



A technique to remove a broken guide wire transfixing the hip joint

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A broken guide wire while operating on hip is one of every surgeon's most dreaded nightmares. We report here a method which was used successfully to retrieve a broken guide wire from a patient who was being operated for core decompression and fibular grafting for avascular necrosis of the femoral head.

Keywords : guide wire ; breakage ; hip joint ; removal.

INTRODUCTION

Cannulated instruments are usually used while operating around the hip joint for fractures or other pathologies. Threaded guide wires are routinely used for localizing the position of various fixation devices. There have been reports of intrapelvic migration of guide wires which have been retrieved with extraperitoneal approach (1,3) and by making a window in the neck of the femur while operating on the hip joint (2). We faced a situation in which the guide wire migrated and broke while reaming over it in a case of avascular necrosis of the femoral head. We used the instrument responsible for guide wire breakage to retrieve the broken piece of wire.

CASE REPORT

A 29-year-old female patient with bilateral idiopathic avascular necrosis of the femoral head was scheduled for core decompression and fibular grafting. A guide wire was passed through the lateral cortex into the most affected region of the head. The guide wire was passed till the subchondral

bone of the head in the lytic region so as to enable reaming till there. The aim was to give mechanical support by a fibular strut graft in the defective part of the head.

The dynamic hip screw reamer was used to ream over the guide wire under image intensifier control (antero-posterior view). After the initial ease the reamer failed to progress. The reaming was continued under the misconception that difficulty was due to sclerotic femoral head. On continued failure to ream, a lateral view from the image intensifier was taken and erosion of the guide wire was seen in this view. The wire was also seen to migrate through the head into the acetabulum. The guide wire was transfixing the hip joint but had not entered the pelvis. A gentle attempt to retrieve the wire led to fracture of the wire at the site of erosion (fig 1).

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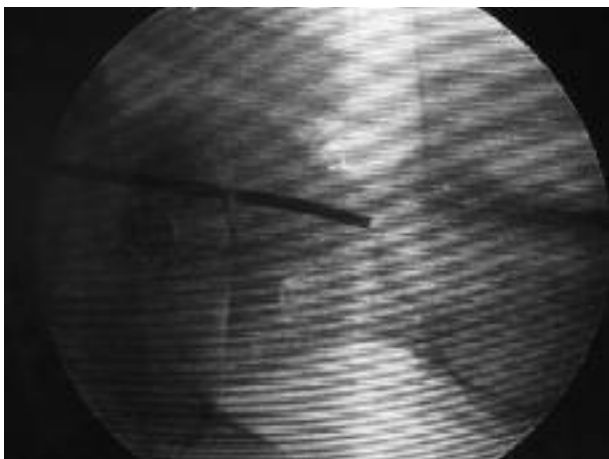


Fig. 1. — Broken guide wire in lateral view.



Fig. 2. — Broken guide wire being retrieved with the dynamic hip screw tripple reamer.

Various attempts to remove the wire with hand held instruments through the hole drilled in the lateral cortex failed. The broken end of the wire was cleared with the help of a small curette. The dynamic hip screw reamer was once again threaded over the broken guide wire under image intensifier and was advanced till the beginning of the threads of the guide wire which were just beyond the head of the femur, with the help of a hand drill. Once the threads were engaged the broken piece of wire was easily removed by withdrawing the reamer (fig 2 and fig 3).

DISCUSSION

Intrapelvic migration and breakage of a guide wire are rare complications of hip surgeries. There are few reports in literature (1,3). These problems mainly arise from reuse of the wires, which are meant for single use. The multiple use leads to decreased mechanical strength and to bending of these wires. Reaming is done with the help of straight cannulated drill bits or reamers. There is every chance that it may lead either to migration of the wire or its breakage or both of these, as happened in our case.

A wire which has migrated into the pelvic cavity can be retrieved with the help of an extraperitoneal



Fig. 3. — Broken wire with threads engaged in the dynamic hip screw reamer.

approach (1,3). In our case the wire was just engaged in the acetabulum and did not enter the pelvis, so removing the wire by extraperitoneal approach was not possible.

While using cannulated devices in hip surgeries, surgeons many times come across the inadvertent removal of the guide wire. It happens while reaming, drilling or tapping. This in our opinion happens whenever one crosses the threads of the wire. This can be explained on the basis of the following two reasons.

Firstly, whenever one drills the threaded guide wire through the bone of the proximal femur, the effective diameter of its proximal part i.e., the threaded portion of the wire increases by deposition of bone debris in the threads. The same effect can be seen while tapping or drilling the holes when one sees bone debris in the threads of the tap or drill bit, which have to be cleaned frequently. Secondly, the effective diameter of a cannulated device also decreases while reaming or tapping due to bone debris deposition in the lumen of the device. Both these factors combined lead to engagement of the threaded proximal part of the wire in the cannulated device and removal of the wire while withdrawing the device many times. We used this knowledge as a technique to remove the broken wire in our case.

In this case we could afford to go till the articular cartilage of the head of the femur since a lytic lesion was there and the articular cartilage was already damaged due to hip pathology. Our plan was to support the defective head of the femur with a strut fibular graft. In our opinion this method can be safely attempted when confronted with a broken guide wire with threads within the head of the femur and engaged in the acetabulum if the location of the wire is in a non weight bearing area of the femoral head. Threading the triple reamer over the broken piece of guide wire needs patience and may require some cleaning of bone around the end of the wire as we did with help of a small curette. However, it is a matter of discussion how much damage the dynamic hip screw reamer (diameter 8 mm) or cannulated drill bits (diameter 4.5 and 3.2 mm) will cause to the head of the femur in its weight bearing area.

One also has to consider the other published method of removal by opening the hip joint and

making a window in the neck of the femur (2). This method is not without hazard of damaging the blood supply of the head of the femur. Moreover to pull out a straight threaded wire with the help of a plier needs a large window. It seems no less traumatic a procedure and can lead to weakening of the neck and head. Dislocating the hip is impractical if the guide wire has engaged in the acetabulum. It can lead to further breakage of the guide wire apart from damaging the blood supply of the femoral head.

If one is using powered instruments one should frequently check both views, anteroposterior and lateral, if a cannulated device is not progressing because of eccentric reaming. We made the mistake of reaming under continuous anteroposterior view image intensifier control only, while we should have checked the lateral view also. Frequent intra-operative removal and cleaning of the lumen of the cannulated device has also been suggested.

This method according to us is worth a try for removal of a broken guide wire within the head of the femur or engaged in the acetabulum. Even if it fails we are left with other options of removal of wire without causing much anatomical damage.

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