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Case Report

Intrapelvic Migration of Dynamic Hip Screw Postoperatively Leading to Total Hip Arthroplasty: A Case Report

Mir Mansour Moazen Jamshidi[1], Alireza Moharrami[2], Pouya Tabatabaei Irani[2], Mohammad Ali Ghasemi[1], Amir Reza Mafi[3], Seyed Mohammad Javad Mortazavi[4,*]

[1] Hip and pelvic Surgery Fellowship, Joint Reconstruction Research Center, Tehran University of Medical Sciences, Tehran, Iran
[2] Resident, Department of Orthopedic Surgery, Joint Reconstruction Research Center, Tehran University of Medical Sciences, Tehran, Iran
[3] General Practitioner, Joint Reconstruction Research Center, Tehran University of Medical Sciences, Tehran, Iran
[4] Professor, Department of Orthopedics, Joint Reconstruction Research Center, Imam Khomeini Hospital Complex, Tehran University of Medical Sciences, Tehran, Iran

[*]Corresponding author: Seyed Mohammad Javad Mortazavi; Department of Orthopedics, Joint Reconstruction Research Center, Imam Khomeini Hospital Complex, Tehran University of Medical Sciences, Tehran, Iran. Tel: 21-66581586, Email: smjmort@yahoo.com

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Abstract

Background: This study aimed to present a rare case of a failed dynamic hip screw (DHS) used for fixation of intertrochanteric fracture sliding into the pelvis and to review the most common causes of DHS failure in order to prevent this from happening in the future.
Case Report: A 68-year-old woman was referred to the orthopedics clinic with left hip pain and limping from 6 months ago. In our evaluation, she had DHS failure and intrapelvic protrusion.
Conclusion: There have been several aspects of the previously described DHS failure. We performed a two-stage total hip arthroplasty (THA) for the patient with a good one-year follow-up in the present case.

Keywords: Equipment Failure; Bone Screws; Hip Fractures; Total Hip Arthroplasty

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Background

Hip fracture is still the most common reason for admitting an elderly to the orthopedic emergency ward (1, 2). They are often suffering some degree of osteoporosis, and the variety of treatment methods available shows the difficulties in managing these injuries (3). These fractures are categorized into two groups of intracapsular and extracapsular fractures (2). Almost half of the hip fractures are extracapsular such as intertrochanteric fractures, which are mainly fixed by a dynamic hip screw (DHS) or an intramedullary nail (IMN) (1). However, several studies have concluded that sliding compression screws may be associated with serious complications such as perforation of the femoral head, loss of reduction caused by excessive sliding of the lag screw, non-union, shortening of the affected limb, and pain (4-6).

Fixation of an intertrochanteric fracture is achieved through several steps, starting by reduction under x-ray control, and then using a k wire to stabilize the reduced part and guide the cephalic screw to take in the place, followed by placing the DHS plate and fixing to the femur diaphysis by some other necessary screws. Failure in any of the latter steps and the patient's medical condition, such as osteoporosis, may be the common causes of DHS failure in these patients. There have been several complications of perioperative DHS fixation; however, there have been only three case reports regarding intrapelvic sliding of cephalic screw preoperatively and some other postoperative intrapelvic DHS failures (7-9).

This study aimed to present a rare case of failed DHS used for fixation of intertrochanteric fracture sliding into the pelvis and to review the most common causes of DHS failure to prevent this from happening in the future.

Case Report

A 68-year-old woman was referred to the orthopedics clinic with left hip pain and limping from 6 months ago. She had a history of left femur intertrochanteric fracture due to falling which was fixed by DHS about 6 months ago, followed by removal of DHS due to device failure about 2 months later (Figure 1). She had a history of diabetes mellitus and was using metformin and gliclazide. There was no specific family history of chronic disease.

Figure 1. The intertrochanteric fracture (Left) fixed by a dynamic hip screw (DHS) (Right) 2 years ago

In clinical examination, the patient had a fully restricted active and passive range of motion (ROM) of the left hip along with pain in the internal and external rotation.

Our workup started by plain radiography, which showed previous DHS failure of intertrochanteric fixation and intrapelvic protrusion of the device and dynamic screw, which was removed and there was nonunion of intertrochanteric type A.3 fracture in AO classification, which was a candidate for total hip arthroplasty (THA) (Figure 2). The infection was ruled out by hip aspiration and negative results.

Figure 2. The dynamic hip screw (DHS) intrapelvic protrusion

The patient underwent a two-stage THA because of acetabular deformity, device failure, and protrusion into the pelvis. In the first surgery, the DHS was removed and in the second surgery, a THA with Wagner SL Stem (Zimmer, Warsaw, IN, USA) and Continuum Acetabular cup (Zimmer, Warsaw, IN, USA) was performed for the patient with direct anterior approach (Figure 3). The patient regained her hip ROM, and her pain went away during the 12-month follow-up.

Figure 3. In the first stage, the dynamic hip screw (DHS) had been removed, and infection was ruled out (Left), and in the second stage, total hip arthroplasty (THA) was performed for the patient with a long stem (Right).

Discussion

Hip intertrochanteric fractures are commonly seen in the elderly, especially in association with osteoporosis and minor trauma to the hip (2, 10) and are preferred to be fixed by a DHS device. Several intraoperative and postoperative failures of DHS have been reported (1, 2, 7-9). The most intraoperative complications were malassembly, tearing and migration of the guidewire into the pelvis, migration of the compression screw, and intrapelvic vascular injury caused by the guidewire. Other leading causes of postoperative DHS failure were suggested to be the use of the mallet to fit the plate on the screw, over-reaming the femoral neck and head before engaging the plate on the screw, and bone insufficiency (7-9).

Previously, few reports have been released regarding the failure of DHS, which rarely happened in an intrapelvic manner or acetabular protrusion. Some of them have happened intraoperatively, as reported by Singh et al. (7) and by Naidu et al. (9), who reported 2 cases of intrapelvic migration of DHS due to intraoperative mismanagement or osteoporosis of the patients.

Larsson et al. studied 607 cases of intertrochanteric fractures fixed by DHS, of who 23 (7.4%) were reoperated, 17, 3, and 3 respectively because of technical complications, infection, and nonunion (11).

Some others reported postoperative intrapelvic protrusion of DHS. The study by Moreyra et al. reported a rare case of late vascular injury to the external iliac vein after 4 months due to acetabular penetration of sliding hip screw, which led to a retroperitoneal hematoma, and the patient died two days after (12). Besides, Bhatti and Abbasi presented their first rare case of intrapelvic DHS migration in a patient presenting with hip pain and stiffness and abdominal pain 3 months after internal fixation of hip fracture by DHS (13), which was previously reported by Brodell and Leve (14) and by Joseph (15).

To the best of our knowledge, there are very rare reported cases of intrapelvic migration of DHSs. In the present study, we presented one of the rare cases of acetabular protrusion of DHS 3 months after fixation of intertrochanteric fracture of left hip that was then a candidate for THA, and the patient regained her hip ROM and function during follow up.

Conclusion

There have been several aspects of DHS failure described previously such as technical errors, lack of experience in fixing intertrochanteric fractures, and osteoporosis of the bony structure, which are the most important causes of device failure and the following hip arthroplasty. We performed a two-stage THA for the patients with a good one-year follow-up in the present case. THA would be an occasional option for the elderly patients with hip device failure.

Conflict of Interest

The authors declare no conflict of interest in this study.

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