

STEVEN CHUDIK MD
SHOULDER, KNEE & SPORTS MEDICINE

Avascular Necrosis (AVN) of the Knee

For tissue to remain healthy and function normally, it requires a healthy blood (vascular) supply. Patients can develop a rare condition in their subchondral bone (bone beneath and supporting the joint surface) called avascular (“without blood”) necrosis (“death/dying”), or AVN, where the bone loses blood supply, dies, and then fractures and eventually collapses without proper treatment. AVN usually affects bone just under the joint surface and can lead to collapse of the joint surface and painful arthritis.

There are two types of AVN: traumatic and atraumatic. Traumatic AVN may occur following an injury such as a dislocation, while atraumatic can happen with certain diseases, blood disorders, or taking medication such as corticosteroids. Occasionally, it can develop for no discernible reason.



MRI shows a large area of AVN of the medial femoral condyle of the knee.



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Frequent Signs and Symptoms

- Deep, throbbing, aching pain
- Pain becoming more consistent, begins to hurt at rest
- “Crepitus” crunching or cracking sensation

Etiology (Causes)

- An injury such as a dislocation or fracture
- Blood disorders or diseases
- Reaction to corticosteroids
- Alcoholism

Risk Factors

- Contact or collision sports
- Activities with high risk of knee injury
- Taking prescription corticosteroids (which can damage bone)
- Sickle-cell disease, clotting disorders, etc.

Prevention

- Maintain appropriate conditioning, including knee and lower body flexibility, muscle strength, and endurance
- Maintain proper technique when exercising, and have a coach/professional correct improper technique
- Reduce fractures and dislocations as soon as possible

Outcomes

The goal of treatment is to re-vascularize the bone, bone graft, protect it from loading until it heals, maintain or restore the joint surface to prevent arthritis, and regain range of motion and function. Outcomes depend on the stage of the AVN. Early recognition affords us the opportunity to stimulate re-vascularization (new blood supply) and healing of the bone or bone graft lost bone before it compromises the joint surface.

Potential Complications

- Failure to save the bone with progressive fracture and collapse of the joint surface, leading to the development of arthritis and need for joint replacement surgery.
- Pain and inflammation of the knee joint may persist without treatment



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- Weakness and de-conditioning of the knee because of pain and limitations
- Uncommon complications following surgery:
 - Persistent pain
 - Infection and bleeding

General Treatment Considerations

If detected early by MRI, some AVN lesions can heal with rest and activity restriction. Gentle physical therapy can help to maintain motion during the rest period and restore strength and motion once the injury is healed.

More often surgery is required to stimulate, re-vascularize, and repair the avascular necrosis. Dr. Chudik can perform arthroscopic surgery to evaluate the AVN lesion. The surgical method is determined by the size and condition of the AVN lesion. Small loose fragments can be simply removed, and the surface of the bone is stimulated to promote a healing response. Large lesions can be drilled, bone grafted to stimulate healing, or replaced.

The surgery is performed with regional blocks and light anesthesia. Patients will be required to be non-weight bearing for six weeks post-operatively to allow the bone time to heal. Physical therapy is begun two days following surgery to restore range of motion while protecting the healing bone. If AVN is severe and the integrity of the joint surface is compromised, a knee replacement may be required.

Possible Medications

Prescription pain relievers are usually not prescribed for this condition except for post-surgical pain control.

Modalities

Cold is used to relieve pain and reduce swelling/inflammation from the arthritis. Ice packs or cryotherapy devices can be applied to the joint for 15 - 20 minutes, three to four times per day as needed. Be careful not to apply the ice directly on the skin and do not leave the ice on too long as it can cause severe, permanent injury to the skin.

Notify My Office If Symptoms Worsen



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