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CT scans reveal the full extent of bone and joint damage of the Charcot foot

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Diagnosis and monitoring of the mid-foot Charcot osteoarthropathy is difficult. The aim of this study was to assess the full extent of bone and joint damage as revealed by a CT scan, in addition to that shown on the foot x-rays. We studied 20 diabetic patients who presented clinically with acute Charcot osteoarthropathy, as indicated by a hot swollen foot and a skin foot temperature difference of greater than 2°C compared with the contralateral foot. Foot and ankle X-rays and CT scan were carried out at presentation and then were repeated at the time of clinical resolution as indicated by a foot skin temperature difference of less than 2°C. At presentation, CT revealed fractures in 15 patients of whom only 4 were also seen on X-ray. Thus CT revealed 11 further fractures which were in the metatarsal/tarsal joints in 5 patients, bases of the metatarsals in 5 patients and navicular/cuneiform joint in 1 patient. CT scans also showed the presence of multiple bony fragments in 14 patients. These were not seen on the foot X-ray. Sites of intra-articular fragmentation included tarsal/metatarsal joints (8) and talo-navicular joints (2) and the navicular bone was fragmented in 2 cases. Subchondral cysts were seen in 6 patients on CT: in the tarsal/metatarsal joints (3) and in the navicular bone (3). The CT scans also revealed the full extent of subluxation/dislocation on the 3D reconstruction views including tarsal/metatarsal dislocation (14) and also subluxation in the talo-navicular joint (2) and calcaneo-cuboid joint (1). The repeat CT scans that were carried out at the time of clinical resolution revealed evidence of fracture healing in 6 out of the 11 patients in whom fractures were seen on CT at presentation. However, in the remaining 5 cases which did not show fracture healing, total contact casting was extended even though the difference of the foot skin temperature was less than 2°C compared to the contralateral foot. We conclude that the CT scan should be carried at presentation of acute Charcot osteoarthropathy as it can reveal the full extent of bone and joint damage including fractures, subchondral cysts and bony fragmentation which may be not present on X-rays. The CT scan should be also carried out at the time of clinical resolution to assess fracture healing. One final advantage of the CT scan of the foot and ankle is that it can be carried out without using intravenous contrast and thus it was possible to perform this investigation in all 20 patients in this study, even though 10 had impaired renal function.