dyspnoea, or dysphagia. Her temperature was 98° F. (36.7° C.), and pulse 88.

A diagnosis of subcutaneous emphysema was made. Clinical examination of the chest revealed symmetrical expansion. The percussion note was normally resonant, and cardiac and hepatic areas of dullness were elicited. The breath sounds were vesicular throughout and no adventitious were detected in any zone.

During the next 48 hours the crepitant swelling became more marked. No symptoms were elicited apart from a diminishing non-pleuritic type pain in the right chest. The patient was, however, much distressed by her bizarre and grotesque facial appearance.

Her pulse and temperature were recorded twice daily for the next 12 days. The pulse varied between 84 and 92 for the first seven days of the puerperium, settling to 74 by the tenth day. The maximum recorded temperature was 98.6° F. (37° C.) on the evening of the third day.

By the tenth day no subcutaneous crepitation could be elicited in any zone, and the pitting oedema of the right arm had resolved.

I wish to thank Miss M. A. Ridgley for her interest in the case and Dr. W. H. Callander for confirming the clinical signs.

J. LLEWELLYN SKINNER, M.B., D.Obst.R.C.O.G.,
General Practitioner, Ilkeston, Derbyshire.

REFERENCES

- Charbonnet, P. N. (1925). *Surg. Gynec. Obstet.*, 40, 105.
Faust, R. C. (1940). *Northw. Med. (Seattle)*, 39, 24.
Reckitt, J. D. T. (1922). *Lancet*, 1, 843.
Roth, D. B. (1943). *Amer. J. Obstet. Gynec.*, 46, 730.
Simmons, S. F. (1784). *Med. Commun. (Lond.)*, 1, 176.
Watson, D. (1885). *British Medical Journal*, 2, 699.
Wiland, O. K., and Crowder, R. E. (1951). *Amer. J. Obstet. Gynec.*, 62, 1370.

Avulsion and Rupture of the Tendo Calcaneus after Injection of Hydrocortisone

A cross-country runner aged 33 had been suffering from gradually increasing pain about the insertion of the tendo calcaneus for over nine months when he first sought advice on April 23, 1955. He had done no running for some months. There was no swelling of the tendon or round it, but there was tenderness in front of the upper part of its insertion, which seemed consistent with a diagnosis of chronic tendo calcaneus bursitis.

As it continued to get worse, on May 14 hydrocortisone acetate (25 mg. in suspension in 1 ml.) was injected into the painful region. This was followed by some relief of pain, and further injections were given on June 11 and July 9. On each of these occasions 50 mg. was injected, half on each side of the tendon. A little of the fluid was seen to run up in the paratenon on the second occasion, but when the point of the needle was in actual tendon tissue no fluid could be forced in.

After the third injection he felt complete relief and resumed training without apparent ill effect. On July 30, while running gently on smooth ground, he felt the tendon tear suddenly, but had no pain, and he limped home. There was an obvious gap, and the tendon was operated upon the next day.

Findings at Operation.—The superficial part of the tendon was found to be avulsed from the calcaneum. The deep part was ruptured about 1½ in. (3.8 cm.) above the heel, and a longitudinal split joined the two lesions. The avulsed part resembled a cast of the posterior surface of the calcaneum. Its lower margin was smooth and sharply defined, and it was drawn up and tucked into the gap in the deep part. There had been very little bleeding, and there was no scarring or other evidence of past or present inflammation. The tear in the deep part was obviously recent and a little frayed.

As a transverse incision above shoe level had been used, it was not possible to inspect the bursa or the back of the calcaneum effectively even by curving the incision downwards. Repair was carried out with stainless steel mattress sutures, the deep and superficial parts being overlapped and stitched together. No attempt was made to suture the avulsed part direct to the calcaneum, but it was tucked into position.

A short walking-plaster was continued for 7½ weeks, after which normal use was encouraged. Three months after the operation the lower part of the tendon was still much thickened, but not tender or painful, and the patient resumed cross-country running.

COMMENT

Whatever caused the original pain, it had been unchanged in character for about nine months. Chronic pain and swelling in the tendo calcaneus are common in long-distance runners, who usually recover in a few months whether they continue to run or not. Pain about the insertion is much less common, and is usually ascribed to calcaneal bursitis. It is aggravated by running and forces the sufferer to stop. If this patient's pain was due to bursitis it may have been secondary to a lesion of the tendon at its insertion. There was, however, at no time any pain or swelling at the back of the calcaneum.

The unusual nature of the avulsion leads to a suspicion that the final phase was influenced by the injections. The suspension may have been injected into a space, actual or potential, between the superficial and deep layers of the tendon, and absorbed slowly because of the relatively avascular nature of the tissue. Gonzalez (1953b) reported that remnants of the drug were still present in the tissues three weeks after it had been introduced at operation.

Avulsion appears to have been going on for some time. Simultaneous repair may have been hindered by the hydrocortisone. Experimental evidence of its effects on tendon healing is rather conflicting. Gonzalez (1953a) reported that local hydrocortisone did not affect repair of cut tendon sutured at a distance. Carstam (1953) stated that the tensile strength of repairs in dogs was not affected if firm apposition was maintained, but if apposition failed the repair was weaker than in controls. Berkin (1955) confirmed that neither cortisone nor hydrocortisone affected tendon union. Strict comparison with experiments in small animals may be vitiated by a slow rate of absorption in such a large tendon.

Progressive weakening of the attachment of the superficial part of the tendon would evidently increase the strain on the deep part, which would rupture under a stress insufficient to injure a normal tendon.

H. B. LEE, M.B., F.R.C.S.,
Orthopaedic Surgeon,
Alexandra Hospital for Children with Hip Disease, Luton.

REFERENCES

- Berkin, C. R. (1955). *Proc. roy. Soc. Med.*, 48, 610.
Carstam, N. (1953). *Acta chir. scand.*, Suppl. 182, 85.
Gonzalez, R. I. (1953a). *J. Bone Jt Surg.*, 35A, 525.
— (1953b). *Ibid.*, 35A, 991.