Osteonecrosis, which is also called avascular necrosis (AVN) or aseptic necrosis, is a condition in which the death of bone cells due to decreased blood flow can lead to pain and collapse of areas of bone.

Osteonecrosis

The bones in the joints of the human body require a steady supply of blood to remain healthy. Severe decreases in this blood flow can result in bone cell death, called osteonecrosis, causing the bone to collapse before the body is able to make repairs. The condition is not fatal, but osteonecrosis can lead to pain, arthritis, problems with physical activity and even the need for joint replacement.

Fast facts

- Osteonecrosis can cause severe pain and disability much like arthritis.
- It is easier to prevent osteonecrosis by limiting alcohol and corticosteroid use than it is to treat it.
- Although it can occur in almost any bone of the body, some locations are more common. The cause and treatment for osteonecrosis of the jaw differs from that for osteonecrosis found in other locations.

What is osteonecrosis?

Osteonecrosis, which is also called avascular necrosis (AVN) or aseptic necrosis, is a condition in which the death of bone cells due to decreased blood flow can lead to pain and collapse of areas of bone. This collapse of bone, in turn, can lead to degenerative arthritis of nearby joints, most commonly the hips and knees. Less often affected are the shoulders, hands and feet.

In rare instances, osteonecrosis can occur in the jaw, resulting in pain and mouth ulceration.
What causes osteonecrosis?
Conditions commonly associated with osteonecrosis are serious trauma which interrupts the bone’s blood supply, extended and/or high doses of corticosteroid medications (such as prednisone and Solu-Medrol or methylprednisolone), and excessive alcohol consumption.

Other conditions associated with osteonecrosis include:
- Lupus
- Dysbarism (the “bends” that occur with scuba-diving)
- Blood disorders such as sickle cell anemia
- HIV infection
- Radiation therapy

The cause of osteonecrosis of the jaw is less certain. It may be that bisphosphonate medications, such as alendronate or risedronate, when used to treat osteoporosis, interfere with the body’s ability to repair bone after dental trauma/surgery, or infection.

Who gets osteonecrosis?
Most of the 10,000 to 20,000 Americans developing osteonecrosis annually are between the ages of 20 and 50. These individuals usually have a history of serious trauma or corticosteroid use, excess of alcohol intake, or other specific conditions.

Osteonecrosis of the jaw occurs as a rare complication of treatment with medications called bisphosphonates. It has been seen primarily in patients with multiple myeloma or breast cancer who are receiving frequent doses of intravenous bisphosphonate medications such as zoledronate or pamidronate.

How is osteonecrosis diagnosed?
Osteonecrosis is suspected most often when a person with risk factors for the condition experiences localized bone-type pain. Hip pain due to osteonecrosis is often felt in the groin. Pain due to hip or knee osteonecrosis is usually worse with weight-bearing or walking.

The next step in diagnosis is to obtain a radiograph (x-ray) of the painful area. Because these radiographs may appear normal in the early stages of disease, other imaging studies such as bone scans or magnetic resonance imaging (MRI) may be scheduled. MRI is excellent at detecting very early osteonecrosis.

Osteonecrosis of the jaw is diagnosed by both seeing bare bone during examination and using dental radiographs.

How is osteonecrosis treated?
Unfortunately there is no clear evidence indicating the best way to treat osteonecrosis. Often treatment starts with pain medications and limiting weight-bearing on affected areas. This type of conservative therapy may work well for patients with early osteonecrosis in small areas of bone. However, it does not work for those with hip or knee osteonecrosis who are facing progressive bone collapse.
Instead, surgical procedures may be recommended to relieve pain and, hopefully, prevent bone collapse. A procedure called core decompression may be used to remove a piece (core) of bone from the affected area in an attempt to improve blood flow. More advanced cases may need a procedure called osteotomy, during which surgeons remove dead bone and re-position the bone so that the weight-bearing joint surface is supported by healthy bone. If joint collapse has already occurred, total joint replacement of the hip or knee is often required to improve pain and function.

There is no proven medical therapy for osteonecrosis, but some doctors suggest treatment with bisphosphonate medications such as alendronate or resorronate. Recent studies have suggested that bisphosphonate medications may, at least in the short term, improve and slow or even prevent bone collapse.

Treatment of osteonecrosis of the jaw is uncertain. Bisphosphonate medications should be stopped and antibiotics may be given to help relieve pain.

Prevention
The most important ways to prevent osteonecrosis are to avoid excessive alcohol intake and work with your physician to limit corticosteroid use. Tobacco use also should be avoided as it has been implicated as a possible risk factor for osteonecrosis.

Prevent osteonecrosis of the jaw with good dental hygiene. If you need any dental work, complete that before starting bisphosphonate therapy or as soon after starting as possible. See your dental practitioner immediately if there is any sign of dental infection.

Living with osteonecrosis
Some individuals will develop osteoarthritis (degenerative arthritis) as a consequence of osteonecrosis.

Points to Remember
- Work closely with your health care professional to limit corticosteroid use and limit alcohol intake.
- Early diagnosis and early treatment may improve the outcome.

To find a rheumatologist
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The American College of Rheumatology has compiled this list to give you a starting point for your own additional research. The ACR does not endorse or maintain these Web sites, and is not responsible for any information or claims provided on them. It is always best to talk with your rheumatologist for more information and before making any decisions about your care.

Medlineplus: Osteonecrosis
www.nlm.nih.gov/medlineplus/osteonecrosis.html

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