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## Glass foreign bodies inside the knee joint following intra-articular injection

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### Summary

**Background:**

Foreign bodies inside the knee joint are not uncommon. However, the literature has no reports of a foreign body inside the knee joint, with no history of trauma.

**Case Report:**

Glass foreign bodies were found embedded inside the knee joint during arthroscopic washout for a middle aged male patient with knee osteoarthritis. The patient had no history of trauma and no scars or sign of entry of foreign bodies. It was found that these foreign bodies originated from glass vials broken while withdrawing medication for intra-articular injection of this knee in the past.

**Conclusions:**

To avoid similar incidents, the authors recommend using filter needles to withdraw medications from glass vials.

**key words:**

**osteoarthritis • arthroscopy • knee • glass foreign body • intra-articular injections**

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## BACKGROUND

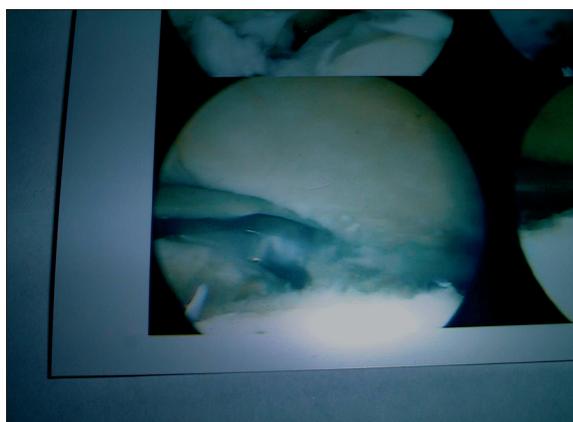
There are several reports in the literature of traumatic entry of foreign bodies into the knee joint. Sharma et al [1] reported a large foreign body in the knee joint following an old injury where the external scar healed well enough to become inconspicuous. The X-ray images mimicked anterior cruciate ligament avulsion. Devgan et al [2] reported an unusual injury where a glass foreign body remained in the subcutaneous tissue for many years and then migrated later into the knee joint. Arthroscopy revealed a circular defect in the posterior capsule, beyond which a 1.6 cm glass foreign body was lying in an extra-capsular location. The late and episodic migration of the glass piece into the joint from its extracapsular location produced acute pain and locking. Migration of a glass foreign body in and out of the knee joint resulted in pain and locking, very similar to a torn meniscus or a chondral lesion. Several authors highlighted the importance of accurate history taking and thorough physical examination for such cases [2,3–6].

## CASE REPORT

A 68-year old man who was known to have osteoarthritis underwent an arthroscopy and washout of his right knee. During arthroscopy, the first author noticed small loose bodies, with glossy surface and unusual appearance (Figure 1). These were removed by arthroscopy, but with difficulty owing to their minute size. The examination of these foreign bodies revealed that they were small pieces of broken glass. The patient denied any history of trauma or foreign body entry to his right knee, but he mentioned that he had a local steroid injection to his right knee before. Steroid and local anaesthetic injection for osteoarthritic knee is a common practice, especially in elderly patients. It is likely that tiny broken pieces from glass vials could be withdrawn unnoticed with the medications.

## DISCUSSION

Glass particles can occur when opening single-use glass ampoules of medication, and injection of these particles has been associated with phlebitis, pulmonary thrombi or microemboli, and end organ granulomas or inflammation [3,6]. Use of a 5 micron filter needle or straw to withdraw medication from the ampoule can reduce the number of particles aspirated [3,6]. Particle contamination of medications obtained from glass ampoules can pose serious hazards to patients. Heiss-Harris et al. [3] mentioned that particle contamination may be reduced by using a filter needle when obtaining medication from glass ampoules prior to administration. Falchuk et al. [7] conclude that infusion-related phlebitis is a pervasive problem in hospitalized patients, and that it is usually caused by micro-particulate components that are present in the infusion fluids, and can be removed by in-line filtration. Preston et al. [4] reported that larger bore unfiltered needles increased the risk of aspirating more glass and other particles than smaller bore or filter needles. These data add further support to the use of filtered needles in administering IM medications to patients who receive ongoing scheduled IM injections. Sabon et al. [5] demonstrated that using drugs supplied in ampoules other than transparent metal etched type and by using filters will decrease the risk of parenteral injection of glass particles.



**Figure 1.** Arthroscopic screenshot showing small glass foreign bodies with glossy appearance.



**Figure 2.** Filter needle.

The filter needle (Figure 2) is a protective device used to prevent contaminants from entering into a syringe, where they could then be injected into the body.

A filter needle places a removable glass filtering device at the base of a syringe needle. The filter creates a one-way flow when withdrawing fluid into the syringe, which runs through 1 filter within the needle, and redirects the fluid through a second filter during injection. Effectively, any medication is filtered both on the way in and out of the syringe [8].

## CONCLUSIONS

To the best of our knowledge, this is the first such case report to be published in the literature. In this case, the patient had no history of trauma and no external or internal scar. The history of intrarticular injection was the only potential culprit. Glass loose bodies inside the knee joint may increase the friction & wear of articular cartilage, leading to or worsening osteoarthritis. We therefore recommend the use of filter needle or non-glass ampoule when withdrawing medication for intra-articular injection.

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