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Osteonecrosis

WHAT IS OSTEONECROSIS?

Osteonecrosis, also referred to as avascular necrosis, ischemic necrosis, or aseptic necrosis, literally means “dead bone” (osteo=bone, necrosis=dead). It most often refers to a form of arthritis in which one of the bones of a joint is affected by osteonecrosis, leading to arthritis in the joint. Osteonecrosis is the result of a decrease in blood supply to specific parts of bones. This decreased circulation causes cells in the bone and bone marrow to begin to die. Eventually the dead section of bone weakens and collapses.

WHAT CAUSES OSTEONECROSIS?

Injuries such as fractures or dislocations of certain bones can produce osteonecrosis if the arteries supplying blood to these areas are damaged. Blocked blood vessels, of any cause, will result in osteonecrosis. These may be caused by fat particles, abnormal red blood cells, sickle cell anemia or expanding nitrogen bubbles (commercial deep-sea divers or compressed-air [tunnel] workers who do not decompress properly). Taking glucocorticoid medications also

can reduce the bone blood flow by increasing fatty marrow and the formation of fatty substances (see *Figures 1 and 2*).



Figure 1 - Normal hip joint



Figure 2 - Hip joint showing the effects of osteonecrosis

WHO GETS OSTEONECROSIS?

The following people are most at risk for developing osteonecrosis:

- those with certain fractures of the hip;
- alcoholics;
- those taking large doses of steroids;
- individuals with sickle cell anemia, lupus or pancreatitis.

People between the ages of 30 and 50 are most likely to develop osteonecrosis of the hip, with men developing this condition slightly more frequently than women. Osteonecrosis of the knee occurs most often in women between ages 50 and 60 or much earlier in people who've also developed osteonecrosis of the hip and shoulder.

WHAT ARE THE SYMPTOMS?

In the earliest stage, there are usually no symptoms at all. However, as the condition progresses, pain becomes the primary symptom. Other symptoms include limitation of motion, joint stiffness and muscle spasms. Symptoms usually begin slowly. If the condition is left untreated, progressive bone damage (bone collapse) most likely will occur. Surgery may be required to correct this damage.

Pain

The initial pain of osteonecrosis usually is mild. The pain often becomes worse after standing, walking or performing some other weight-bearing activity. In later stages, pain can occur even when you're resting, and sometimes may awaken you from sleep.

Limitation of Motion

In the early stages, joint motion is not affected. However, pain may make it difficult to move the

affected joint. Eventually, if the bone collapses, the cartilage will be injured, resulting in arthritis with progressive limitation of joint motion.

HOW IS IT DIAGNOSED?

Early diagnosis of osteonecrosis is important in order to prevent the affected bone from collapsing. Information obtained from your medical history, along with the results of a thorough physical examination, can help identify this condition.

Diagnosis at this early stage is best made by *magnetic resonance imaging* (MRI). MRI is a technique that produces cross-sectional images of the body by exposure to magnetic energy sources (but without harmful radiation). MRI is able to detect osteonecrosis before significant damage to the bone has occurred and before changes on X-rays are evident.

If the diagnosis is not made soon enough and the condition is allowed to progress, inevitable damage to the bone will occur with involvement of the corresponding joint. At this point, osteonecrosis produces changes of the bone that can be detected on routine X-rays of the joint.

HOW IS OSTEONECROSIS TREATED?

Aspirin and other nonsteroidal anti-inflammatory drugs (NSAIDs), including COX-2 inhibitors, can help relieve the pain associated with osteonecrosis. Analgesics, such as acetaminophen, are another option. Heating pads, warm baths and electric blankets can help relieve muscle spasms and pain. These measures may provide some relief, but they do not change the underlying process.

In the early stages of osteonecrosis, you must avoid stress to the affected area. If your hips or knees are involved, limit the amount of standing and walking you do. If your shoulders are

involved, limit the amount of carrying that you do. While sitting, raise your legs. Your doctor will probably prescribe crutches or a cane to help take some of the weight off the affected joint or joints. Non-weight-bearing exercises such as water exercises also are helpful in maintaining and increasing the strength of the surrounding muscles. Keep in mind that although none of these measures will reverse or alter the course of osteonecrosis, they will help make you more comfortable and delay the need for joint replacement surgery.

The ultimate goal is to prevent the collapse of the affected bone. This is because once bone collapse occurs, the compounding joint architecture is affected and joint replacement surgery often becomes necessary. In the very early stage of the disease, a surgical treatment called *core decompression* may be helpful. This procedure involves drilling a hole in the affected bone, relieving pressure and allowing more blood to flow in. A new blood supply is created within the channel of fibrous tissue growing into the drilled hole. Bone grafts sometimes are used in these core sites in an attempt to support the bone until the new blood supply has been established.

Although these surgical treatments may improve the chances of healing, they are not considered to be 100 percent effective. In fact, they may be effective only early in the course of the process, before bone collapse has occurred. However, progress is being made, and surgical treatment generally produces more favorable results than if you relied only on non-surgical forms of treatment. A rheumatologist or orthopaedic surgeon who specializes in the treatment of this condition will be the best judge of what would help you.

HOW CAN IT BE PREVENTED?

There's a lot of truth to the expression, "Prevention is the best medicine." If you're taking large doses of glucocorticoids, it's important for you to see your doctor on a regular basis. This is because glucocorticoids should only be used when absolutely necessary, in the smallest effective dose possible, and for the smallest amount of time possible. Otherwise you risk developing undesirable side effects such as osteonecrosis.

It would also be wise to limit alcohol consumption. Guidelines vary depending upon your condition and whether you're taking glucocorticoids. It's recommended that people not on glucocorticoids limit their alcohol consumption to less than two drinks per day. Those people taking glucocorticoids should limit their alcohol intake to less than two drinks daily, and then only on an occasional basis. And those people with osteonecrosis of one joint should stop their alcohol intake altogether because of possible involvement of other joints. By following such preventive measures, you also reduce your risk of developing *osteoporosis* (thinning of the bones) and gastric ulcers.

IN SUMMARY

Research into the cause of and cure for osteonecrosis continues. Until the cause and cure are found, you and your doctor can do much to make life with osteonecrosis easier. Medications to relieve pain, limitation of weight-bearing activities and avoidance of stress in a joint affected by osteonecrosis improves symptoms and prevents the progression of osteonecrosis. Follow your treatment program.

THE ARTHRITIS FOUNDATION

The mission of the Arthritis Foundation is to improve lives through leadership in the

prevention, control and cure of arthritis and related diseases.

The Arthritis Foundation supports research with the greatest potential for advances and has invested more than \$320 million in these efforts since its inception in 1948. Additionally, the Arthritis Foundation supports key public policy and advocacy efforts at a local and national level in order to make a difference on behalf of 70 million people living with arthritis.

As your partner in taking greater control of arthritis, the Arthritis Foundation also offers a large number of programs and services nationwide to make life with arthritis easier and less

painful and to help you become an active partner in your own health care.

Contact us at (800) 283-7800 or visit us on the Web at www.arthritis.org to become an Arthritis Advocate or to find out how you can become involved.

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For more information: The Arthritis Foundation offers a wide variety of books, brochures and videos about different forms of arthritis, treatment and self-management techniques to help you take control of your arthritis. To order any of these products, become an Arthritis Foundation member or to subscribe to the Arthritis Foundation's award-winning consumer health magazine, *Arthritis Today*, call (800) 283-7800. Call or visit our Web site (www.arthritis.org) to find out how you can take control of your arthritis and start living better today!

MISSION STATEMENT:

The mission of the Arthritis Foundation is to improve lives through leadership in the prevention, control and cure of arthritis and related diseases.

This brochure has been reviewed by the
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