

What Is It?

Charcot arthropathy, also known as Charcot foot and ankle, is a syndrome in patients who have neuropathy or loss of sensation. It includes fractures and dislocations of bones and joints that occur with minimal or no known trauma.

Symptoms And Clinical Presentation

Initially, there may be swelling, redness and increased warmth of the foot and ankle. Later, when fractures and dislocations occur, there may be severe deformities of the foot and ankle, including collapse of the midfoot arch (often called rocker bottom foot) or instability of the ankle and hindfoot. The syndrome progresses through three general stages:

Stage 1 (acute, development-fragmentation): marked redness, swelling, warmth; early radiographs show soft tissue swelling, and bony fragmentation and joint dislocation may be noted several weeks after onset.

Stage 2 (subacute, coalescence): decreased redness, swelling and warmth; radiographs show early bony healing.

Stage 3 (chronic, reconstruction-consolidation): redness, swelling, warmth resolved; bony healing or nonunion and residual deformity are frequently present.

Cause (Including Risk Factors)

Charcot foot occurs in patients with peripheral neuropathy resulting from diverse conditions including diabetes mellitus, leprosy, syphilis, poliomyelitis, chronic alcoholism or syringomyelia. Repetitive microtrauma that exceeds the rate of healing may cause fractures and dislocations. Changes in circulation may cause resorption of bone, weakening the bone and increasing susceptibility to fracture and dislocation.

Anatomy

Charcot arthropathy may affect any part of the foot and ankle, including (in decreasing order of frequency) the midfoot, hindfoot, ankle, heel and forefoot. Multiple regions may be involved concurrently. Fractures and dislocations frequently involve several bones and joints, with extensive fragmentation and deformity.

Diagnosis

Time between onset of symptoms and diagnosis may be several weeks or months. Delay in diagnosis may or may not affect the end result because gross instability may occur even if prompt diagnosis is made. Diagnosis is based on a high index of suspicion for this problem in patients with neuropathy. Increased redness, swelling and warmth may be the only early signs. Some patients have pain. Early radiographs may show soft tissue swelling with no bony changes, but repeat radiographs several weeks later may show bone and joint changes.

Treatment Options

Non-Surgical: Non-operative treatment includes a protective splint, walking brace, orthosis or cast. Early weightbearing is allowed in stage 1 by 41 percent of specialists and in stage 2 by 49 percent of specialists, and other specialists recommend non-weightbearing. After stable healing is noted in stage 3, treatment includes accommodative footwear with protective orthoses.

Surgical: Selected patients with instability in the early stages may be treated with open reduction and internal fixation and fusion. In the later stages, surgical options may include realignment osteotomy and fusion (correction of deformity) or ostectomy (removal of bony prominence that could cause an ulcer).

Recovery

Healing may require several months. Healing times after surgery may be twice the usual duration than for a non-diabetic foot. With Charcot foot and ankle, healing after fusion may require six months of protection and subsequent orthoses.

Outcome

Charcot foot and ankle may recur or flare up. Furthermore, bilateral involvement is common. Therefore, impairment with this condition is permanent. Patients use protective footwear and orthoses, and limit standing and walking to that required for activities of daily living. Regular lifelong follow-up is required with a specialist.

Complications

Severe deformities may include collapse of the midfoot arch (called rocker bottom foot) with associated plantar midfoot ulcer. Deformities may occur in any part of the foot and ankle and result in ulcers from bony pressure against the shoe or ground; ulcers may become infected, and infections may be limb- and life-threatening. Some Charcot joints, such as the ankle, may heal with fibrous tissue (non-union) and this may result in gross instability (“floppy foot”) that may predispose to ulcers and may be difficult to support with braces.

Frequently Asked Questions

Why is it common for there to be a delay between onset of signs and diagnosis of Charcot foot?

The initial signs of Charcot foot are non-specific and are more typically seen in other more common conditions such as infections and rheumatologic conditions. Many patients do not have pain or have pain from neuropathy that was preexisting. Physicians who are not specialists in orthopaedic foot and ankle problems may see a Charcot foot very few times in an entire career, less frequently than other conditions such as septic arthritis, gout, rheumatoid arthritis and other inflammatory arthropathies.

Does a delay between onset of signs and diagnosis worsen the prognosis?

Not necessarily. Some cases of Charcot arthropathy become unstable in the very early stages and have destabilized before the patient sees the doctor. Other cases may destabilize even if the foot and ankle are optimally protected early in the course of the problem. Early protection may help decrease risk of further instability in some patients, but instability might occur despite early protection. The massive bony fragmentation may cause instability very differently than a fracture resulting from trauma in a non-neuropathic patient.