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Avascular Necrosis (AVN) of Talus

Although the term "bone dry" is used commonly, bones are actually filled with blood vessels that provide nutrition to the bone and allow the cells to adapt to the constant stress that is put on them. In cases of trauma, medication side effects, and for undefined reasons - the blood flow to certain bones is compromised. In the foot and ankle, the most common bone that can be affected is the talus. The talus bone connects the leg to the foot and is involved in the up and down and side to side motion of the ankle. When the bone loses it's blood flow the term that is used is - avascular necrosis - or lack of blood flow leading to bone death. This should not be confused with a situation of a necrotic foot or tissue that must be amputated, as this is not the case in this situation. Bone is constantly getting remodeled to stress by the cells within the bone. When the blood flow is lost, the cells die and are no longer able to remodel the bone to stress. This results in bone that is very brittle, similar to porcelain. The result is that there is pain and the bone can fragment and collapse causing severe arthritis. Pain is the most common presenting issue with this condition and is related to the need for high dose steroids that are required for some medical conditions.

A physical exam is done to determine the site of the pain and the prior incisions if related to prior trauma. The remaining amount of motion and any deformity is assessed. The location of pain is typically the ankle joint, however other sites of pain are noted in order to determine what is the best course of action. Plain radiographs are reviewed and further imaging with a weight bearing CT scan and MRI are done in

order to understand the extent of the pathology and the bony anatomy in order to formulate an appropriate treatment plan.

Treatment ranges from activity modification for mild cases where the bone is partially damaged to avoid impact activity. The use of a lace up ankle brace is considered to minimize angular stress on the bone as well in addition to providing pain relief. Intra-osseous bioplasty is a technique where we attempt to reintroduce healthy cells into the bone to try to provide for new cells to restore the viability of the bone. The mesenchymal signalling cells (stem cells) from your pelvis are taken, concentrated and introduced into the damaged bone with some bone graft to improve the quality of the bone. This is not always successful, but as the more aggressive surgical techniques are higher risk, it is a reasonable option to consider if the bone has not collapsed yet. If the bone has fragmented or collapsed significantly then two major options exist. One is a fusion where the avascular bone is removed and replaced by a cadaver bone that more normal architecture and infused with your mesenchymal signalling cells (stem cells) to provide healthy bone to allow for fusion (bones grow together to become one bone). This helps to minimize the pain, however, does result in loss of motion. Another option, though this is more early in development and very little long-term data exists, is to do what is called a total talus replacement. This is a procedure where a custom 3D talus is made based off of your healthy ankle and then implanted into the affected ankle to replace the damaged bone. The procedure is to provide more motion while minimizing the pain. Both options have pros and cons in addition to different longer term consequences and the ultimate decision is made after a thorough discussion with the patient to provide them the best option for their personal needs.