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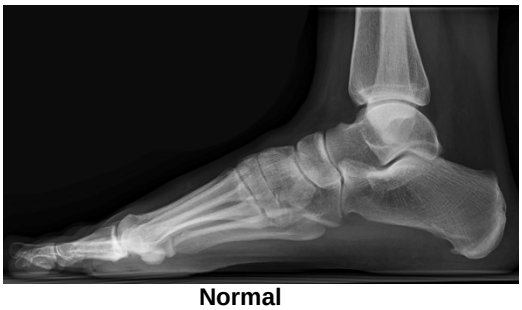
Charcot Neuroarthropathy
(Neuropathic Arthropathy)

Charcot neuroarthropathy is a destructive process in which the bones and joints of the foot or ankle become unstable, resulting in deformity. This occurs in patients with abnormal sensation, most commonly associated with diabetic peripheral neuropathy but can also be associated with chronic inflammatory disorders, gout, metabolic dysfunction, idiopathic, as well as autonomic, or hereditary peripheral neuropathy, or abnormal sensation from spine disorders or chronic alcohol abuse/consumption. Abnormal sensation can result in repetitive micro-trauma to the foot & ankle that is frequently not realized by the patient. This can result in joint collapse or even fracture due to increased stresses across the joints. Associated with this is increased blood flow to the involved area that can result in further bone and joint destruction.

Normal

Charcot



Normal

Charcot

Signs and Symptoms

There are three phases of Charcot neuroarthropathy, acute (destructive), sub-acute (reparative), and chronic (stabilized). The entire process can take 6-12 months to resolve. In the acute phase, the foot and ankle exhibits significant swelling, erythema (redness), and warmth. It may be painful but frequently isn't. It is often confused with infection or gout. Radiographs may show destructive joint changes or even fracture. Diagnosis and early treatment at this stage is important to try to minimize the bone destruction and deformity.

acute Charcot

acute Charcot

The second phase (sub-acute, reparative) involves slow, gradual resolution of the redness, warmth, and swelling as the body attempts to heal the bony destruction. Radiographs will stabilize with evidence of bony repair. The third phase (chronic, stabilized) represents a healed process with lack of redness, warmth and swelling. Bony repair is noted and the joints stabilize. Deformity may be present.

Treatment

Successful treatment of Charcot neuroarthropathy requires prompt diagnosis and immobilization until the bony and joint destruction has stabilized. This may require serial casting and protected or non-weightbearing for 4-6 months. In the acute phase, it is imperative to seek immediate treatment, which will require casting and non-weightbearing until the redness, warmth, and swelling start to resolve and radiographs show signs of bony healing. This will require frequent cast changes and strict non-weightbearing.

Once healing begins (sub-acute phase), gradual weightbearing is allowed in a cast or boot brace. It may take several months to be able to ambulate without a walker, crutches, or wheel chair. In the resolved phase, the Charcot process has stabilized and it is necessary to protect the foot and ankle with a protective insert (orthotic) or brace. This protects any bony prominence and provides stability to the foot and ankle.

stabilized Charcot deformity

Bracing and orthotic selection is based on the severity of the deformity. Here a few example of orthotics and braces commonly used for Charcot patients.

Trilaminated accommodative orthotic

UCBL

AFO

Double upright calf lacer

CROW

If the resultant deformity is not shoeable or braceable or if there is continued inflammation or collapse into the sub-acute (reparative phase), surgery may be considered. Additionally, some chronic Charcot deformities are not amendable to bracing, or the resultant bony deformity may create ulcers that require surgery. The timing for this surgery is important. Surgery done during the inflammatory stage may have a high complication rate. However, sometimes surgery must be done during this stage due to joint instability. Reconstructive surgery for Charcot Neuroarthropathy is a high risk procedure and does not alleviate the need for bracing post-operatively.

Chronic management of patients with Charcot neuroarthropathy is important. Once a patient is stable, periodic checkups (six to twelve month intervals) is important to address footwear, orthotic and brace issues, and continue patient education regarding the care of neuropathic feet.

It is imperative that patients seek care if they develop any recurrent redness, swelling, or warmth in the foot or ankle, as this could indicate a new Charcot process. Daily foot checks are highly recommended to evaluate for signs of a recurrent Charcot process or ulceration. Patients should always inspect both feet as patients with Charcot have a higher risk of developing Charcot on the other side.

Charcot Do's & Don'ts

- Do protect your feet with an orthotic or padded slipper
- Do perform daily inspection of your feet
- Do Maintain good glucose control
- Do receive regular corn, callous, nail care
- Do report any redness, warmth, or swelling
- Don't walk in bare feet
- Don't ignore early ulcers, infections (or) redness, warmth, swelling of the feet