

Case Report

## A Broken Sewing Needle in the Knee of a 4-Year-Old Child: Is it Really Inside the Knee?

Yeung Yeung, M.R.C.S.Ed., Jimmy K. W. Wong, F.R.C.S.(Edin), F.H.K.A.M.(Orth Surg),  
Daniel Kwok Hing Yip, F.R.C.S.(Edin), F.R.C.S.E.(Orth), F.H.K.A.M.(Orth Surg), and  
James K. F. Kong, F.R.C.S.(Edin), F.R.C.S.E.(Orth), F.H.K.A.M.(Orth Surg)

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**Abstract:** We report on a case of a broken needle that migrated inside the knee joint of a 4-year-old girl. Searching for any small foreign body in the knee joint is not easy in either open or arthroscopic procedures. In this case, the surgery was made more difficult because of technical delays and diagnostic difficulties in defining the surgical plane of the needle. Arthroscopic expertise and some basic precautions can minimize the morbidity to a young patient and prevent migration into the knee joint proper. **Key Words:** Needle—Foreign body—Knee—Arthroscopy—Retrieval.

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Searching for any small foreign body in the knee joint is not an easy task. We report on a case of a broken needle end that migrated inside the knee joint of a 4-year-old girl. We describe an unusual chain of events and clues that guided us in its management. Awareness of the difficulties in retrieving the tiny needle end is needed to avoid complication. An image intensifier, arthroscopic expertise, and the availability of smaller arthroscopes are invaluable. Temporary joint immobilization with a splint while waiting for the surgery may be beneficial to avoid intra-articular migration.

### CASE REPORT

A 4-year-old girl complained of right knee pain and became very agitated after playing and rolling on the

bed. However, she could walk normally. Her nanny found a broken piece of a sewing needle on the bed and noticed a puncture wound over the child's right knee. After admission, radiographs of the knee were taken. These confirmed the presence of a metallic foreign body (Figs 1 and 2).

Later after admission, the girl again resisted knee movement and refused to walk at that time. Examination showed a punctured wound just medial to the medial border of the patellar tendon of the right knee. A unusual hospital event delayed surgery until 8 hours after admission. While awaiting surgery, the patient experienced periods of knee pain alternating with periods of extreme discomfort. She was allowed to move as she pleased.

During surgery, an image intensifier showed that the needle tip had migrated to the posterolateral aspect of the knee (Figs 3 and 4). Arthroscopic examination was performed through the standard anterolateral portal using a 2.7-mm arthroscope. An anteromedial portal was also established for probing. Initially, no foreign body was seen in the corresponding area, and whether the needle was intra-articular or subcutaneous was uncertain. However, a capsular punctum was found on the medial side of the knee corresponding to

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*From the University of Hong Kong, Department of Orthopaedics Surgery, Queen Mary Hospital, Hong Kong.*

*Address correspondence and reprint requests to Daniel Kwok Hing Yip, F.R.C.S.(Edin.), F.R.C.S.E.(Orth.), F.H.K.A.M.(Orth. Surg.), University of Hong Kong, Department of Orthopaedics Surgery, Queen Mary Hospital, 102 Pokfulam Road, Hong Kong. E-mail: dkhyip@hku.hk*

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**FIGURE 1.** Initial anteroposterior radiograph corresponding to skin punctum mark, with external paper clip marker.



**FIGURE 2.** Initial lateral radiograph.

the initial painful area. Blood pooling was also seen in the posterolateral corner.

After a gentle external massage was performed over the popliteal fossa, the needle came into view below the lateral meniscus close to the popliteal hiatus. This partially hidden location meant that both the arthroscope and working instrument had to be below the meniscus at the same time. Repeated attempts to retrieve the needle arthroscopically failed because of the small size of the joint. Finally, a small lateral incision was made and the joint was entered submeniscally. The needle end was then removed with a grasper, assisted by the arthroscopic irrigation.

### DISCUSSION

The clinical events of this case were interesting. The fact that the child could initially walk and yet later refused to move her knee suggested that the needle end might have migrated from an initial extra-articular



**FIGURE 3.** Intraoperative image intensifier showed relocation of needle to lateral side of knee. Skin incision needed to be reconsidered.



**FIGURE 4.** Intraoperative image intensifier confirmation of relocation of pin via intra-articular route.

location into the knee joint. A small needle tip in the relatively thick subcutaneous fat planes of a child may be sufficiently bound in this layer to be comparatively painless. The painful episodes may correspond to capsular penetration, subsequent intra-articular irritation, or both. Consequently, had this been realized before the surgery, we may have used immobilization of the knee with a splint before surgery to prevent migration of the needle end into the joint.

Retrieving a moving needle end in the knee joint is not an easy procedure. A foreign body that is superficial initially may later enter deeper planes or the joint itself. The surgeon must be aware the possibility of migration. Difficult retrieval should be anticipated. Appropriate expertise must be used, and instruments such as small joint arthroscopes should always be prepared when the injury is periarticular, even when the foreign body is believed to be subcutaneous. The usual 4.5-mm arthroscope was too large for the submeniscal location in a 4-year-old patient. Had only this size been available, the true location of the needle may not have been identified without significant morbidity.

Establishing whether an object seen in 2-dimen-

sions on an image intensifier is in the knee although it could not be seen arthroscopically is very challenging. At one stage we considered whether the needle had migrated in the subcutaneous plane instead. Had we pursued this suggestion, we would have needed another wound and would have lost time. The fact that a capsular punctum and blood pooling was seen directed the surgeon to preserve the area of the popliteal hiatus. The subsequent milking of that area proved rewarding.

Arthroscopic direct visualization and transillumination of soft tissues are some techniques described to help retrieve foreign bodies from the knee joint.<sup>1-3</sup> Haspl et al.<sup>4</sup> suggested that metal bodies had a tendency to fall into the posterolateral angle of the knee joint probably because of gravity. This observation is supported by this case report because the needle end was found at the posterolateral corner of the knee.

An image intensifier must be used before the incision is made when searching for a radio-opaque foreign body, because it can guide the incision. In this case, it would be completely off the target if the incision were made at the punctured wound. A magnetic probe was considered but was too big to enter the knee. Our past experience with such probes were disappointing because they can only pick up extremely light objects and must be used very close to the object because of the weak magnetic field.

This case emphasizes the importance of attention to preoperative clinical symptoms and events, intraoperative clues, and the judicious use of readily available equipment when trying to localize a target in a 3-dimensional environment.

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