CHARCOT’S JOINT

Charcot’s joint is a complication that can affect people with diabetic neuropathy (nerve damage). The condition, also known as neuropathic arthropathy, was first described by French physician Jean Martin Charcot in 1868. It wasn’t until 1936 that the condition was linked to diabetes.

“Neuropathic” implies that something is disrupting the flow of messages through the nervous system. “Arthropathy” refers to any disease process affecting a joint of the body. Simply put, neuropathic arthropathy means a progressive degeneration of single or multiple joints caused by an underlying neurological problem. In people with diabetes, the underlying problem is diabetes-related nerve damage. Although Charcot’s joint can affect different joints of the body, for those with diabetes, the foot is most commonly affected.

Charcot’s joint is not an uncommon complication of diabetes. Cases may be underreported because the disease is easy to misdiagnose. Most often, the disease develops in people between the ages of 40 and 60. Younger people, however, might be affected. It usually occurs in those who have had diabetes for at least 10 years and who have diabetic neuropathy.

Diabetic neuropathy may affect the autonomic (involuntary) nervous system. The autonomic nervous system controls such body functions as regulation of blood vessels and sweat glands. With autonomic neuropathy, there may be decreased sweating of the feet, causing increased callus formation and dry, cracked skin. The loss of blood-vessel regulation may lead to an increase in blood-vessel diameter and an increase in blood flow. Increased blood flow may contribute to swelling and strong pulses in the foot, as well as to osteoporosis, or thinning of the bones, of the degenerating joint.

**Symptoms of Charcot’s Joint**

Although the symptoms of Charcot’s joint vary, here is how a typical case might occur. A person may seek medical care for a very swollen foot. There may have been an injury, such as a twisted ankle, but the foot is much more swollen than one would expect. Despite the swelling, there is relatively little pain. This lack of feeling in the foot is related to the degree of diabetic neuropathy present.

The foot looks red and feels warm to the touch. This may lead the patient or the doctor to suspect an infection, especially if the foot has an underlying diabetic ulcer.

With Charcot’s joint there is dislocation and deformity of the involved joint. As a result, the foot looks flat-footed, the normal arch is collapsed, and there is a complete loss of normal bone structure in the foot. With the loss of joint stability, there can also be a loss of normal gait. This may lead to ulcer formation and infection. Fitting shoes over this type of foot deformity is extremely difficult.
How Charcot’s Joint Develops

How does Charcot’s joint happen? Most researchers agree that it results from injury to joints that have lost the sensation of pain. Diabetes-related nerve damage can lead to insensitive feet and also to a loss of the ability to determine the relative position of a body part. There can also be a loss of reflexes to muscle supporting the foot joints, causing them to be unstable.

Walking on the degenerating joint can cause it to become even more unstable. Lacking the support of ligaments, the joint surfaces begin to grind on nearby bone. This joint destruction results in inflammation, which in turn leads to the softening of the remaining bone. The result: more instability and dislocation. Ultimately, the process can lead to a classic Charcot’s joint—one in which the bone structure of the foot has collapsed.

Because Charcot’s joint is a complication of diabetic neuropathy, recognizing the symptoms of neuropathy is important to help identify who may be at risk for developing Charcot’s joint disease. Symptoms of diabetic neuropathy include:

- numbness
- burning or shooting pain
- loss of ability to feel heat or cold
- decreased vibration sense
- decreased sense of joint position
- small muscle wasting in feet
- decreased sweating in feet
- callus formation over weight-bearing areas
- decreased ankle reflexes

Usually, the physician will confirm the diagnosis of Charcot’s joint with an x-ray examination. Early x-ray changes show degeneration similar to that of osteoarthritis. By the time the symptoms of redness and swelling develop, x-rays may suggest bone infection or osteomyelitis (infection of the bone marrow or bone structure). If there are open cuts or ulcers on the foot, these can also become infected. Modern diagnostic tests, such as bone scans, can help the doctor distinguish between osteomyelitis and Charcot’s joints.

Treatment of Charcot’s Joint

There are three major stages to Charcot’s joint disease. In the first stage, as the disease develops, the bone is destroyed. It is during this stage that the symptoms mentioned earlier (swelling, redness, heat, strong pulse, insensitivity of foot) appear. Diagnosis during this stage is important. Prompt treatment can help limit bone destruction and aid healing.

The second stage is called coalescence. During this stage, bone destruction slows down, and, at the same time, the healing process begins. At this point, the arch of the foot is becoming nonexistent.

The third stage is reconstruction. The foot is healing, but as a result of bone destruction and structural changes, it is healing into a deformed foot.
Treatment of Charcot's joint attempts to prevent joint damage by immobilizing the involved joint and avoiding weight-bearing activities during the early stage of healing. Any pressure on the injured joint during the first (or developmental) stage will cause further joint dislocation and bone destruction. The foot is usually put in a cast to preserve joint function and minimize the damage. Casts must be applied carefully because further damage to a neuropathic foot by an improperly applied cast can be devastating. In less severe cases, less rigid immobilization may be adequate.

Usually immobilization continues until all the bone fragments are healed. This may take several months. During the reconstructive stage, prescription footwear is required. Prescription footwear and special orthoses (shoe inserts) are important to prevent the formation of ulcers over the bony areas that often form as the Charcot's joint fractures heal.

In some cases, reconstructive surgery may be necessary. Surgery would only be scheduled after complete healing of the deformed joint. Even if corrective surgery is not recommended, people suffering from Charcot's joint will need ongoing podiatric care. The foot is at greater risk of infection that could ultimately lead to amputation. Because Charcot's joint disease can be devastating, early prevention is important.