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Dynamic Hip Screw with Derotation Screw In Neck of Femur Fractures

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Abstract

Background: Fracture of the neck of the femur remains a challenging injury due to risks of non-union and avascular necrosis. In young and physiologically active patients, internal fixation is preferred to preserve the native femoral head. Dynamic Hip Screw (DHS) fixation provides controlled compression at the fracture site; however, rotational instability of the femoral head during and after fixation may adversely affect outcomes. Supplementation with a derotation screw has been advocated to enhance rotational stability.

Objectives: To evaluate the functional and radiological outcomes of fracture neck of femur treated with Dynamic Hip Screw fixation supplemented with a derotation screw and to assess associated complications.

Materials and Methods: This prospective study included patients with fracture neck of the femur managed with DHS and an additional derotation screw. Patients were followed up at regular intervals with clinical and radiological assessments. Fracture union, implant position, and complications such as non-union, avascular necrosis, and implant failure were documented. Functional outcome was assessed using a standard hip scoring system.

Results: In a total of 20 patients, fracture union is achieved in 19 patients (95%) of the patients, with a mean union time of 15 weeks. According to the Harris Hip Score, Functional outcome showed excellent to good results in 15 patients (75%) with a mean HHS of 86. Complications were observed in 10% of the patients, which included non-union in 1 patient (5%) and avascular necrosis in 1 patient (5%). Better functional and radiological outcomes were noted in Garden II & III fractures compared to Garden IV. DHS with a derotational screw provided improved rotational stability with no incidence of implant failure.

Conclusion: Dynamic Hip Screw fixation supplemented with a derotation screw is an effective and reliable method for managing selected fractures of the neck of femur. The technique provides enhanced rotational stability, satisfactory union rates, and favourable functional outcomes with minimal complications.

Keywords: *Fracture neck of femur, Dynamic Hip Screw, Derotation screw, Internal fixation, Functional outcome.*

INTRODUCTION

Fractures of the neck of the femur remain a significant challenge due to their **high morbidity** and **risk of fixation failure**.

Complications like **avascular necrosis, collapse of the neck** and **sheer stress** pose a significant challenge in treating these fractures.

The Dynamic Hip Screw (DHS) has long been a standard implant for stable fracture patterns; rotational stability of the femoral head remains a concern.

The addition of a **derotational screw aims to improve rotational control** and **enhance fracture stability**.

AIM

To evaluate the **functional and radiological outcomes of Dynamic Hip Screw fixation with derotational screw** in the treatment of **neck of femur fractures**.

OBJECTIVES:

1. To assess the **rate and time of fracture union** following DHS with derotational screw fixation
2. To evaluate the **functional outcomes** using the **Harris Hip Score** at regular follow-up intervals
3. To determine the **incidence of complications** such as non-union, avascular necrosis, and implant failure.

INCLUSION CRITERIA

- Adult patients (18 - 60 years)
- Post-traumatic neck of femur fractures.
- Garden type II-IV / Pauwels type II-III fractures.

EXCLUSION CRITERIA

- Pathological fractures
- Old neglected or non union fractures
- Associated ipsilateral lower limb injuries

SURGICAL TECHNIQUE

- Patient in supine position on fracture table with traction and internal rotation.
- Closed reduction under C-arm (check AP and lateral views)
- Standard lateral approach to the proximal femur.
- Guidewire inserted for DHS lag screw placement through the inferomedial part of the femoral head.
- Guide wire passed superior and parallel to the first guide wire.
- DHS lag screw inserted over the inferomedial guidewire after reaming.
- Derotational screw (cannulated cancellous screw 6.5mm) placed superior and parallel to the DHS lag screw over the second guide wire.
- Both screws advanced 10mm short of the subchondral bone.
- Side plate applied and fixed with cortical screws to the femoral shaft.
- Final reduction and fixation checked under C-arm (AP and lateral).

POST OPERATIVE PROTOCOL

- Quadriceps and ankle exercises from post-operative day 1
- Non-weight-bearing or partial weight-bearing is decided depending on the fracture pattern for 6 weeks.
- Full weight bearing depending on radiological union after 6 weeks.

Results

In a total of 20 patients, fracture union was achieved in 19 patients (95%) of the patients, with a mean union time of 15 weeks. According to the Harris Hip Score, Functional outcome showed excellent to good results in 15 patients (75%) with a mean HHS of 86. Complications were observed in 10% of the patients, which included Non-union in 1 patient (5%) and Avascular necrosis in 1 patient (5%). Better functional and radiological outcomes were noted in Garden II & III fractures compared to Garden IV. DHS with a derotational screw provided improved rotational stability with no incidence of implant failure.

CASE 1

PRE OPERATIVE XRAY

POST OPERATIVE XRAY

6 WEEKS POST OP

12 WEEKS POST OP XRAY

24 WEEKS POST OP

CASE 2

PRE OPERATIVE XRA

POST OPERATIVE XRAY

6 WEEKS POST OP XRAY

12 WEEKS POST OP XRAY

24 WEEKS POST OP XRAY

CASE 3

PRE OPERATIVE XRAY POST OPERATIVE XRAY 6 WEEKS POST OP XRAY

12 WEEKS POST OP XRAY 24 WEEKS POST OP XRAY

CASE 4

PRE OPERATIVE XRAY POST OPERATIVE XRAY 6 WEEKS POST OP XRAY

12 WEEKS POST OP XRAY 24 WEEKS POST OP XRAY

DISCUSSION

Femoral neck fractures in young adults have high risk of **rotational instability, non-union, and AVN.** DHS provides controlled **dynamic compression**, but **rotational control** is limited in vertical (Pauwels II/III) and displaced fractures. Adding a **derotational screw** increased **rotational stability**, maintained reduction, and prevented varus collapse.

DHS + derotational screw is **simple**, **cost-effective**, and biomechanically stronger than DHS alone. Most patients achieved **excellent-good outcomes** (Harris Hip Score improvement) with minimal complications.

CONCLUSION: DHS with a derotational screw provides a **stable and reliable construct.** Reduced rotational instability, maintains the reduction, and **improves the biomechanical stability** of fixation. It achieves **good union rates and functional outcomes** in most patients. Useful especially in **vertical/displaced fractures** (Pauwels II–III, Garden III–IV). A simple modification to the standard DHS that can reduce complications like **varus collapse** and **non-union**.

REFERENCES

1. Campbell's Operative Orthopaedics Canale ST, Beaty JH. Campbell's Operative Orthopaedics. 14th ed. Elsevier.
2. Rockwood and Green's Fractures in Adults Tornetta P, Ricci W, Ostrum R, et al. Rockwood and Green's Fractures in Adults. Wolters Kluwer
3. Harris WH. Traumatic arthritis of the hip after dislocation and acetabular fractures: treatment by mold arthroplasty. J Bone Joint Surg Am. 1969;51(4):737-755.
4. Bonnaire F, Weber A, Bösl O, Eckhardt C, Schwieger K, Linke B. Pauwels III femoral neck fractures: biomechanical evaluation of different internal fixation techniques. Injury. 1998;29(5):363-368.
5. Li L, Zhao X, Yang X, Tang X, Liu M. Dynamic hip screws versus cannulated screws for femoral neck fractures: a systematic review and meta-analysis. J Orthop Surg Res. 2020;15:352.
6. Zhu J, Li Y, Zhang Y, Cheng X. Clinical outcome and biomechanical analysis of dynamic hip screw combined with derotation screw in treating displaced femoral neck fractures based on different reduction qualities in young patients. Comput Math Methods Med. 2022;2022:9505667.
7. Blair B, Koval KJ, Kummer F, Zuckerman JD. Basicervical fractures of the proximal femur: a biomechanical study of fixation methods. J Orthop Trauma. 1994;8(5):383-387.
8. Lu-Yao GL, Keller RB, Littenberg B, Wennberg JE. Outcomes after displaced fractures of the femoral neck. J Bone Joint Surg Am. 1994;76(1):15-25.
9. Swiontkowski MF. Intracapsular fractures of the hip. J Bone Joint Surg Am. 1994;76(1):129-138.
10. Gupta M, Arya RK, Kumar S, Jain VK, Sinha S, Naik AK. Comparative study of multiple cancellous screws versus dynamic hip screw and derotation screw in femoral neck fractures. J Orthop Surg. 2010;18(2):151-155.
11. Saha MK, Alam MJ, Karim R, et al. A study on management of basicervical neck femur fractures with dynamic hip screw (DHS) and derotation screw fixation. SAS J Surg. 2020;6(8):304-309.
12. Frank HC, Agarwal B, Bhatacharyya TD, Choudhury FA, Roy R. Basicervical fracture of neck femur treated with DHS and derotation screw – a prospective study of 30 cases. IOSR J Dent Med Sci. 2017;16(4):37-40.