



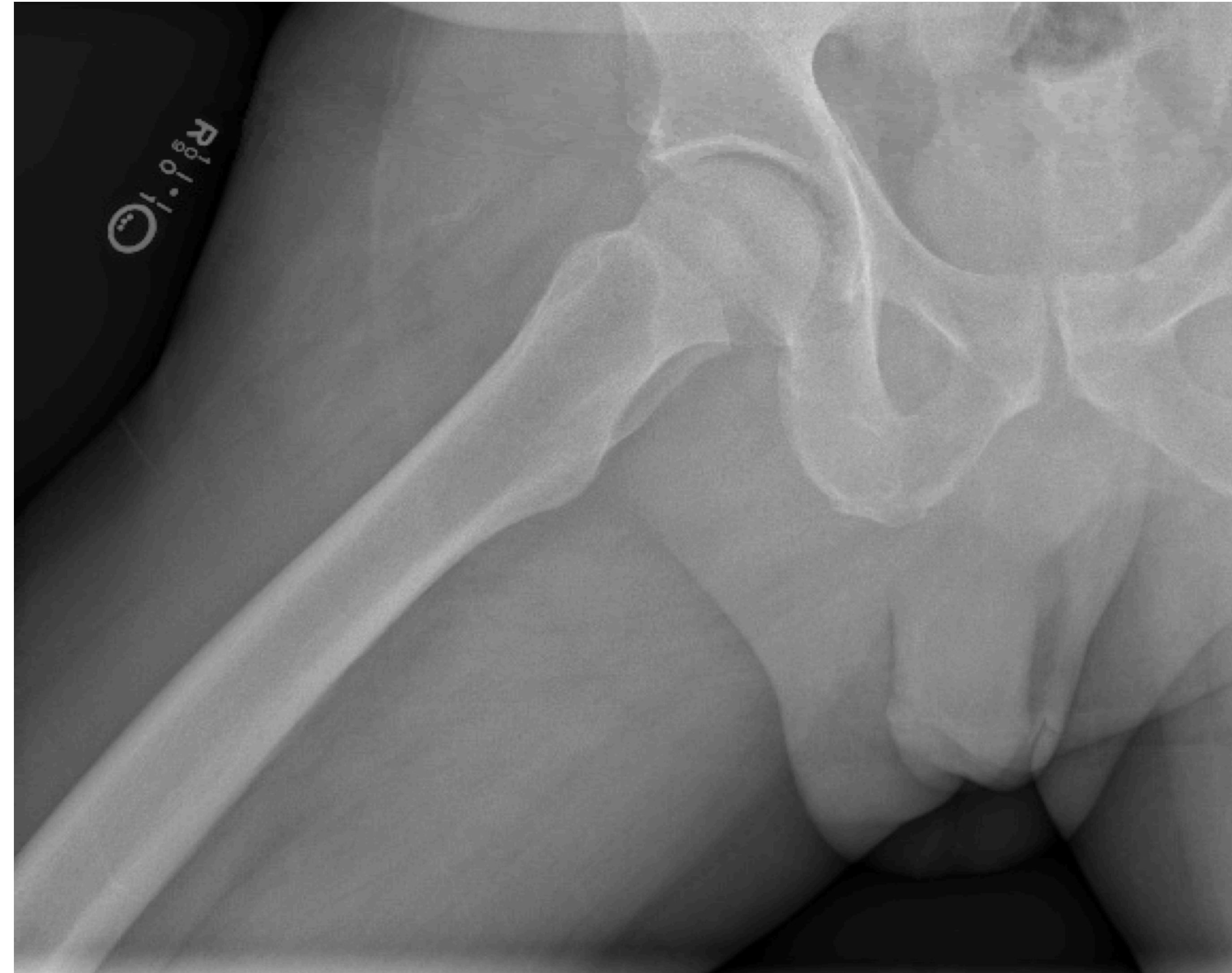
Introduction

- Vacuum phenomenon (VP) is a collection of gas within the joint space demonstrated by radiographs, CT, and MRI.
- Many pathologies such as degenerative joint disease, bone fracture, infection, and multiple myeloma can cause joint space expansion and VP.
- When volume in the joint space increases, pressure within the joint space subsequently falls.
- Decreasing pressure in the joint allows gas from surrounding tissues and synovial fluid to move into the joint space.
- Commonly associated with degeneration of the spine, VP can rarely occur in the hip causing low back, groin, buttock, or hip pain.

Case Summary

- 62-year old man with chronic right low back pain radiating to right hip and anteromedial leg secondary to L4-L5 radiculitis with diffuse degenerative changes.
- Previously treated in an interventional pain clinic by an L4-L5 interlaminar epidural steroid injection.
- At 1 month follow up, the patient reported 80% improvement of back pain with new, severe right hip and anteromedial thigh pain limiting his ability to walk independently.
- Physical exam was notable for antalgic gait, positive seated slump test on the right, and pain with external rotation and flexion at the hip.
- Anterior-posterior and frog leg position radiographs demonstrated vacuum phenomenon of the right hip without evidence suggestive of femoroacetabular impingement.
- After failing conservative management, the patient was treated with an intra-articular steroid injection in the right hip
- One week later, the patient reported 90% improvement in hip pain ratings with ability to walk 1-2 miles without pain. Improvement sustained over the following month.
- Patient continues to return to clinic for chronic back pain, without further complaints of hip pain.

Imaging



Plain radiograph of right hip demonstrating vacuum phenomenon with maintained hip joint space.



Plain radiograph of left hip demonstrating normal hip joint space and mild enthesopathy.

Discussion

- Non-vertebral VP is underreported due to little available research providing standardized methods of evaluation and treatment.
- VP can be indicative of infection, trauma, necrosis, or degeneration of the joint.
- VP can also be a primary cause of pain due to compression of surrounding nerves and cartilage within the joint space.
- VP should be considered as a differential diagnosis for joint pain, especially associated with chronic joint pathologies such as osteoarthritis or degeneration particularly in older adults.
- Further research is needed to establish a standardized algorithmic evaluation including gas pattern studies, clinical history, and physical examinations involved in diagnosing non-vertebral VP.

References

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