Chronic Total Occlusion of the Coronary Arteries

Coronary Artery Disease

Coronary artery disease (CAD) affects the arteries of the heart. (Figure 1). CAD occurs when the arteries become clogged with plaque. Plaque consists of fat, cholesterol, and calcium that collect in the arteries. As plaque builds up, the wall of the artery becomes rough, hard, and narrowed over time. This is known as atherosclerosis and decreases blood flow to the heart muscle. If the blood flow is decreased, the heart muscle does not get the oxygen and nutrients it needs to function at its best. This can cause damage to the heart muscle. CAD is the leading cause of death in the United States.

Figure 1: Coronary Arteries
Chronic Total Occlusion (CTO)

When the artery has been completely, 100% blocked for more than 3 months, it is called chronic total occlusion (CTO).

**Figure 2: Atherosclerosis**

Sometimes, when a coronary artery is completely blocked, smaller arteries in the heart detour blood around the blockage. These new arteries are called collateral arteries. They bring some, but not enough, blood flow to the affected area of the heart. So, a patient with CTO can still have symptoms of poor blood supply to the heart, such as:

- Shortness of breath
- Fatigue
- Angina with physical activity

The CTO plaque is often a very thick and hard blockage. These blockages may be difficult to treat with medications and other procedures. However, the Center for Coronary Disease at the Northwestern Bluhm Cardiovascular Institute offers advanced techniques to treat and ease symptoms of CTO.

**Treatment Options for Chronic Total Occlusion**

First, CTO is diagnosed by an angiogram. This shows the condition of the coronary arteries. Then, the CTO team will work with you to develop a plan to manage your CTO. The team includes doctors, nurses, and technicians.

Typically, the first step in this plan is to assess and adjust your medications to improve symptoms. If this fails, a Percutaneous Coronary Intervention (PCI) especially for CTO is often recommended.

PCI for CTO can successfully treat and ease symptoms. It can open blockages and increase blood flow to the heart. Unlike other PCIs in which a wire is passed through a narrow opening in the artery, a PCI for CTO passes the wires directly through or around the blockage, often using the collateral arteries that have been formed.
During the procedure, the doctor inserts a catheter into a blood vessel near the groin and/or wrist. The special wires or devices are then passed through the catheter to the blockage.

Once the wires are in place, a balloon is inflated to compress the plaque and open the artery, and a stent (small mesh tube) is added to help keep the artery open. This allows blood to flow normally to the heart.

**Benefits of Treatment**

PCI for CTO can be performed safely by our specially trained staff and the risk of complications is low. The procedure is minimally invasive and patients often return home the following day. Afterwards, the improved blood supply and heart function often result in a dramatic reduction of symptoms.

**Who Qualifies for Treatment?**

You may be a candidate for this treatment if you have the following:

- CTO with symptoms from the blocked artery **and**
- an abnormal stress test **and**
- continue to have symptoms despite medication therapy

**Contact Us**

For more information about treatment of Chronic Total Occlusion (CTO), please call the Bluhm Cardiovascular Institute at **312.NM.HEART (664.3278)**.

**Clinical Trials**

For more information regarding clinical trials related to coronary disease, please call **312.926.4000**.

**Northwestern Medicine – Health Information Resources**

For more information, contact Northwestern Memorial Hospital’s Alberto Culver Health Learning Center (HLC) at hlc@nm.org, or by calling 312.926.5465. You may also visit the HLC on the 3rd floor, Galter Pavilion at 251 E. Huron St., Chicago, IL. Health information professionals can help you find the information you need and provide you with personal support at no charge.

For more information about Northwestern Medicine, please visit our website at nm.org.