

Case report

Disengagement of tibial insert locking pin in total knee arthroplasty - A rare failure case report

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ABSTRACT

Total Knee Arthroplasty (TKA) has seen many advancements over the years. One such advancement is development of locking mechanism for polyethylene insert in modular implants. It aims to reduce micro motion and wear problems. Disengagement of locking pin from insert after primary TKA without trauma is rare complication. The author describes a rare case of disengagement of the polyethylene insert locking pin in primary total knee arthroplasty. Disengagement of the locking clip was observed 8 months after index operation without any trauma.

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1. Introduction

Treatment of degenerative arthritis of knee has evolved over the time. Total Knee Arthroplasty is a well established treatment of choice for advanced degenerative arthritis. As TKA is generally performed on older patients, most of them often have many comorbid conditions. TKA is known to be associated with risk of certain complications and failure.

TKA has seen continuous improvement in component design over the decades. One such improvement is availability of modular components. It has certain advantages over non-modular designs as it leads to increase in flexibility of implant but use of modular components has its own problems like backside wear due to micro motion at interface of tibia component and insert.¹ To counter the problem of micro motion, insert locking mechanism was developed.^{1,2} Disengagement or loosening of polyethylene insert locking mechanism without any trauma is not a common complication but it should always be considered along with other complications as it has its own implications in terms of long term survival of tibia component.

We report a complication of polyethylene insert locking mechanism disengagement in an 8 months old posterior stabilized Total

Knee Arthroplasty in a 62-year-old woman with degenerative osteoarthritis. Patient was operated for TKA both knee in single sitting. Vanguard Biomet implant was used in both the knees. A similar case has been reported in the literature but in that case insert pin failure was seen much earlier (around 6 weeks).²

2. Case report

A 62 year old female patient was diagnosed with Degenerative Osteoarthritis both Knee. Patient was planned for Total Knee Arthroplasty and was operated in single sitting in April 2019. The procedure was uneventful. The patient was allowed weight bearing next day with support and physiotherapy was started. Patient was discharged after 5 days under satisfactory condition. Rehabilitation process was also uneventful and patient achieved full knee range of motion. After 8 months of index surgery patient had pain on medial side of right knee. Patient had no history of trauma to the knee. On examination patient had complete range of motion but had swelling over medial side of right knee. X-rays showed disengagement of locking pin of insert from tibia component (see Fig. 1). Routine blood investigations were normal. Inflammatory parameters were also normal. Patient was planned for arthrotomy and exchange of locking pin. Routine midline skin incision was given and joint was opened. Locking pin was found to be disengaged and lying free on medial side after piercing soft tissue (see Fig. 2). Femur and Tibia components and polyethylene insert were well fixed.

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Fig. 1. Immediate post operative X-rays.



Fig. 3. Intra operative picture showing medial migration of pin.

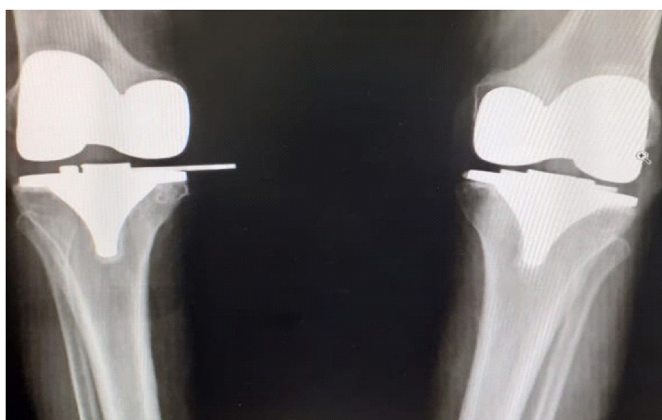


Fig. 2. X-rays showing disengagement of locking pin of right knee.



Fig. 4. Post operative x-rays showing correct pin placement.

There was no soft tissue impingement between insert and tibia component, but insert was removed and exchanged precautionary. Pin was also removed and exchanged. Intra operative Fluid and tissue sample was taken for culture and sensitivity testing. Check x-rays was done next day for confirmation of new locking pin position (see Fig. 3). Post Operative period was uneventful. Cultures were sterile. Patient is currently under follow up and is doing well. Implant company representative was contacted and extracted implant was shown but according to company there was no defect in insert locking function. So company was not sure of the reason for this complication (see Fig. 4).

3. Discussion

Modularity has certain advantages in form of ease of exchange of polyethylene insert in case of infection or osteolysis. Availability of modular components helps to make intra operative modifications during tibia tray placement. It also helps to provide better access to posterior of knee in case of cement extrusion.

Modularity of components also as its own complications like possibility of micro motion between insert and tibia base plate which further can lead to backside wear. Backside wear due to micro motion can generate biologically significant particles that lead to synovitis and osteolysis.⁶ This micro motion could be due to deterioration of the locking mechanism after implantation.⁷ Metal-backed tibia components have shown an increased incidence of

osteolysis when compared with all-polyethylene tibia designs.⁸ If not recognized early it can lead to many complications like loosening of components and need for revision. Some authors reported modular tibia also serves as a nidus for infection as it creates interface between insert and metal tray.¹⁰

Locking mechanism for polyethylene insert was developed to reduce the problem of interface micro motion and backside wear in modular implants. Studies suggest that peripheral polyethylene locking mechanism has better performance in preventing micro motion as compared to central polyethylene locking mechanisms.⁹

Disengagement of locking mechanism of the insert has been reported in revision total knee arthroplasty^{3,4} but disengagement of locking clip from insert is very rare after primary total knee arthroplasty that too without any trauma. Polyethylene insert failure from the tibia base plate has been reported more frequently after mobile-bearing and cruciate-retaining Total Knee Arthroplasty.⁵ Locking mechanism failure can lead to subluxation or dissociation of the polyethylene. In our case there was no

subluxation or dislocation but only locking mechanism failed and pin migrated to medial side.

In our case there was no fall or trauma. Intra operatively there were no macroscopic signs of damage to locking pin or insert. Possibility of soft tissue interposition between locking pin and insert seems to be rare as surgeon ensures to retract all soft tissue away during pin placement in every case. Exact cause of locking pin failure could not be ascertained.

4. Conclusion

Although disengagement of locking pin from insert is not a common complication but it should be considered in patients presenting with pain and swelling of knee after Total Knee Arthroplasty as it can lead to dislocation of insert and early revision. Definitive cause of disengagement of pin in our case could not be ascertained but according to author it could be due to soft tissue interposition between pin and insert during primary surgery or could be due to some trauma that patient did not disclose in history. Author suggests that intra operatively surgeon should always ensure to remove any soft tissue between pin and insert due locking. Post operatively patients should mobilize under supervision to prevent fall as that can lead to damage to implant components.

Declaration of competing interest

The authors declare that they have no known competing

financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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