

The Use of Musculoskeletal Ultrasound in the Management of a Case of Massive Prepatellar Hemorrhagic Bursitis

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Abstract

Prepatellar bursitis has diverse aetiologies that range from acute trauma/infection, metabolic, crystal induced, to chronic occupational related causes. Our case reports a patient with cerebral palsy, who developed massive bilateral prepatellar haemorrhagic bursitis, refractory to non-steroidal anti-inflammatory medications. The pathophysiology of chronic prepatellar bursitis and the importance of ultrasound in the management of this patient's massive effusion is discussed further in this report.

Keywords: Prepatellar bursitis; Knee effusion; Massive; Hemorrhagic; Housemaid's knee; Carpet layer's knee; Musculoskeletal ultrasound

Introduction

Prepatellar bursitis can occur by acute trauma to the knee or by chronic minor assaults to the knee. The trauma leads to extravasation of nearby fluids into the bursa, which stimulates an inflammatory response [1].

Inflammation can also occur due to penetrating injury and infection, or due to crystal arthropathy such as gout. Physical exam often reveals bursal swelling, redness, and tenderness in both septic and aseptic bursitis. Some cases of aseptic bursitis include a haemorrhagic component that may result in more complex internal signal intensity. Bursitis is typically treated conservatively with aspiration, ice, rest, compression, and immobilization. Refractory cases of prepatellar bursitis may be treated with drainage or bursectomy.

Our case discusses a patient with chronic prepatellar bursitis that was refractory to non-steroidal anti-inflammatory drugs (NSAIDs), in whom musculoskeletal ultrasound was necessary for diagnosing and treating this condition.

Case Report

A 39-year-old man with cerebral palsy presented to our clinic with 1 year of increased swelling of his knees, especially the right knee. Patient had walked on his knees at home all his life and could no longer ambulate due to the swelling. Patient denied falls/trauma to the knees, fevers, chills, erythema or discharge. Prior episodes of swelling had resolved with Celebrex (a cyclooxygenase-2 selective NSAID). He takes no other medications, and his past medical history was unremarkable. He had an unsuccessful blind aspiration attempt in the ER, before subsequently being referred to our clinic after having undergone an x-ray and an MRI of his right knee.

On physical examination

Massive anterior knee swelling, Skin chronically discoloured but no overt signs of infection, Partially indurated to palpation, Fixed 90° flexion contractures (Figures 1-5).

Imaging

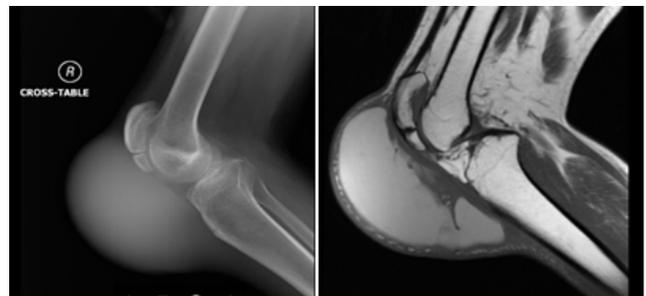


Figure 1: Right knee X-ray- prepatellar soft tissue swelling along with a prior non-united patellar. Fracture and Right knee MRI- large fluid filled bursa with septate cyst formation, and fluid-fluid levels consistent with prior hemorrhage.

Results

Initially yellow blood-tinged then pure blood

- 260 ml aspirate
- Fluid culture (-) for infection or crystals
- 253 ml was aspirated 5 days later
- Left knee subsequently aspirated with similar findings

Comparison before and after: Some of the residual "swelling" is due to the hypertrophied tissue that developed over time.

On ultrasound

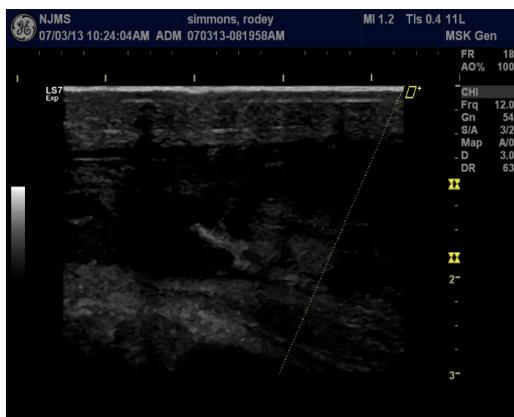


Figure 2: Massive hyperechoic fluid in the prepatellar bursa with synovial tissue within the fluid collection.

Aspiration

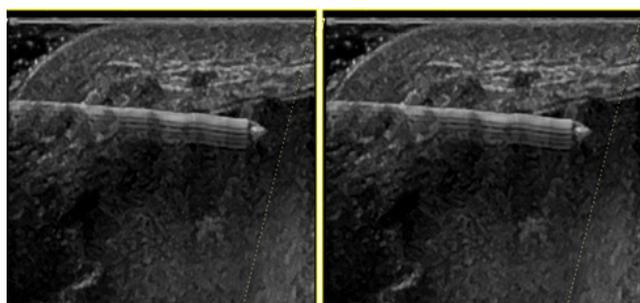


Figure 3: Left- Initial needle entry during procedure, Right- Aspiration begun in superficial most liquid portion of collection. Pockets of serous fluid found within the fluid collection. Septations are also seen.



Figure 4: Left- Before ultrasound guided aspiration, Right- After ultrasound guided aspiration.

Further management

Knee pads to limit compressive and shear forces on the knees when using crawling for household ambulation.

Advised that no blind aspirations should be performed due to risk of draining sinus tract developing from multiple puncture attempts.

Outcome: Patient was lost to follow-up and has not been reimaged at our facility (i.e. x-ray or MRI) from 2013 through 1/17.

Discussion

The prepatellar bursa is situated anterior to the patella and deep to the subcutaneous tissue. Inflammation of this structure may be due to chronic external pressure, particularly in the scenario of frequent kneeling or crawling, often in an occupational setting. This is often referred to as “housemaid's knee” [2]. In this case, due to his cerebral palsy and long-term knee ambulation, the patient developed massive prepatellar bursal effusions because of repeated microtrauma causing inflammation.

The x-ray report of the patient's right knee was notable for a non-united patellar fracture. This type of fracture is commonly seen in cerebral palsy patients with extensor knee disruption. Extensor knee disruption occurs when chronic crouch gait places undue pressure on the patient's patella, leading to a patellar fracture, [3] which likely was the case in our patient.

With regards to the bursal fluid, the E.R. team was not able to aspirate it through using a blind needle approach. The use of ultrasound in our case was vital because it helped with successful aspiration by visualizing the bursal fluid. The extensive overlying hypertrophic skin, subcutaneous tissue and the synovial hypertrophy within the bursa, most likely made blind aspiration very difficult.

Other previously published cases in literature did not utilize ultrasound for diagnosis but instead imaged using plain films and MRIs. In the setting of chronic prepatellar hemorrhagic bursitis, ultrasound might be the preferred imaging modality, as it also allows for real time bursal aspiration. Ultrasound can help confirm fluid filled composition and rule out communication with other bursae and the knee joint.

MRI can have difficulty in distinguishing chronic bursitis if it is complicated by hemorrhage and has low specificity in differentiating Ca^{2+} deposition in the bursal fluid from other calcifying soft tissue masses (e.g. synovial sarcoma) [4].

Although simple bursitis has a well-defined capsule, lesions in chronic bursitis can appear less well defined due to inflammation with edema of surrounding tissues, and this can lead to further ambiguity when interpreting MRIs [4].

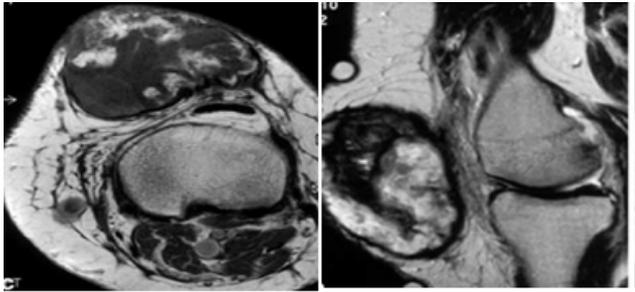


Figure 5: Examples of MRI images that were interpreted as a heterogeneous soft tissue mass, possibly a sarcoma. Subsequent biopsy confirmed chronic haemorrhagic bursitis.

Causes of prepatellar bursitis include chronic/acute trauma, infections and crystal related aetiologies, with yet more diverse aetiologies including sarcoidosis, CREST syndrome, [5] diabetes mellitus, alcohol abuse, uraemia, and COPD [6].

When encountering cases of prepatellar bursitis, potential mimics, which include pannus due to rheumatoid arthritis, synovial sarcoma,

chondroma, subcutaneous cellulitis, and Morel-Lavelle lesion should also be considered.

Conclusion

This case report of chronic prepatellar bursitis is unique due to the use of musculoskeletal ultrasound in helping to confirm the origin of the massive swelling and allowing for accurate aspiration after a failed blind aspiration attempt.

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