Avascular Necrosis

Avascular necrosis is a disease resulting from the temporary or permanent loss of the blood supply to the bones. Without blood, the bone tissue dies and causes the bone to become soft. If the process involves the bone near a joint, it may lead to collapse of the joint surface. This disease is also known as:

- *Osteonecrosis*.
- *Aseptic necrosis*.
- *Ischemic bone necrosis*.

Avascular necrosis most commonly affects the ends (*epiphysis*) of long bones. The femur, the bone extending from the knee joint to the hip joint, is the bone most commonly involved. The disease may affect just one bone or more than one bone, and at different times. It affects men and women equally. Avascular necrosis occurs at any age. But it is more common between the ages of 30 and 50 years.

SYMPTOMS

In early stages patients may not have any symptoms. But as the disease progresses, joint pain generally develops. At first there is pain when putting weight on the affected joint, and then when resting. Pain usually develops gradually. It may be mild or severe. As the disease progresses and the bone and surrounding joint surface collapses, pain may develop or increase dramatically. Pain may be severe enough to limit range of motion in the affected joint. The period of time between the first symptoms and loss of joint function is different for each patient. This can range from several months to more than a year. Disability depends on:

- What part of the bone is affected.
- How large an area is involved.
- How effectively the bone repairs itself.
- If other illnesses are present.
- Treatment of cancer by medications (*chemotherapy*).
- Radiation.
- The cause of the avascular necrosis.

DIAGNOSIS

The diagnosis of aseptic necrosis is usually made by:

- Taking a history.
- Doing an exam.
- Taking x-rays. (If x-rays are normal an MRI is generally required.)
- Sometimes further blood work and specialized studies may be necessary.

TREATMENT

Treatment for this disease is necessary to maintain joint function. If untreated, most patients will suffer severe pain and limitation in movement within 2 years. Several treatments are available that help prevent further bone and joint damage. They can also reduce pain. To determine the most appropriate treatment, the caregiver considers the following aspects of a patient's disease:

- The age of the patient.
- The stage of the disease. Early or late.
- The location and amount of bone affected. A small or large area.
- The underlying cause of avascular necrosis.

The goals in treatment are to:

- Improve the patient's use of the affected joint.
- Stop further damage to the bone.
- Improve bone and joint survival.

Your caregiver may use one or more of the following treatments:

- **Reduced Weight Bearing.** If avascular necrosis is diagnosed early, the caregiver may begin treatment by having the patient limit weight on the affected joint. The caregiver may recommend limiting activities or using crutches. In some cases, reduced weight bearing can slow the damage caused by the disease and permit natural healing. When combined with medication to reduce pain, reduced weight bearing can be an effective way to avoid or delay surgery for some patients. Most patients eventually will need surgery to reconstruct the joint.
- **Core Decompression**. Core decompression works best in people who are in the earliest stages of avascular necrosis, before the collapse of the joint. This procedure often can reduce pain and slow the progression of bone and joint destruction in these patients. This surgical procedure removes the inner layer of bone, which:
  - Reduces pressure within the bone.
  - Increases blood flow to the bone.
  - Allows more blood vessels to form.
  - Reduces pain.
- **Osteotomy**. This surgical procedure re-shapes the bone to reduce stress on the affected area of the joint. There is a lengthy recovery period. The patient's activities are very limited for 3 to 12 months after an osteotomy. This procedure is most effective for younger patients with advanced avascular necrosis, and those with a large area of affected bone.
- **Bone Graft**. A bone graft may be used to support a joint after core decompression. Bone grafting is surgery that transplants healthy bone from one part of the patient, such as the leg, to the diseased area. Sometimes the bone is taken with it's blood vessels which are attached to local blood vessels near the area of bone collapse. This is called a vascularized bone graft. There is a lengthy recovery period after a bone graft, usually from 6 to 12 months. This procedure is technically complex.
- **Arthroplasty/Total Joint Replacement**. Total joint replacement is used in late-stage avascular necrosis, and when the joint is deformed. In this surgery, the diseased joint is replaced with artificial parts. It may be recommended for people who are not good candidates for other treatments, such as patients who may not do well with repeated attempts to preserve the joint. Various types of replacements are available, and people should discuss specific needs with their caregiver.

New treatments being tried include:

- The use of medications.
- Electrical stimulation.
- Combination therapies to increase the growth of new bone and blood vessels.

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