PARTIAL RUPTURE OF THE TENDO CALCANEUS WITH HETEROTOPIC OSSIFICATION

Report of a Case


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A woman of forty-seven complained that during the previous three months a painful swelling had developed above the right heel. She had always been healthy and there was no history of injury.

On examination the patient walked with a limp, but despite discomfort could stand on the toes of the right foot. The area above the calcaneus was diffusely swollen, with an imprecisely definable mass lying subcutaneously and attached to the calcaneal tendon. There was a full range of ankle movement. Squeezing the calf produced plantar-flexion of the foot. Radiographs showed ossification subcutaneously in line with the calcaneal tendon (Fig. 1).

On investigation the haemoglobin was 13.4 grammes per cent, the white blood count was 7,000 per cubic millimetre and the sedimentation rate was 7 millimetres in the first hour (Westergren).

Operation—The mass was explored through an incision lateral to the calcaneal tendon. It measured five by two centimetres and was seen to be entirely confined to the tendon two centimetres above its insertion into the calcaneus. The superficial fibres of the tendon were split in the line of the skin incision to reveal a central haematoma and a partial rupture of the deep fibres of the tendon. The ossified parts could be palpated in relation to the tear and were excised, leaving the superficial fibres in continuity.

Pathology—A soft-tissue radiograph of the mass showed areas of ossification (Fig. 2). When it was cut in the coronal plane a complete rupture of the fibres was seen (Fig. 3). Histological examination showed that the area of rupture was surrounded by haemorrhage and granulation.
tissue with actively proliferating fibroblasts. In other areas the tendon was poorly cellular, with amorphous deposits of calcium salts related to areas showing a fibrinoid appearance (Fig. 4). Finally there were ossicles within the tendon. These consisted of trabeculae of lamellar bone with a predominantly fatty “marrow” tissue (Fig. 5). Around most of the periphery of the ossicles there was immature bone and some cartilage resembling post-traumatic subperiosteal reaction (Fig. 6).

Fig. 4
Poorly cellular tendon with irregular areas of amorphous calcification. Fibrinoid change occupies the adjacent area. (Haematoxylin and eosin, \( \times 70 \).)

Fig. 5
Figure 5—Centre of intratendinous ossicle. The trabeculae are composed of lamellar bone and the intertrabecular tissue is predominantly fatty. (Haematoxylin and eosin, \( \times 70 \).) Figure 6—Periphery of intratendinous ossicle. Immature bone and cartilage. (Haematoxylin and eosin, \( \times 70 \).)
DISCUSSION

Although true heterotopic ossification has been described in the tendo calcaneus (Brumbaugh 1932, Watson Jones 1932, Watson Jones and Roberts 1934, Luck 1950), only Mallinson (1932) has described its association with rupture of the tendon. The incidence of ossification within the tendon is unknown, because bone formation in itself does not cause symptoms. In the present case the mature appearance of so many of the ossicles suggests that their existence antedated the onset of symptoms.

What induces osseous metaplasia in tendon is also unknown. In some of the previously reported cases (Mallinson 1932, Watson Jones 1932, Watson Jones and Roberts 1934, Luck 1950) subcutaneous tenotomy had been carried out some years before ossification appeared. It is a common observation that dystrophic calcification in a variety of tissues is followed by ossification. Both dystrophic calcification and ossification were present in the tendon of our patient, although these changes were not closely related in the histological preparations. It is possible that ossification had replaced previously calcified tissue. Calcification is probably a consequence of “degenerative” changes in collagen, the etiology of which is not known but may be related to vascular insufficiency.

The relationship between ossification and rupture appears to differ in previously reported cases; Mallinson believed that fracture through the ossicle was part of the process of disruption, whereas Watson Jones considered that rupture occurred between two ossicles of independent origin. Rupture in the present case appears to have occurred in non-ossified tendon, although the very active bone and cartilage at the periphery of the ossicles indicates that the periosteum had been recently elevated. Our findings confirm Watson-Jones’s opinion that ossification can occur at more than one focus.

SUMMARY

1. A case of ossification and partial rupture of the tendo calcaneus is reported.
2. The possible etiology of the ossification and its relationship to the rupture is discussed.

REFERENCES