

Broken Guide Wire Removed Laproscopically- An Unusual Presentation and Treatment of A Known Complication of Intertrochanteric Fracture Surgery

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Abstract

Introduction: Fixation of hip fracture is a routine surgery in orthopaedic practice. At times certain unusual complications happen during this procedure. We report one such unusual complication.

Case report: A 49 year male presented with type II Tronzo's intertrochanteric fracture. A dynamic hip screw (DHS) fixation was planned through lateral approach. Once the reduction was achieved a derotation guidewire was inserted in the superior quadrant of the neck. The main DHS guide wire was inserted into the posterior and inferior quadrant and position was confirmed under image intensifier. Drilling was done over the guidewire, however the image intensifier image after drilling showed that the guide wire was migrated far beyond the femoral head into the hip joint and beyond. The patient was haemodynamically stable and general surgeons were intimated. Fracture fixation was completed meanwhile preparation for laparoscopy was done. The guide wire tip was 1 cms away from large intestine but had penetrated the peritoneum without any severe injury to abdominal or pelvic viscera. As most of the guide wire was intra-pelvic, it was meticulously pulled out through a separate portal made neat the right Iliac crest successfully. Patient was stable throughout both surgeries and fracture healed without any complications.

Conclusion: guidewire should be checked before every use and image intensifier should be used intermittently during drilling over guidewire. In event of migration of wire, make sure that wire is not broken and take help from laparoscopy colleagues.

Keywords: Guide wire migration, Intertrochanteric Fracture fixation, abdominal laparoscopy

Introduction

Implants for Hip surgery includes Gamma nails, Dynamic Hip Screw, Proximal Femoral nail cannulated screws and so on. All these implantations have threaded guide wires as an indispensable part. Care must be taken to avoid any iatrogenic complications related to guide wire during the surgeries. Complication like broken guide wire, intra-pelvic migration of guide wire, iatrogenic neuro-vascular or visceral injury due to migrated guide wires are rare

but documented [1,2]. Removal of such broken/migrated guide wire in Hip surgery is an nightmare for the operating surgeon as it becomes an cumbersome surgery and can be fatal to the patient [3,4].

Here we report one such complication with guide wire migrated intra-peritoneally into abdominal cavity removed successfully with laproscopic surgery.

Case report

A 49 year old male with history of Road

traffic accident sustained Tronzo type II inter-trochanteric fracture femur with no other injuries or co-morbidities. Patient was operated under spinal epidural. Reduction of fracture fragment was done on fracture table and plan was then to do closed reduction and internal fixation using Dynamic Hip Screw by standard lateral approach. One derotation guide wire was inserted in superior quadrant of head. Then Guide wire for Dynamic hip screw was inserted in posterior and inferior quadrant

of head not transfixed to acetabulum. It was accepted and drilling commenced. Prior to reaming C-Arm shoot was taken. The guide wire was seen migrated far beyond

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Figure 1: Radiograph showing Migration of wire n peritoneal cavity

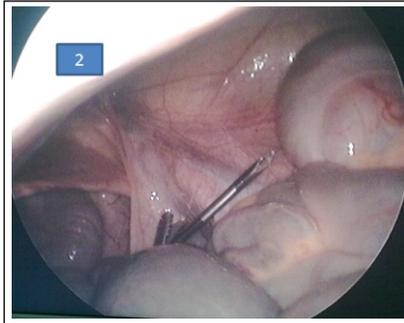


Figure 2: laparoscopic image showing position of guide wire in the abdominal cavity

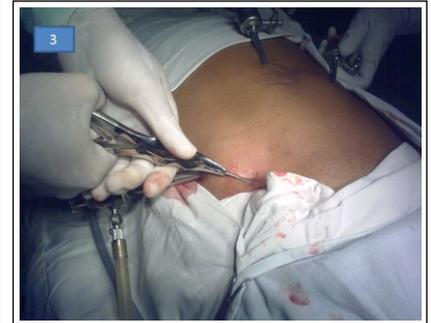


Figure 3: Removal guide wire via separate incision over peritoneum

the femoral head at the edge of acetabulum. All the attempts were done to remove the complete guide wire but it had migrated beyond the femoral head in the joint without breakage as visualized on C-arm shoots. Patient was vitally stable. Dislocation of the joint or opening the joint by anterior or posterior approach would have been futile as guide wire had migrated way beyond. Decision was then taken to take an opinion of general surgeon intra-operatively. Intra-operative Portable X-rays were taken (Fig 1). General surgeon advised us to finish our surgery as he planned to do a Diagnostic and Therapeutic Laparoscopy. General Surgeon had suspected that guide wire tip was intraperitoneal intrapelvic near the large intestines. Relevant consent was taken from patient and his relatives, intra-operatively after explaining the situation. Orthopaedics procedure was finished and Abdominal Laparoscopy commenced. As Suspected the guide wire tip was 1 cms away from large intestine but had penetrated the peritoneum without any severe injury to abdominal or pelvic Viscera (Fig 2). As Most of the guide wire was intra-pelvic, it was meticulously pulled out through a separate portal made neat the right Iliac crest successfully (Fig 3). Patient through-out the surgery and post-operatively was stable and there was no major injury to any viscus and fracture united well in due course of time. Video shows laparoscopic removal of guide wire.

Discussion

Intrapelvic migration of guidewire is unusual complication. In this situation the wire may break or remain intact. There have been many reasons postulated for guide wire breakage [5]. Few of them are-

1. Stress caused to guide wire from the lever effect during reduction.
2. The tip of the guide wire being

threaded, it might get entrapped in the vertical compression belt of the right femoral neck.

3. A mechanical weak point exists between the threaded tip and the non-threaded part.

4. Repeated use of the same guide wires may lead to deformation and decrease torsional strength.

There have been various methods of removal of Broken guide wire. Making a bone window, endoscope, arthroscopy, converting to total hip replacement are some of the methods of removing such broken guide wires [6,7]. In our case guide wire had migrated but not broken. It is very essential for the surgeon to check the status of guide wire pre-operatively and not to manipulate the fractured fragments once fixed with guide wire. Sayegh et al [4] reported a complete intrapelvic migration of the threaded guide pin, which remained unnoticed during operation without any visceral damage. It was later removed by laparotomy. Similarly, Sen et al [8] reported 4 cases of K-wire and guide pin removal in peritrochanteric fracture fixation. They used a Smith-Peterson and Watson-Jones approach for 2 cases without pelvic penetration and lateral window of ilioinguinal approach for the other 2 cases with guide wire penetration into pelvis. They postulated that pin breakage is more common in young patients with dense bones and concluded that the approach to remove the pin depends on its location and preoperative radiograph, computed tomography scan, and computed tomography angiography when needed. In another similar case report quoted by Papnilolau et al [9] reported an 89-year-old female patient with an intertrochanteric fracture of the left hip, who underwent intramedullary osteosynthesis with a gamma nail. Four days later, radiologic

examination identified that the guide had not been removed during the operation and had migrated into the peritoneal cavity. Ultrasonography and CT scanning failed to confirm intraabdominal or vascular injury. Although the guide wire was removed through the initial incision. Urgent investigative laparotomy revealed dilation of the small intestine, perforation of the mesosigmoid and mesorectum which required small bowel wall debridement and suture-closure. Fortunately in our case though the entire guide wire had migrated intrapelvic, it did not injure any viscera or vascular structure and was successfully removed by laproscope.

Mishra et al [3] described two cases of penetration of guide wires in the pelvic cavity in hip surgery and proposed some recommendations to avoid this kind of complication: 1) Observe the cleanliness of the cannulated orifice of the drill and of the plugs; 2) Avoid reuse of the guide wires; 3) Use cannulated instruments from the beginning to the end of surgery; 4) Perform radiological monitoring throughout the surgical procedure.

Any penetrations that may occur beyond the quadrilateral plate should be measured, either by what remained of guide wire in the femoral lateral cortical, or by means of radiological control. In our case The wire appeared to be tras-acetabular, near bowel loops. Most importantly laproscopically it was very difficult initially to remove the guide wire as it appeared as a shiny object as it reflected the light of scope directly. Iliac-vessels, Ureters in retroperitoneum and bowels such as rectum, sigmoid colon are prone to injury. As this wire has not pierced peritoneum, identification tras-peritoneally was important. Many vital structures are around here and hence laparoscopy was done very carefully in our case.

Care must be taken to avoid migration or breakage of guide wire and below mentioned points must be considered-

1. The guide wire should not surpass the quadrilateral plate in hip surgeries under risk of injuring neurovascular structures and the large intestine;
2. Preventative measures such as use of the image intensifier are of vital importance to reduce both the occurrence of penetration of the guide wire in the pelvic cavity and the severity of lesions associated with such a complication;
3. In cases of inadvertent pelvic penetrations with centralized guide wire and positioning of the operated limb in traction, abduction and internal rotation, the score and the medical management proposed should be carefully adopted.

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Conflict of Interest: Nil
Source of Support: None

How to Cite this Article

Pathak AC, Shah K, Shahane SM, Samant A, Kamath MM. Broken Guide wire removed Laproscopically- An unusual Presentation and treatment of a known complication of intertrochanteric fracture surgery. *Journal of Orthopaedic Complications* Jan-April 2016; 1(1):8-10.