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Case Report

Rescuing the knee: arthroscopic extraction of a long-neglected glass fragment: a case report

Anil Kumar Gulia, Sanjeev Kumar, Prabhat Mittal*, Mohit, Rakesh Kumar

Department of Orthopaedics, BPS Government Medical College, Khanpur Kalan, Sonipat, Haryana, India

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***Correspondence:**
Dr. Prabhat Mittal,
E-mail: prabhatmittal28@gmail.com

ABSTRACT

The knee joint frequently encounters penetrating injuries and has ample space to harbor foreign objects. While foreign bodies in the knee joint are unusual, especially those not originating from surgical procedures, extensive literature exists on the extraction of loose bodies and metallic objects from this articulation. However, documentation on uncommon intruders remains scarce. This case study delves into the experience of a 22-year-old male who suffered persistent pain due to a neglected foreign object in his knee joint. After its removal, a complete resolution of symptoms was achieved. It highlights the importance of prompt arthroscopic intervention for optimal outcomes. Here we present a unique case involving a 22-year-old male who underwent arthroscopic retrieval of a neglected glass fragment from his knee joint. The patient sought medical attention five months after the initial injury due to sudden and severe pain onset. Arthroscopy stands as the favored minimally invasive method for extracting foreign bodies from the knee joint, especially from its deeper and less accessible regions. Utilizing pre-operative radiological imaging enhances understanding of the anatomical placement, facilitates surgical orientation, and reduces operation time. A keen sense of suspicion and thorough history-taking are crucial in achieving an accurate diagnosis.

Keywords: Knee joint, Foreign body, Arthroscopy

INTRODUCTION

Foreign bodies frequently find their way into the knee joint, where loose bodies-commonly encountered as free-floating entities-are often retrieved to alleviate persistent knee pain and episodes of locking. While the precise prevalence of loose bodies in the knee joint remains elusive, one study estimates it to be approximately 24.3%.[1] In contrast, external foreign objects like metallic fragments, bullets, or shards of glass are rarer and typically traceable to penetrating traumas. This case study highlights a 22-year-old male involved in a road traffic accident, where a foreign object lodged in his knee joint was discovered five months post-injury.

CASE REPORT

A 22-year-old male presented to our outpatient department complaining of persistent right knee pain for the past five months. His pain worsened during activities such as climbing stairs and other strenuous movements involving deep flexion. Additionally, he reported episodes of knee locking. The patient had sustained an injury to his right knee due to a fall from a bike five months prior, after which he was initially unable to bear weight. He received treatment at a local hospital where wound care was done and radiological assessments diagnosed a soft tissue injury. Despite initial management, his symptoms persisted, prompting him to seek further consultation two days later at another hospital, where the diagnosis remained soft tissue injury.

One month after the incident, although the wound had healed, he began experiencing progressive knee swelling, pain during routine activities, and a sensation of a foreign body inside his knee joint. Subsequent medical advice recommended conservative management for the same. Recently, following a history of self-fall, he experienced

sudden and severe pain in his right knee. Upon presentation to our clinic, the knee appeared normal, with a healed scar measuring approximately 0.5×2 cm on the anterolateral aspect. Clinical examination suggested a lateral meniscus injury and painful terminal knee flexion movements. Further confirmed by radiographs revealed a foreign body within the knee joint (Figure 1).

Figure 1: Plain radiograph of right knee AP and a lateral view showing foreign body in the knee join.

MRI depicted a lateral meniscus tear and edema surrounding the foreign body (Figure 2 A and B). Following thorough anesthetic evaluation, the patient underwent arthroscopic retrieval of the foreign body, with consent also obtained for potential open exploration if necessary. Standard arthroscopic knee portals were established, allowing for diagnostic arthroscopy to identify the foreign body's location and confirm a lateral meniscal tear. A shiny piece of glass entangled in a retro patellar fat pad became prominently visible during the procedure (Figure 3).

The non-mobile particle posed retrieval challenges, necessitating the enlargement of the anteromedial portal incision to approximately 2 cm to facilitate extraction using a grabber. The foreign body, measuring approximately 2 cm by 1.5 cm, was successfully removed (Figure 4 A-C).

After glass removal, a partial meniscectomy was performed using a shaver to address the lateral meniscus tear. Thorough irrigation of the joint was performed, and the portals were closed with sutures. The patient commenced rehabilitation the following day. Postoperatively, he reported complete resolution of symptoms and regained full range of motion. He was discharged the next day with standard post-operative care instructions.

Figure 2 (A and B): Axial and saggital section of MRI of the right knee showing edema around the foreign body and coronal section of MRI of the right knee showing lateral meniscus tear.

Figure 3: Diagnostic arthroscopy showing a glass foreign body in the knee joint.

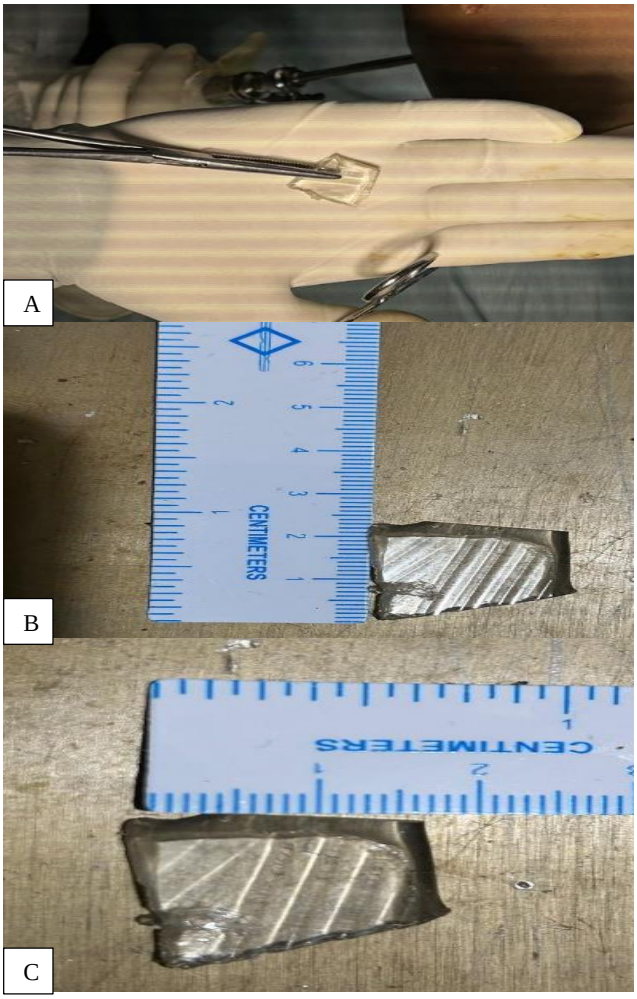

Figure 4 (A-C): Glass foreign body of size 2×1.5 cm which was retrieved from the knee joint.

DISCUSSION

Foreign bodies within knee joint are relatively rare occurrences, often resulting from penetrating injuries/ incidental introductions during surgical procedures like arthroscopy. When situated intra-articularly, these foreign objects can inflict damage on cartilage, meniscus/ ligaments.

This case report underscores the successful retrieval of a neglected glass shard using arthroscopy, the preferred method for foreign body removal in most cases, barring exceptional circumstances. A key takeaway from this case is the critical importance of thorough history-taking, comprehensive clinical evaluation, and the necessity for appropriate imaging modalities, such as radiographs, to guide surgical decisions. While this particular case did not exhibit chondral surface damage as it was entangled in a fat pad, sharp foreign bodies pose a significant risk of such complications, underscoring the need for prompt intervention and meticulous surgical technique.

The literature on foreign bodies retrieved from the knee joint includes a variety of intriguing cases often associated with prior traumatic incidents. Examples range from various other foreign bodies, and bullets, to unexpected items like cactus thorns and even broken probes, and cannula.[2-7] Radiolucent foreign bodies, such as glass particles, pose a particular challenge as they can easily go unnoticed on standard radiographs.

There are few documented cases in the literature that parallel the complexity seen in diagnosing and managing foreign bodies within the knee joint. One such remarkable instance involved the arthroscopic removal of a glass fragment from the knee joint in a patient without any history of preceding trauma or visible scars.[8] Another unique report described a glass foreign body that initially resided outside the joint but migrated intra-articularly over several years, ultimately being extracted arthroscopically through a vent in the posterior capsule.[9] Intriguingly, in another case, a middle-aged patient with osteoarthritis underwent intra-articular injections for pain relief, unwittingly introducing glass particles from fractured vials into the knee joint, necessitating their subsequent removal during arthroscopy. Further illustrating the diagnostic challenges, another case highlighted the arthroscopic retrieval of a glass foreign body initially misdiagnosed as an ACL avulsion fracture on plain radiographs, despite no history of preceding trauma. Mobile and sharp foreign bodies are particularly notorious for causing chondral and ligamentous injuries, as evidenced by a compelling case involving a 13-year-old boy who sustained an incomplete ACL tear due to a glass foreign body, emphasizing the critical need for swift removal to mitigate potential long-term consequences. These incidents underscore the urgency of addressing foreign bodies within joints promptly to prevent serious articular damage.[12]

CONCLUSION

This case report underscores a fundamental truth: even in cases of penetrating trauma, the likelihood of a hidden foreign body remains significant, especially when dealing with radiolucent materials such as glass fragments. Arthroscopy stands out as the preferred method for removing such intrusions in the majority of scenarios. Meticulous exploration of the wound and precise radiological imaging is essential to ensure the complete removal of the foreign body in one operation and to prevent the need for additional surgeries.

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