AVASCULAR NECROSIS AND HOMOEOPATHY

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Bone is living tissue that provides shape and support for the body, as well as protection for some organs. Bone also serves as a storage site for minerals and provides the medium—marrow—for the development and storage of blood cells.

Because the functions of bone are numerous and complex, there are many disorders that require clinical care by a physician or other healthcare professional.

Synonyms

Avascular necrosis, osteonecrosis, aseptic necrosis, or ischemic bone necrosis.

Avascular Necrosis is a disease that results from the temporary or permanent loss of blood supply to the bone. When blood supply is cut off, the bone tissue dies and the bone collapses. If avascular necrosis occurs near a joint, collapse of the joint surface may occur.

It may occur in any bone, but most commonly occurs in the ends of a long bone. It may affect one bone, several bones at one time, or different bones at different times. It most commonly affects the ends (epiphysis) of long bones such as the femur, the bone extending from the knee joint to the hip joint. Other common sites include the upper arm bone, knees, shoulders, and ankles.

The disease may affect just one bone, more than one bone at the same time, or more than one bone at different times.

Although avascular necrosis may affect both genders and all age groups, it most-commonly occurs to people in their 30s and 40s.

The amount of disability that results from avascular necrosis depends on what part of the bone is affected, how large an area is involved, and how effectively the bone rebuilds itself.

Causes

Avascular necrosis may be the result of:

- traumatic causes - injury, fracture, or damage to blood vessels
- non-traumatic causes - long-term use of medications, such as corticosteroids, or excessive, long-term use of alcohol
- Other theories and associations have been suggested as risk factors.
- Increased pressure within the bone also is associated with avascular necrosis. The pressure within the bone causes the blood vessels to narrow, making it hard for the vessels to deliver enough blood to the bone cells.
- Injury - when a joint is injured, as in a fracture or dislocation, the blood vessels may be damaged. This can interfere with the blood circulation to the bone and lead to trauma-related avascular necrosis. Studies suggest that this type of avascular necrosis may develop in more than 20 percent of people who dislocate their hip joint.

Steroid Medications

Corticosteroids such as prednisone are commonly used to treat diseases in which there is inflammation, such as systemic lupus erythematosus, rheumatoid arthritis, inflammatory bowel disease, and vasculitis. Studies suggest that long-term, systemic (oral or intravenous) corticosteroid use is associated with 35 percent of all cases of nontraumatic avascular necrosis. However, there is no known risk of avascular necrosis associated with the limited use of steroids.

Corticosteroids may interfere with the body's ability to break down fatty substances. These substances then build up in and clog the blood vessels, causing them to narrow. This reduces the amount of blood that gets to the bone. Some studies suggest that corticosteroid-related avascular necrosis is more severe and more likely to affect both hips (when occurring in the hip) than avascular necrosis resulting from other causes.

Alcohol Use

Excessive alcohol and corticosteroid uses are two of the most common causes of nontraumatic avascular necrosis. In people who drink an excessive amount of alcohol, fatty substances may block blood vessels, causing a decreased blood supply to the bones that result in avascular necrosis.

Other Risk Factors

Suggested risk factors for avascular necrosis include:

- Injury
- Alcohol use
- Steroid use
- Gaucher's disease
- Pancreatitis
- Radiation treatments
- Chemotherapy
- Decompression disease
- Blood disorders, such as sickle cell anemia
- Avascular necrosis affects both men and women and affects people of all ages.

Symptoms

The following are the most common symptoms for avascular necrosis, however, each individual may experience symptoms differently. Symptoms may include:

- minimal early joint pain
- increased joint pain as bone and joint begin to collapse
- limited range of motion due to pain

The symptoms of avascular necrosis may resemble other bone problems. In the early stages of avascular necrosis, patients may not have any symptoms. As the disease progresses, however, most patients experience joint pain—at first, only when putting weight on the affected joint, and then even when resting.

Pain usually develops gradually and may be mild or severe. If avascular necrosis progresses and the bone and surrounding joint surface collapse, pain may develop or increase dramatically. Pain may be severe enough to limit the patient's range of motion in the affected joint. In some cases, particularly those involving the hip, disabling osteoarthritis may develop.

The period of time between the first symptoms and loss of joint function is different for each patient, ranging from several months to more than a year.

Diagnosis

Imaging procedures, such as:

- x-ray
- computed tomography (CT or CAT)
- magnetic resonance imaging (MRI)
- radionuclide bone scan

Biopsy, such as:

- needle biopsy
- open biopsy

- functional evaluation of bone

X Ray

An x ray is a common tool that the doctor may use to help diagnose the cause of joint pain. It is a simple way to produce pictures of bones.

The x ray of a person with early avascular necrosis is likely to be normal because x rays are not sensitive enough to detect the bone changes in the early stages of the disease. X rays can show bone damage in the later stages, and once the diagnosis is made, they are often used to monitor the course of the condition.

Magnetic Resonance Imaging (MRI)

MRI is quickly becoming a common method for diagnosing avascular necrosis. Unlike x-rays, bone scans, and CT (computed/computerized tomography) scans, MRI detects chemical changes in the bone marrow and can show avascular necrosis in its earliest stages.
MRI provides a picture of the area affected and the bone rebuilding process. In addition, MRI may show diseased areas that are not yet causing any symptoms.

Bone Scan

Also known as bone scintigraphy, bone scans are used most commonly in the patients who have normal x-rays. A harmless radioactive dye is injected into the affected bone and a picture of the bone is taken with a special camera.

The picture shows how the dye travels through the bone and where normal bone formation is occurring. A single bone scan finds all areas in the body that are affected, thus reducing the need to expose the patient to more radiation. Bone scans do not detect avascular necrosis at the earliest stages.

Computed/Computerized Tomography

A CT scan is an imaging technique that provides the doctor with a three-dimensional picture of the bone. It also shows "slices" of the bone, making the picture much clearer than x rays and bone scans. Some doctors disagree about the usefulness of this test to diagnose avascular necrosis.

Although a diagnosis usually can be made without a CT scan, the technique may be useful in determining the extent of bone damage.

Biopsy

A biopsy is a surgical procedure in which tissue from the affected bone is removed and studied. Although a biopsy is a conclusive way to diagnose avascular necrosis, it is rarely used because it requires surgery.

Functional Evaluation of Bone

Tests to measure the pressure inside a bone may be used when the doctor strongly suspects that a patient has avascular necrosis, despite normal results of x-rays, bone scans, and MRIs. These tests are very sensitive for detecting increased pressure within the bone, but they require surgery.

Treatment

Specific treatment for avascular necrosis will be determined on basis of :

- Underlying cause of the disease
- Patient's overall health and medical history
- The age of the patient
- The stage of the disease—early or late i.e. extent of the disease
- Patient's tolerance for specific medications, procedures, or therapies
- Expectations for the course of the disease
- Doctor's opinion or preference
- Location and amount of bone affected

The goal of treatment is to improve use or stop further damage. Treatments are necessary to keep joints from breaking down, and may include:

- Medications for pain

- Assistive devices to reduce weight on the bone or joint
- Core decompression
- Osteotomy
- Bone graft
- Arthroplasty (total joint replacement)
- Other treatments may include electrical stimulation, and combination therapies to encourage the growth of new bone.

Appropriate treatment for avascular necrosis is necessary to keep joints from breaking down. If untreated, most patients will experience severe pain and limitation in movement within 2 years.

Conservative Treatment

- Medicines—to reduce fatty substances (lipids) that increase with corticosteroid treatment or to reduce blood clotting in the presence of clotting disorders.
- Reduced weight bearing—If avascular necrosis is diagnosed early, the doctor may begin treatment by having the patient remove weight from the affected joint. The limiting activities or using crutches may be recommended.

In some cases, reduced weight bearing can slow the damage caused by avascular necrosis 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.

- Range-of-motion exercises—may be prescribed to maintain or improve joint range of motion.
- Electrical stimulation—to induce bone growth.

Conservative treatments have been used experimentally alone or in combination. However, these treatments rarely provide lasting improvement. Therefore, most patients will eventually need surgery to repair the joint permanently.

Surgical Treatment

- ***Core decompression*—**This surgical procedure removes the inner layer of bone, which reduces pressure within the bone, increases blood flow to the bone, and allows more blood vessels to form. Core decompression works best in people who are in the earliest stages of avascular necrosis, often before the collapse of the joint. This procedure sometimes can reduce pain and slow the progression of bone and joint destruction in these patients.
- ***Osteotomy*—**This surgical procedure reshapes the bone to reduce stress on the affected area. There is a lengthy recovery period, and the patient's activities are very limited for 3 to 12 months after an osteotomy. This procedure is most effective for 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. Commonly, grafts (called vascular grafts) that include an artery and veins are used to increase the blood supply to the affected area. There is a lengthy recovery period after a bone graft, usually from 6 to 12 months. This procedure is complex and its effectiveness is not yet proven. Clinical studies are under way to determine its effectiveness.
- ***Arthroplasty/total joint replacement*—**Total joint replacement is the treatment of choice in late-stage avascular necrosis and when the joint is destroyed. 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 do not do well with repeated attempts to preserve the joint. Various types of replacements are available, and people should discuss specific needs with their doctor.

Homoeopathic Therapeutics-

ALLEN - Phosphorus - FACE. - Chin. - Closure of the jaws so that she could not separate the teeth, Trismus. Glandular swelling of the articulation of the lower jaw, Inferior maxillary bone completely denuded of soft parts, and its surface grayish, rough, rugous, and covered with a fetid suppuration. After remaining a month, she left the hospital, and died soon after. The disease now seemed to involve the whole of the right side of the lower jaw, without there being made the least attempt, seemingly, by the periosteum to replace the dead bone with a new casing of osseous deposit such as usually forms in ordinary cases of necrosis. Suffered much from violent toothache, accompanied with considerable swelling of the right side of the face; he had a double tooth extracted, but without relief; the affection progressed so quickly that in a short time he ceased to be able to follow his employment; one tooth after another dropped out; he became so weak that he was unable to work; a swelling of the size of an egg formed below the right orbit, which in

a fortnight burst, discharging a large quantity of white pus; he continued to get worse, all the teeth having fallen out, the gums of the lower jaw retracted, and he now presents the following appearance. The right cheek is considerably swollen; at the right angle of the lower jaw exists and opening, discharging laudable pus, through which the probe can be passed a couple of inches along bare bone; two inches anterior to this there is another aperture likewise leading to dead bone; on opening the mouth, the whole of the lower jaw, as far as the ascending rami and down to the reflection of the mucous membrane on the cheek, is quite dead, denuded, and of a leaden-grayish color.
Toothache in the left lower jaw, formation of an ulcer on the side of the middle back tooth with violent pains; as the ulcer opened a piece of bone was discharged; at last the cheek became swollen and erysipelatous and abscesses formed, which discharged much matter; the necrosis of the bone progressed until the whole half of the lower jaw had to be removed. A carious molar of the right side of the lower jaw was extracted; from this time (seven months since)the peculiar Phosphorus necrosis may be said to have fairly begun, and it progressed rapidly, for the subject of it was compelled to give up the charge of his department about a fortnight after the tooth was drawn. The face was very much deformed by indurated swelling, which was particularly conspicuous on the right side and about the chin; three fistulous openings, surrounded by flabby granulations, were upon the right side of the neck; from these fetid pus exuded freely; a horribly offensive odor came from the mouth, and saliva and pus were constantly dribbling out; the gums were spongy on the margin, but partook of the general induration at the sides; four sound but loose teeth occupied the right alveolar cavities; the upper jaw seemed healthy; the patient could not part the two jaws sufficiently to introduce a finger with facility; a probe detected necrosed bone both on examination in the mouth and through the sinuses; the examinations gave excessive pain; a portion of the left lower jaw only seemed clear of the disease; the symphysis was completely involved.
The Phosphorus disease of the jaw consists in the first stage of an inflammatory swelling of the gum and soft parts of the mouth, extending over the face and neck, associated with the development of masses of osteophyte of varying extent and thickness about the jaw; in the second stage the teeth become black, the gum recedes, the osteophytes suppurate, and the jaw becomes denuded, rough, and blackish or grayish-green, and the teeth fall out; this stage is associated with the most violent pain in the face and head, disturbance of digestion, sleeplessness, fever, salivation, fistulous burrowing of the matter in the muscles and integuments of the face, which became erysipelatous, followed by exfoliation of the bone, and sometimes by extension of the necrosis to all the bones of the skull, and death with hectic fever.

The affection of the bone is difficult to characterize; it is not a simple caries, nor is it a simple necrosis; the soft parts detach themselves from the bone to a large extent, and leave below a bony, gray, rough, but solid surface, and a gray fetid suppuration exhales; after an uncertain period this separates, without any appearance of new bone being formed.

BOERICKE - Hecla lava- Marked action upon the jaws. Of great use in exostosis, gum abscess, difficult teething. Nodosities, caries of bone, etc. Osteitis, periostitis, osteosarcoma; rachitis. Tumors in general. Bone necrosis. Necrosis and sinus after mastoid operation.

BOGER - Nitricum acidum - External Head- Exostoses Cephalic bone pains as tho' skull were constricted by a band, readily passing into inflammation and necrosis.

HAHNEMANN - Mercurius solubilis- Necrosis of the bone of the upper jaw - Spasmodic movement of the lips.

HERING - Aurum muriaticum - Lower Limbs- Exostoses, with bone pain in both shinbones. Secondary syphilis. Right tibia, anterior aspect of bone denuded and black nearly its entire length, surrounding soft parts inflamed and swollen; with a boy, aet. 12, exfoliating and healing within six months. Necrosis.

HERING - Hecla lava - Lower Limbs- Hip disease. Exostoses of tibia; nodosities very large; severe, continuous pain, incapacitating him from work; the exostoses and portion of periosteum, which had become carious and soft, were removed by operation; necrosis of whole bone had been diagnosed; three days after administration of Hekla lava the pain, which still continued after operation, subsided, and by end of second week wound had healed. Caries of bones of feet. Pains in tibiae at night.
Necrosis of right tibia; sequestrum extending over nearly two-fifths of length of bone and about 1/2 cm. in thickness; enormous discharge of mucus from mouth every morning; difficult and very annoying; conjunctivitis of right eye.
Ulcers on tibia; periosteum affected, profuse watery offensive discharge. Ulcers on legs.

HERING - Phosphorus - Smell and Nose- swelling of nose: red, shining; painful to touch; with coryza; of nasal bones. Necrosis; periosteum raised, forms a new stratum of bone. Painful swelling of lower jaw; skin over jaw red and tense; necrosis of lower jaw;

HERING – Psorinum- Necrosis of temporal bone, Serous choroiditis, strong and well until one day he was compelled to run after a horse until exhausted; debility and sweating.
Stages of Life, Constitution -necrosis of temporal bone.

HERING - Silicea terra - Lower Limbs- Two fistulae at inferior third of femur, which (in spite of caustics) refused to close; whole foot swollen and red, and caries easily demonstrated.
Boy, aet. 15, two years ago had a painless soft swelling on outer side of left femur, just below trochanter, as large as a hen's egg, which in a few days opened and discharged thin, excoriating, watery pus; soon spiculae of bone of a dark color were thrown out, some almost black and occasionally in form of scales; there were three openings about size of a wheat straw, with elevated rounded edges; limb flexed, walked with the aid of a cane; occasional attacks of constipation, when, after much straining, feces were brought to verge of anus, they seemed to slip back. Necrosis of femur.

Left: lying on side, vertigo; sickening pain in side of head; parietal bone is covered with a large, soft, elastic swelling; piercing stinging in eye; pressive pain over eye; shooting pain in ear; pricking, aching, itching in ear; chronic sinus in front of ear; sac swollen and itching; abscess of arm; induration from corner of mouth to cheek; caries of lower jaw; abscess of arm; pricking in throat as of a lump in side of throat; soreness, swelling from inguinal region across mons veneris; tearing in thigh; boring pain in temple, supraorbital nerve and orbit of eye; darting in nipple; pain in nodular swelling of breast; heavy râles in bronchus; tumor in breast; anchylosis of shoulder joint; small tumor in breast; tumor side of neck; swelling of scapula; shaking of arm; a large fleshy wart on forearm; a ganglion on wrist; middle fingers flexed and stiffened; pain in index finger; thumb swollen from a bite; necrosis of thigh; shooting in thigh; ankle and foot swollen; painless soft swelling on femur; knee joint double size of healthy one; eruption in bend of knee; pricking and stitches in heel; caries of great toe; coldness of side; shaking and twisting of arm.
From right to left: pain in temples.

KENT - Aurum metallicum- the skull bones are sensitive to touch; the periosteum is tender to touch. In old mercurialized cases with bone affections and necrosis of the skull, as in syphilis and mercury, the hair falls out copiously; the head becomes bald. Baldness due to syphilis; the scalp is left shiny and the hair will not grow in again. In acute diseases there is falling out of the hair, but it grows in again. Exostoses as in syphilis.
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KENT - Dulcamara- Sometimes it starts as nothing more than an herpetic eruption, but it spreads and finally yellow pus forms and then the granulations that should come, do not come, an eating condition appears and the surface does not heal. Especially along the shin bone there will be raw places, which even extend to the periosteum, to the bone, producing necrosis and caries; so we have affections of the mucous membranes or skin, first becoming vesiculated and then breaking open and eating.

KENT - Fluoricum acidum- Think of the remedy, then in vicious bone diseases, in necrosis and caries, in fistulous openings, fistula leading to the teeth, fistula lachrymalis and fistula in ano; in calcareous degenerations; in deformity of the nails, hair and teeth; in affections of the thigh bones and leg bones, with chronic fistulous openings leading to bone discharging pus which excoriates the parts all around.
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KENT - Hepar sulphur- The bone even suppurates and takes on necrosis and caries.

KENT - Manganum-act- Manganum is pre-eminently a drug that causes a species of chlorosis, and it is suitable for chlorotic girls, in broken down constitutions, waxy, anaemic, pallid, sickly, threatening phthisis, with necrosis and caries of bone and organic affections.
There is the history of a long period of scanty menstruation, or the menses have been delayed until the patient was eighteen or twenty years of age.

KENT - Theridion curassavicum- Necrosis of bone. Quick consumption.

SAMUEL - Theridion curassavicum- Bone affections: rachitis, caries, necrosis.