



MIGRATED K WIRE INTO POPLITEAL FOSSA FROM TENSION BAND WIRING OF PATELLA: A CASE REPORT

Orthopaedics

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ABSTRACT

Despite being extensively used, k wires have their own set of complications, with loosening and breakage of these wires being the most significant one of them. We report a case of patella fracture treated with tension band wiring (TBW). After achieving fracture union, patient was lost to follow up. He reported four years later with a broken k-wire which had migrated posteriorly into the popliteal fossa and had to be removed as it was causing symptoms to the patient. We recommend following certain steps to prevent the occurrence of such a complication: following AO principles of fracture fixation, encouraging hardware removal after union of fracture wherever possible, close clinical and radiological follow up to detect the movement, breakage and migration of wires at the earliest and removal of migrated wires on priority basis, irrespective of patient being symptomatic or asymptomatic.

KEYWORDS

broken k wire; migrated k wire; patella TBW; symptomatic

INTRODUCTION:

K-wires are extensively used in fracture fixation. While it is a very convenient implant, it is associated with its share of complications as well. Loosening of wires and their breakage, if retained for a long period of time after fracture union, is a commonly reported complication. Usually patients remain asymptomatic after breakage of wires^[1]. There are even reports of migration of broken k-wires to tissues distant from their primary site of use^[2-9]. We report a case of patella fracture treated with tension band wiring (TBW) where a broken k-wire migrated posteriorly into the popliteal fossa causing symptoms to the patient. To the best of our knowledge, there are just two such reports in English literature^[11,3].

CASE REPORT:

A 56 year old male presented to emergency with history of roadside accident. He complained of pain and swelling over right knee with difficulty in walking. He was not able to do straight leg raising. Patient was evaluated in the emergency room and advised to get an X-ray of his right knee. He was diagnosed to be suffering from fracture patella, which was fixed with tension band wiring and a screw. Patient was on regular follow-up. Fracture united at 9 months with full range of motion but patient complained of prominence of the k wires. Patient was advised implant removal at one year of follow-up but patient was lost to follow up after that. Patient presented to us again after 4 years with pain, occasional restriction of movements and paraesthesia in the right leg. X-rays showed breakage of lateral longitudinal wire and its migration into the popliteal fossa (Figure 1).

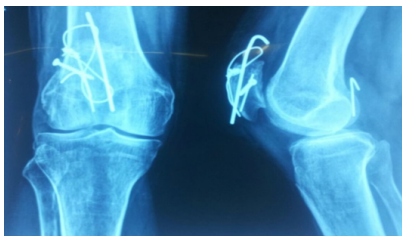


Figure 1: X-rays showing breakage of lateral longitudinal wire and its migration into the popliteal fossa

CT scan was also done to find the exact location of wire before the surgery (Figure 2).

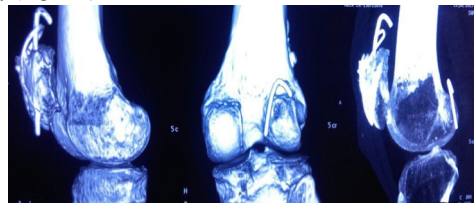


Figure 2: CT scan showing location of migrated wire before the surgery

Surgery was planned for removal of all the hardware. Migrated k wire in the popliteal fossa was in the field of common peroneal nerve which was causing the paraesthesia.

Firstly, with the patient in supine position and using anterior midline incision over the previous scar, most of the hardware was removed but there was a broken k wire in patella which was visible and the broken part of that wire had migrated into the popliteal fossa. We attempted to remove the intra-osseous wire with a bone nibbler but were unable to remove it. Rather, the wire migrated superiorly. This presented as a challenge the wire was loose inside the bone which could not be left as such and could migrate further into the soft tissue. Hence, we made a hole with a k wire and pushed the broken k wire superiorly in a retrograde manner (Figure 3), where it became prominent and was thus removed.



Figure 3: A hole was made with a k wire and the broken k wire was pushed superiorly in a retrograde manner, where it became prominent and was thus removed

The migrated k wire in the popliteal fossa was removed with patient in prone position and through posterior approach to the knee. All the hardware was ultimately removed (Figure 4), as confirmed by immediate post-op x-rays (Figure 5).

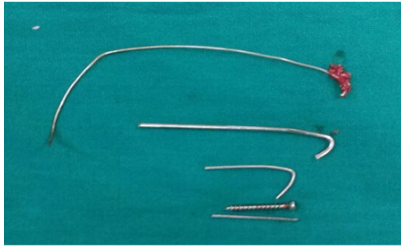


Figure 4: Removed hardware



Figure 5: Immediate post-op x-rays

Post-operative period was uneventful and patient got relieved of paraesthesia immediately after surgery. At current follow up of 24 months after the surgery for implant removal, patient has full and pain free range of motion.

Discussion:

Orthopedic procedures frequently involve the use of k-wires. K-wires are unthreaded; hence have a tendency to migrate. Muscle movements propel free wires along the path of least resistance. There are reports of migration of wires to aorta, heart, thorax, liver, spleen and tendo-achilles from hip, shoulder girdle, sternum and patella^[2-10]. There are just two reports in English literature where a broken k-wire migrated to popliteal fossa in a patient in whom TBW was done to fix patella fracture^[1,3].

Generally, wires back out in a retrograde fashion due to loosening, which could explain the initial movement of intact lateral longitudinal wire in our case just a month after surgery. Repeated stress on the wires due to range of motion at knee joint would have contributed in breakage of wire from a potentially weak spot. Loosening of wire just a month after the surgery suggests that AO principles could not be implemented thoroughly, as in our case the two k wires used were not of same diameter. That is another reason for breakage and migration of k-wires as postulated by Choi et al^[3]. There is a report mentioning about neurological symptoms occurring in a patient due to irritation of CPN (common peroneal nerve) caused by the broken and migrated wire during knee range of motion^[1]. A free wire in popliteal fossa can also cause injury to popliteal vessels and a risk of migration to heart through venous circulation. Hence, proximity of a migrated wire to neurovascular bundle should be an indication for urgent removal. There is the option of using bio-degradable tension band fixation for patella fractures. That will help in averting such complications^[11]. To prevent such complications, certain steps should be followed:

- AO principles of fracture fixation should never be compromised.
- Removal of hardware after union of the fracture should be encouraged wherever possible.
- Patient's activity level should be considered while suspecting migration of broken hardware as increased activity will lead to increased chances of migration of wires due to increased muscle movements.
- Migrated wires should be removed on priority basis irrespective of patient being symptomless.
- Close clinical and radiological follow up is required to detect the movement, breakage and migration of wires at the earliest before patient becomes symptomatic.

Conclusion:

K-wires should be followed up with a high index of suspicion for any possible breakage and subsequent migration as any loose or broken

wire can migrate in the vicinity or at a distant site and cause injury to vital tissues and organs such as neurovascular structures.

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