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"Intra-Articular Intrusion of Broken Patella Cerclage Wire and the Importance of Higher Imaging in Its Rescue" – A Case Report

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Learning Point of the Article:

Patella tension band wiring has been routinely done for patella fractures and has been producing good functional and radiological outcomes. Although rare, there have been instances of implant breakage but what is even rarer is intra-articular migration of the broken fragment. In such cases, higher imaging helps in discerning where the migrated fragment is and also helps in deciding the approach of retrieval, whether to go with arthroscopic or open approach.

Abstract

Introduction: In this case report, we would like to discuss about a 51-year-old gentleman, who had underwent patella tension band wiring for transverse patella fracture 3 years ago and presented with a painful knee with broken cerclage wire with a fragment migrating into the joint.

Case Report: The aim of the study was to highlight the importance of higher imaging (Computed tomography) in deciding whether the retrieval of the fragment can be attempted through a minimally invasive arthroscopic technique.

Result: CT of the knee joint with 3D reconstruction was done and it showed the broken migrated fragment to be intra-articular and intracapsular. Hence, through conventional anteromedial and anterolateral arthroscopic ports, the broken fragment was completely removed with ease, followed by open removal of the remaining cerclage wire.

Discussion: Breakage of patella cerclage wire is rare in clinical practice due to loss of follow-up and migration of the broken fragment is even more rarer with reportedly only six other cases in literature. In similar two cases, without higher imaging, arthroscopic retrieval of the broken fragment was attempted, where in one of the cases it was unsuccessful and they had to convert to an open procedure. Hence, this reiterates the significance of higher imaging to decide on the approach for a functionally better outcome to the patient with less morbidity.

Conclusion: This particular case of broken fragment intrusion into the joint signifies the importance of higher imaging in deciding the surgical approach of its removal in the best possible way without cause higher morbidity to the patient and resulting in better functional outcomes.

Keywords: Patella, tbw, cerclage, wiring, fracture, breakage.

Introduction

Patella fractures are not uncommon and a variety of treatment modalities have evolved according to the fracture pattern. Surgical management is warranted in displaced patella fractures to restore the continuity of the quadriceps apparatus and extensor mechanism. Cerclage wire fixation technique provides flexibility to loop around and stabilize various shapes of the fractured patella with minimal soft-tissue collateral damage. The modified cerclage wiring technique follows the dynamic tension band wire principle and is one of the common methods of fixation for fracture patella [1].

Case Report

A 51-year-old gentleman presented with complaints of deep-

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Author's Photo Gallery


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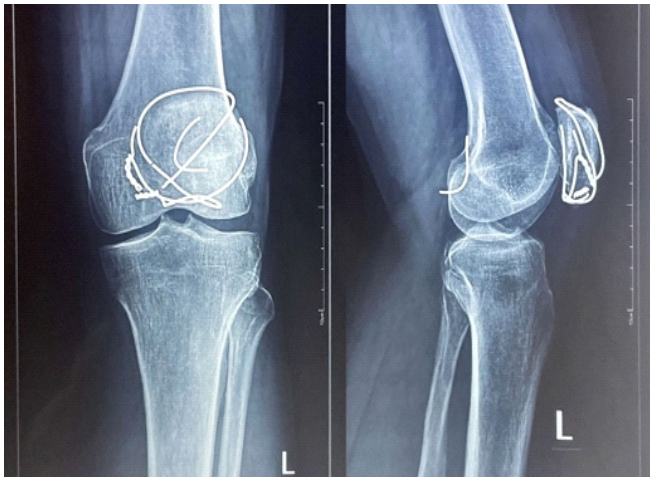

Figure 1: Radiograph of left knee showing the broken patella cerclage wire with a migrated fragment posteromedially.

seated left knee pain over a week duration. His pain was insidious in onset without any history of trauma, fever, or any increased physical activity in recent times. He had surgical fixation of his fractured left patella 3 years prior and fully recovered with normal ADL (activities of daily living) without any pain. On examination, he had a midline healthy, non-tender surgical scar with no joint effusion. Minimal tenderness was present over the posterolateral aspect of his knee joint along the popliteal fossa. His knee range of motion was 0–100° with painful restriction of further active knee flexion. There was no extensor lag and his knee was stable with intact cruciate and collateral ligaments. Vascular status of the left lower limb was also found to be normal with intact peripheral pulses and normal common peroneal knee nerve function.

The orthogonal radiographic views of the left knee (Fig. 1) showed healed patella fracture with broken cerclage wire in situ. The broken posterolateral fragment of the wire seems possibly migrated along the lateral femoral condyle, and the undisplaced broken medial fragment of the wire remained in situ.

He was admitted and a computed tomography of the left knee joint with 3D reconstruction (Fig. 2) was done to discern whether the broken fragment is intra-articular or extra-articular which is the key step to decide the surgical approach.

The CT scan confirmed the extruded fragment to be intra-articular, and hence an arthroscopic assisted retrieval of the broken wire was planned in addition to the open exit of the entire patellar cerclage wire.

Intraoperative findings

After securing the standard anteromedial and anterolateral ports and inserting the scopes, the left knee joint was visualized. The cruciate ligaments were intact and no injuries were noted to both ACL and PCL. The broken piece was visualized behind the ACL (Fig. 3 and 4) in the posterior compartment of the knee and was retrieved in total (Fig. 4). The articular cartilage was inspected for any damages due to the broken piece and no evidence of chondral damage was found.

Intraoperatively, following arthroscopic removal of the broken fragment, an anterior skin incision was made through the previous scar, and the rest of the broken fragments of the cerclage wire were removed. Reconfirmation with fluoroscopic imaging was done before dressing up the knee (Fig. 5).

After uneventful recovery, he was discharged from the hospital in 2 days. His wounds healed and he became pain free with commendable active knee flexion of up to 130°.

Discussion

Breakage of the cerclage wire following patella fracture fixation is not uncommon but distant migration of the broken fragment is rare [2] and intra-articular migration is even rarer [3]. There have been only two cases reported with intra-articular migration of the broken cerclage wire fragment from the patella

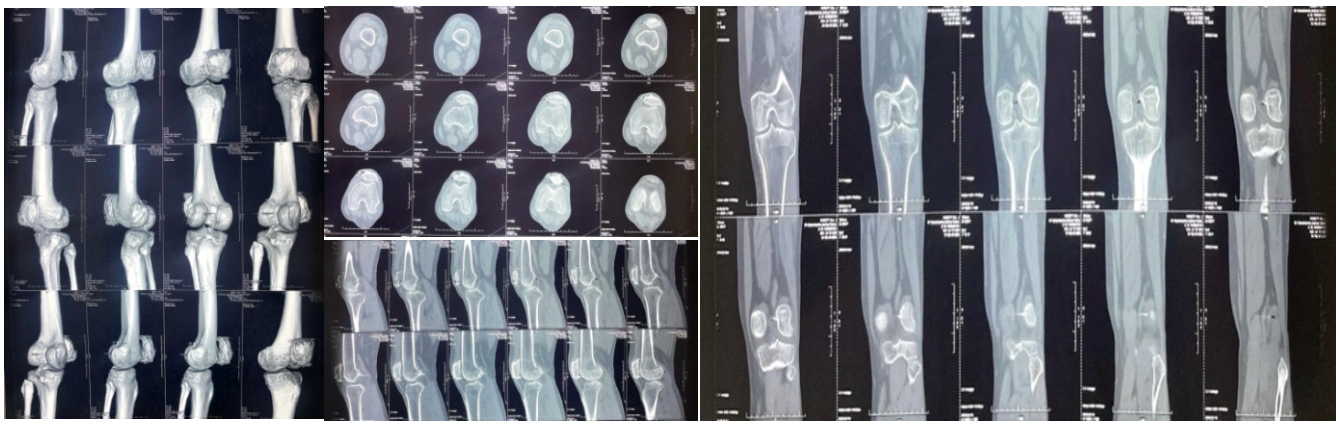

Figure 2: Computed tomography of Left knee showing the broken intruded fragment to be Intra-articular and Intracapsular.

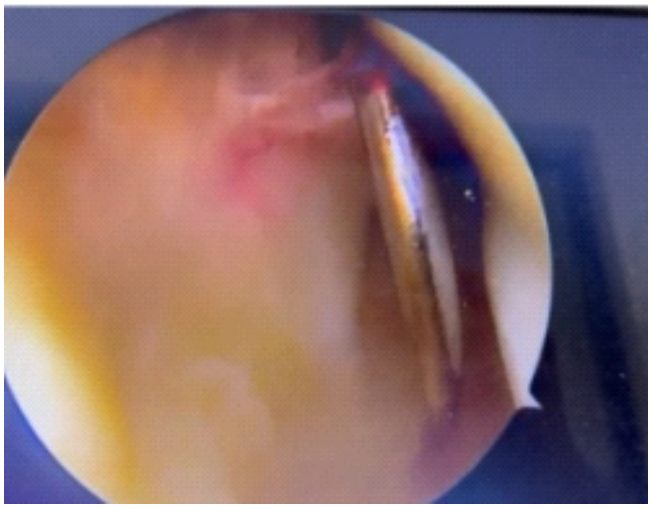

Figure 3: Arthroscopic view of the intruded broken fragment lying behind the anterior cruciate ligament.

Figure 4: Broken Intruded fragment removed in total.

in the literature [4]. Other places reportedly where the broken screw fragment has migrated includes tibia, foot, ankle, and even to the right ventricle of the heart through vascular route [5-7].

Inadequate tensioning principles, active and muscular individuals, and deep-seated cerclage wire within the quadriceps tendon have been some common pre-disposing factors for wire breakage [4]. Long periods after internal fixation with cerclage wiring have also been found to be independently associated with higher risks of wire breakage and migration as evident from a retrospective analysis of 59 post-operative patients with cerclage wiring assessed 79 months after internal fixation with 30 of them showing united fractures with broken wires [2]. Many cases of breakage of cerclage wires have been reported mainly following loss of follow-up and increase interval following osteosynthesis [8-10]. To reduce these complications, several novel techniques, like replacing the K wires with cannulated cancellous screws, have been developed [8]. In case of stellate fracture plate osteosynthesis has evolved, but still the cerclage wire fixation remains a viable salvage option.

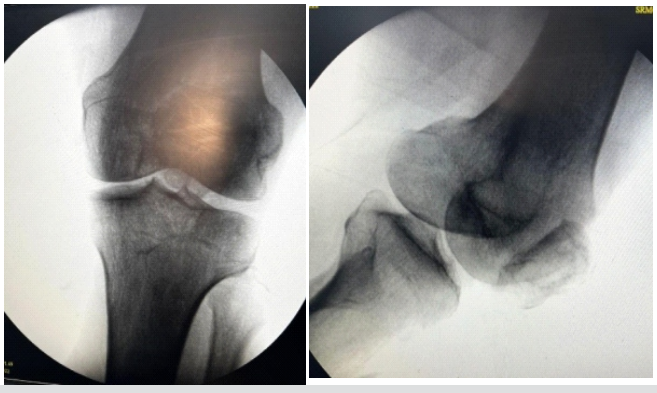

Figure 5: Intraoperative fluoroscopic image to confirm the complete removal of broken patella cerclage wire.

This case report also signifies the importance of higher imaging in deciding the surgical approach. There have been instances where arthroscopic retrieval of the broken fragment has failed and was converted to an open surgical approach [9]. Since in this case, the computed tomography showed the broken fragment to be intra-articular, we opted to retrieve the fragment through arthroscopic approach rather than opening up the posterior aspect of the knee joint which would have higher morbidity to the patient with a safer and an efficient approach readily available supported with radiographic evidence.

Conclusion

Delayed breakage of the cerclage wire fixation in patellar fractures is not uncommon but intra-articular migration is rare. Detailed pre-operative planning with three dimensional images helps to diagnose this rare late complication and plan the surgical approach. Preventive measures with regular follow-up and early hardware removal prevent the possible chondral damage that is likely to occur with intra-articular migrated wire fragment.

Clinical Message

Even though tension band cerclage wiring has been recommended for patella fractures, there have been instances of cerclage wire breakage which can be avoided by explaining to the patient about the need for regular follow-up to prevent this from happening. If uneventfully the patella cerclage wire breaks and migrates, it is always prudent to seek the help of higher imaging to plan for its retrieval.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Conflict of interest: Nil **Source of support:** None

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