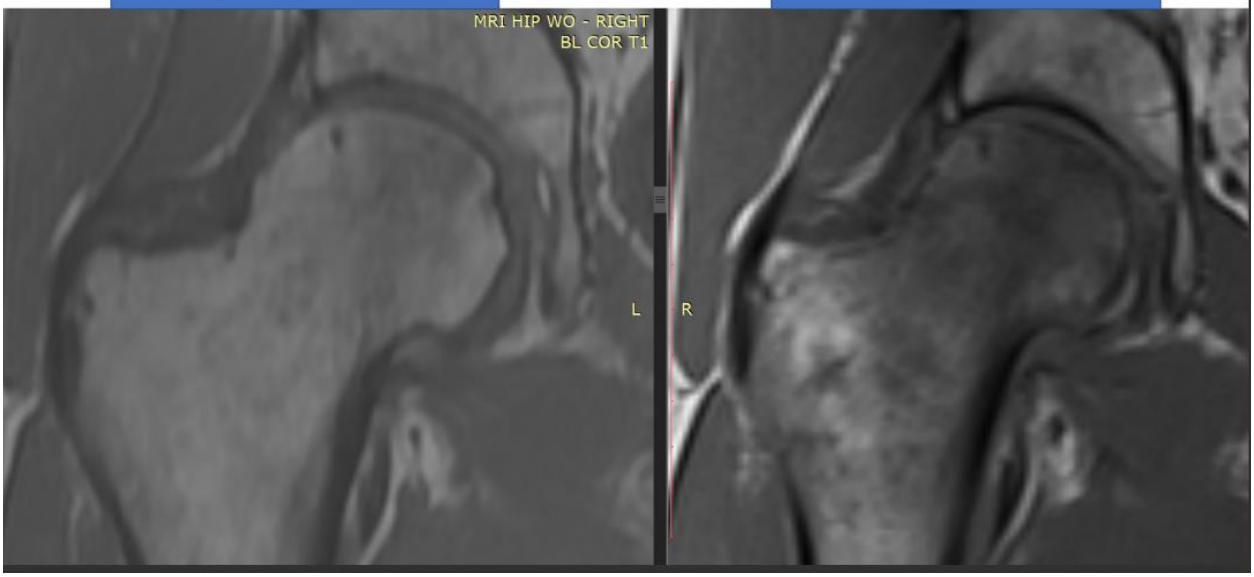
Avascular necrosis (AVN) of the femoral head is a challenging diagnosis and if missed or delayed, can result in significant disability and impact to patients. The condition is characterized by the death of bone tissue due to insufficient subchondral blood supply and the hip is the most common location for AVN to develop. Several risk factors for AVN have been identified and have been broken down into the following categories: direct cellular toxicity (such as chemotherapy, smoking, and alcohol abuse), extraosseous arterial fractures (hip dislocation, femoral neck fracture, iatrogenic post-surgery, congenital arterial abnormalities), extraosseous venous abnormalities or stasis, intraosseous extravascular compression (hemorrhage, elevated bone marrow pressure, fatty infiltration of bone marrow due to prolonged corticosteroid use, bone marrow edema, displaced fractures), and lastly, intraosseous intravascular occlusion (coagulation disorders and sickle cell crises).

A more rare and recent risk factor that should be considered in the development of AVN is COVID-19 vaccination and infection. A case report by Kashkosh et al. discusses how a healthy 40-year-old male develop sudden onset shoulder pain after receiving the COVID-19 vaccine and subsequently had AVN of the humeral head confirmed on MRI imaging. Another case report by Murugesan et al. demonstrated a 29-year-old male without any risk factors developed bilateral AVN after COVID-19 infection. There are several possible theories as to why the vaccine or infection may cause AVN, including a hypercoagulable state, the systemic inflammatory response triggered by COVID-19 with release of IL-17 and TNF-alpha which inhibit osteoblast proliferation and maturation, as well as inducing a deficiency in angiotensin-converting enzyme 2 which can accentuate bone loss.

This novel case report demonstrates another example of the possible association between COVID-19 vaccination and orthobiologics as a viable treatment option in this patient population. A 45-year-old male professor with no risk factors presented with bilateral hip pain, right worse than left. He had a history of left hip labral tear that was treated with PT and noted symptoms would flare up after covid immunization. After his COVID booster, he developed severe right hip pain and ultimately MRI diagnosed bilateral AVN, high grade ARCO 2 / early ARCO 3 on the right, and grade 1 on the left. Given the severity on MRI, bone marrow concentrate injection with bone augmentation was recommended and performed for the right hip. 6 months later, he was 95% percent improved from a pain and function standpoint and repeat MRI imaging demonstrated 80-90% resolution of the subchondral bone marrow edema. This case shows the importance of recognizing AVN earlier to increase success of orthobiologic treatment in order to avoid progression to severe arthritis or need for hip replacement, as well as considering COVID-19 infection or vaccination as a new risk factor for AVN.

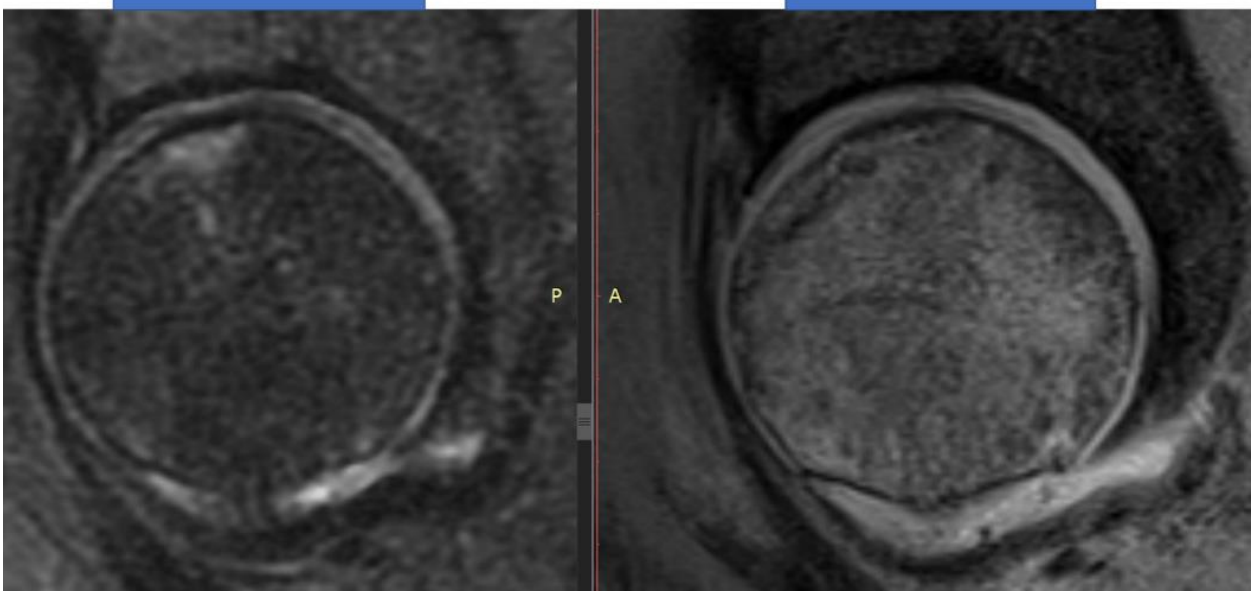
Updated MRI 6.2.22
(5 months post treatment)
BMC bone augmentation 1.6.22

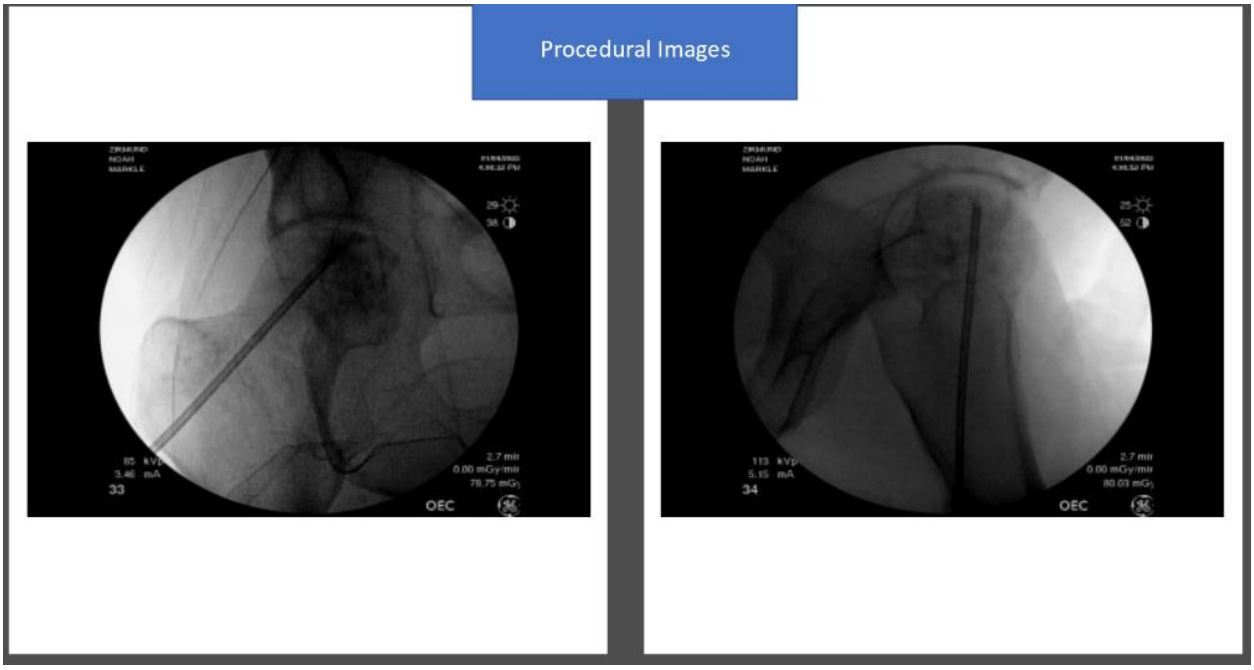
Initial MRI R hip 12.11.21



New MRI

Initial MRI





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