Original article
https://doi.org/10.17816/2311-2905-17731

Comparison Between Proximal Femoral Nail and Dynamic Hip Screw in Non-Displaced or Minimally Displaced Intertrochanteric Fractures of the Femur: A Prospective Study

Mohamed H. Abdel Rahim, Mohamed Awad, Ahmed Morsi, Ahmed Elsaeed, Mostafa A. Elabd

Ain Shams University, Cairo, Egypt

Abstract

Background. Proximal femoral nail (PFN) and dynamic hip screw (DHS) are widely used for the management of intertrochanteric femur fractures (ITFs). Proximal femoral nailing offers biomechanical advantages but may cause iatrogenic displacement during the insertion.

The aim of the study — to compare the degree of fracture displacement, specifically femoral shaft lateralization and neck-shaft angle changes, following dynamic hip screw and proximal femoral nail fixation in minimally displaced or non-displaced intertrochanteric femur fractures.

Methods. A prospective cohort study was conducted on 40 patients with AO 31A1 ITFs from January to June 2024. Patients were divided into two groups: DHS (n = 20); PFN (n = 20). Radiological outcomes including postoperative neck-shaft angle and femoral shaft lateralization were measured on both injured and non-injured sides.

Results. In the PFN group, the mean postoperative neck-shaft angle (131.30±4.54°) showed a varus change compared to the intact side (134.70±3.77°), but the difference was not statistically significant (p = 0.109). In the DHS group, there was no significant difference (p = 0.827). Femoral shaft lateralization on the injured side was significantly higher in the PFN group (56.60±7.07 mm) than in the DHS group (49.50 ± 6.59 mm; p = 0.002). No significant difference was found on the non-injured side (p = 0.261).

Conclusion. Both PFN and DHS yield comparable neck-shaft angle outcomes in minimally displaced ITFs. However, PFN is associated with greater lateralization of the femoral shaft, which may reflect iatrogenic displacement during fixation.

Keywords: proximal femoral nail; dynamic hip screw; intertrochanteric femur fractures; neck-shaft angle; non-displaced fracture.

Cite as: Abdel Rahim M.H., Awad M., Morsi A., Elsaeed A., Elabd M.A. Comparison Between Proximal Femoral Nail and Dynamic Hip Screw in Non-Displaced or Minimally Displaced Intertrochanteric Fractures of the Femur: A Prospective Study. *Traumatology and Orthopedics of Russia.* 2025;31(4):84-91. https://doi.org/10.17816/2311-2905-17731.

✉ *Mohamed H. Abdel Rahim*; e-mail: Mohamedhamdy9581@gmail.com

Submitted: 15.06.2025. Accepted: 15.08.2025. Published online: 09.10.2025.

Научная статья
УДК 616.718.43/.44-001.5-089.84
https://doi.org/10.17816/2311-2905-17731

Применение проксимального бедренного стержня и динамического бедренного винта в лечении чрезвертельных переломов бедренной кости без или с минимальным смещением: сравнительное проспективное исследование

М.Х. Абдель Рахим, М. Авад, А. Мурси, А. Эльсаид, М.А. Элабд

Ain Shams University, г. Каир, Египет

Реферат

Актуальность. Проксимальный бедренный стержень (PFN, proximal femoral nail) и динамический бедренный винт (DHS, dynamic hip screw) широко используются в лечении чрезвертельных переломов бедренной кости. PFN обладает биомеханическими преимуществами, но может вызвать ятрогенное смещение во время установки.

Цель исследования — сравнить степень смещения отломков, в частности латерализацию бедренного отломка и величину шеечно-диафизарного угла, при фиксации динамическим бедренным винтом и проксимальным бедренным стержнем у пациентов с чрезвертельными переломами бедренной кости без смещения или с минимальным смещением.

Материал и методы. В период с января по июнь 2024 г. было проведено проспективное когортное исследование с участием 40 пациентов с чрезвертельным переломом типа 31A1 по AO/OTA. Пациенты были разделены на две группы (PFN, n = 20; DHS, n = 20). Рентгенологические результаты, включая послеоперационный шеечно-диафизарный угол (ШДУ) и латерализацию бедренного отломка, оценивались как с поврежденной, так и с неповрежденной стороны.

Результаты. В группе PFN средний послеоперационный ШДУ (131,30±4,54°) показал варусное изменение по сравнению с интактной стороной (134,70±3,77°), но разница не была статистически значимой (p = 0,109). В группе DHS значимой разницы выявлено не было (p = 0,827). Латерализация бедренного отломка на поврежденной стороне была статистически значимо выше в группе PFN (56,60±7,07 мм), чем в группе DHS (49,50±6,59 мм; p = 0,002). На неповрежденной стороне статистически значимой разницы обнаружено не было (p = 0,261).

Заключение. Как проксимальный бедренный стержень, так и динамический бедренный винт дают сопоставимую величину шеечно-диафизарного угла у пациентов с чрезвертельными переломами бедренной кости без смещения или с минимальным смещением. Однако проксимальный бедренный стержень ассоциируется с большей латерализацией бедренного отломка, что может вызывать ятрогенное смещение во время фиксации.

Ключевые слова: проксимальный бедренный стержень; динамический бедренный винт; чрезвертельный перелом бедренной кости; шеечно-диафизарный угол; перелом без смещения.

Для цитирования: Абдель Рахим М.Х., Авад М., Мурси А., Эльсаид А., Элабд М.А. Применение проксимального бедренного стержня и динамического бедренного винта в лечении чрезвертельных переломов бедренной кости без или с минимальным смещением: сравнительное проспективное исследование. *Травматология и ортопедия России*. 2025;31(4):84-91. (На англ.). https://doi.org/10.17816/2311-2905-17731.

Мухаммед Х. Абдель Рахим; e-mail: Mohamedhamdy9581@gmail.com

Рукопись получена: 15.06.2025. Рукопись одобрена: 15.08.2025. Статья опубликована онлайн: 09.10.2025.

INTRODUCTION

Over recent years, the application of the proximal femoral nail (PFN) in managing intertrochanteric fractures (ITFs) has seen notable growth, largely attributed to improvements in implant engineering and refinements in surgical techniques. PFN has emerged as a preferred fixation method due to multiple advantages, including decreased intraoperative blood loss, quicker implantation, facilitation of early mobilization, and minimal postoperative limb shortening [1].

From a biomechanical perspective, PFN's design ensures proximity to the mechanical axis of the lower limb, effectively shortening the lever arm and diminishing the bending forces exerted on the implant [2]. This configuration not only enhances load distribution but also mitigates collapse and reduces tensile stress, collectively lowering the risk of implant failure. Furthermore, PFN provides stable three-point fixation with controlled axial impaction, promoting fracture stability and improved clinical outcomes [3].

A recognized technical challenge associated with PFN fixation is the so-called “wedge effect”, characterized by the distraction at the fracture site during nail insertion [4]. This phenomenon can result in lateral displacement of the femoral shaft (FS) and varus malalignment of the femoral neck [5]. It typically arises when the proximal femoral canal has not been sufficiently reamed to accommodate the broader cephalomedullary portion of the PFN. In contrast, the dynamic hip screw (DHS) is generally indicated for stable intertrochanteric fractures where the medial buttress remains intact [6]. Its use is contraindicated in cases with unstable fracture configurations, reverse obliquity patterns, significant osteoporotic changes, or a compromised lateral femoral wall thickness of less than 20.5 mm [7, 8]. As a surface-based fixation system, DHS is biomechanically less likely to contribute to intraoperative fracture displacement [9].

This study hypothesizes that PFN may occasionally cause iatrogenic displacement of non-displaced or minimally displaced ITFs more frequently than DHS. *The aim of the study* — to compare the degree of fracture displacement, specifically femoral shaft lateralization and neck-shaft angle changes, following dynamic hip screw and proximal femoral nail fixation in minimally displaced or non-displaced intertrochanteric femur fractures.

METHODS

Study design

This prospective study was performed on 40 patients at Ain Shams University Hospitals from January 2024 to June 2024 to quantify the degree of fracture displacement after fixation with DHS versus PFN in cases of non-displaced or minimally displaced ITFs. The forty cases were divided into two equal groups: DHS group (n = 20) and PFN group (n = 20).

Inclusion and exclusion criteria. Patients were eligible for inclusion if they had minimally displaced (< 5 mm) or non-displaced intertrochanteric fractures classified as AO type 31A1.2 or 31A1.3. Exclusion criteria included open fractures, prior surgeries on the ipsilateral or contralateral hip, non-ambulatory status, and pathological fractures due to malignant disease.

Preoperative evaluation. All patients underwent comprehensive preoperative evaluation, including detailed history, general and local physical examination, and radiological assessment with anteroposterior and lateral hip X-rays. The femoral neck-shaft angle (NSA) was measured as part of the radiographic analysis.

Post-operative. Prevention of infection, analgesia and anticoagulation.

Radiological assessment

Postoperative evaluation included immediate anteroposterior (AP) and lateral X-rays of the hip. The femoral NSA was determined according to the methodology described by C. K. Boese et al. [10]. This angle was calculated between the axis of the femoral neck and the anatomical axis of the FS. The neck axis was drawn from the femoral head center (HC) to the neck center (NC), the latter defined as the midpoint between points where a circle (centered on the HC) intersected the superior and inferior borders of the femoral neck. The shaft axis was established by connecting central points identified at both proximal and distal segments of the femoral diaphysis [11]. The tip-apex distance (TAD) was calculated as the cumulative length from the screw tip to the apex of the femoral head as seen on both the AP and lateral projections [12]. FS lateralization was assessed by measuring the horizontal distance from the femoral head center to a reference line parallel to the lateral cortex of the femur, comparing the injured side with the contralateral uninjured side [7] (Figures 1, 2).

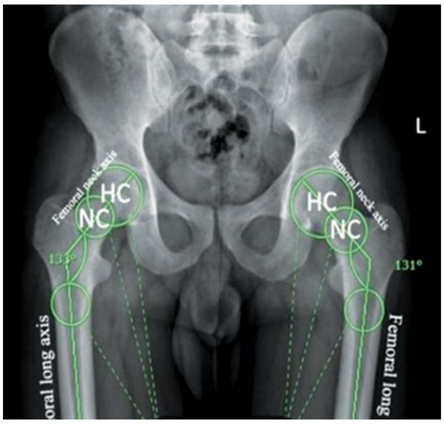

Figure 1. Neck-shaft angle measurements on an upright pelvis plain X-ray

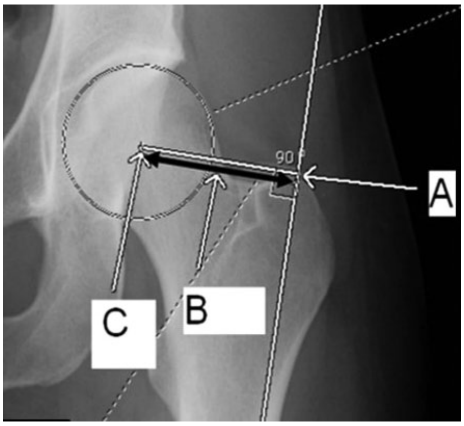

Figure 2. Calculation of the wedge effect (net lateralization of the shaft compared to the head/neck segment): line B represents the distance from the center of the femoral head (C) to the lateral femoral shaft (A)

Quality of reduction

A score out of 4 was used to quantify the quality of fracture reduction depending on radiological findings. Score 4 was interpreted as excellent reduction, 2-3 — acceptable reduction, while score 0-1 — poor (Table 1).

Table 1

Quality of reduction scoring system [8]

Item	Score
Garden alignment	
AP view: slight valgus or normal	1
Lat view: 160-180°	1
Fragment displacement	
AP view: positive or neutral medial cortex support	1
Lat view: anterior cortex smooth continuity	1
Quality of fracture reduction	
Excellent	4
Acceptable	3 or 2
Poor	1 or 0

AP — anteroposterior; Lat — lateral.

Statistical analysis

Data processing and analysis were conducted using IBM SPSS Statistics for Windows, version 23.0 (SPSS Inc., Chicago, IL, USA). Continuous variables with normal distribution were expressed as mean±standard deviation (SD) along with the range, whereas skewed (non-parametric) data were presented as medians with their corresponding interquartile ranges [IQR] (Me). Categorical data were summarized using frequencies and percentages. The normality of data distribution was evaluated using both the Kolmogorov-Smirnov and Shapiro-Wilk tests. Comparative analysis between groups was performed using the independent samples t-test for normally distributed variables, and the Mann-Whitney U test for non-normally distributed data. Qualitative variables were compared using the Chi-square test, and Fisher's exact test was applied when the expected frequency in any cell was below five. Statistical significance was determined at a 95% confidence level, with p-values < 0.05 indicating statistical significance.

RESULTS

There were no notable variations between the DHS and PFN groups regarding baseline characteristics. The mean age was 63.45±14.95 years in the DHS group and 66.45±9.08 years in the PFN group ($p = 0.147$). Sex distribution (male: 75% vs 50%, $p = 0.102$), fracture side (left: 60% vs 55%, $p = 0.749$), AO classification (31A1.2 vs 31A1.3: 55% vs 65%, $p = 0.519$), and surgeon experience (consultant: 45% vs 60%, $p = 0.272$) were also comparable between the two groups.

There was no notable variations between the DHS and PFN groups regarding the quality of reduction score. Similarly, the distribution of reduction quality levels (acceptable vs excellent) showed no significant difference between the groups (Table 2).

There was no notable variation in TAD between the DHS and PFN groups (Table 3).

No significant difference in neck shaft angles was observed postoperatively compared to the contralateral side in either PFN or DHS groups (Table 4, Figures 3, 4).

Table 2

Quality of reduction in the studied groups

	DHS	PFN	p-value
Quality of reduction score			
Mean±SD	3.20±0.77	3.10±0.72	
Median [IQR]	3 [3-4]	3 [3-4]	0.673
Range	2-4	2-4	
Level of quality of reduction score			
Acceptable	12 (60.0%)	14 (70.0%)	0.507
Excellent	8 (40.0%)	6 (30.0%)	

Table 3

Position of the implant in the studied groups

	DHS	PFN	p-value
TAD (mm)			
Mean±SD	24.88±9.41	21.72±7.01	0.236
Range	7-42	6-32	
TAD level			
Abnormal	8 (40.0%)	6 (30.0%)	0.507
Normal	12 (60.0%)	14 (70.0%)	

Table 4

Postoperative and contralateral neck-shaft angles in the studied groups, deg.

	Postoperative neck-shaft angle, deg.	Neck-shaft angle of the intact side, deg.	p-value
DHS			
Mean±SD	135.45±6.33	135.70±6.42	0.827
Range	124-147	126-147	
PFN			
Mean±SD	131.30±4.54	134.70±3.77	0.109
Range	123-139	126-140	

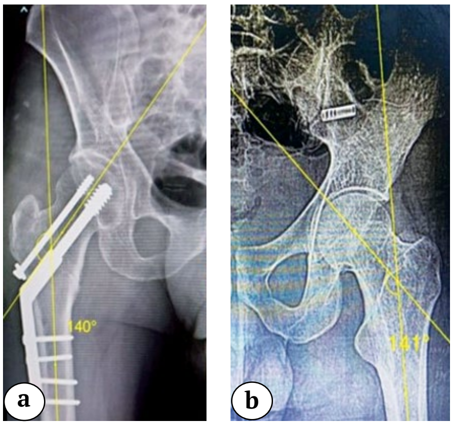

Figure 3. X-ray of a patient from the DHS group:
a — postoperative neck-shaft angle;
b — neck-shaft angle of contralateral unaffected side

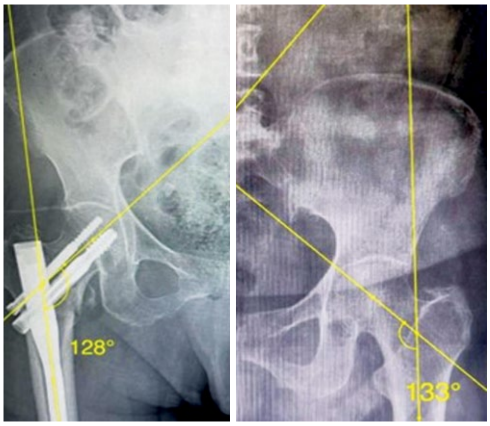

Figure 4. X-ray of a patient from the PFN group, showing 5 degrees of varus malalignment as compared to the unaffected contralateral side

In the PFN group (*n* = 20), the mean lateralization of the FS on the injured side was statistically significantly higher compared to the DHS group (56.60±7.07 vs 49.50±6.59 mm; p = 0.002). However, on the non-injured side, there was no statistically significant difference between the PFN group and the DHS group (51.65±4. vs 49.65±6.09 mm; p-value = 0. 261) (Figures 5, 6, 7).

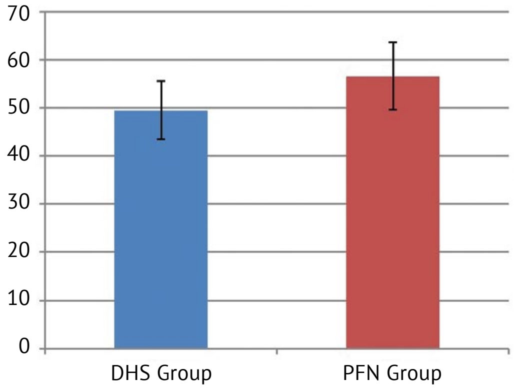

Figure 5. Femoral shaft lateralization on the injured side in the studied groups

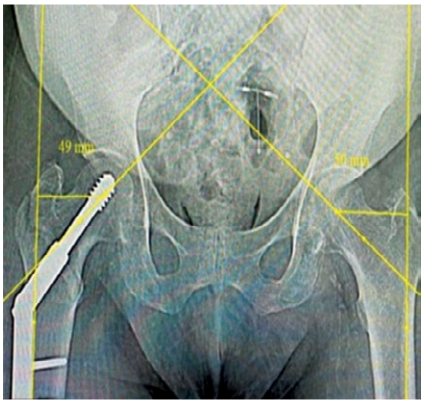

Figure 6. X-ray of a patient from the DHS group, showing femoral shaft lateralization (uninjured side — 50 mm, injured side — 49 mm)

Figure 7. X-ray of a patient from the PFN group, showing femoral shaft lateralization (uninjured side — 47 mm, injured side — 54 mm)

DISCUSSION

DHS and PFN are both widely accepted surgical options for the management of ITFs [13]. Although extensive literature exists comparing their performance in unstable fracture patterns, data specifically addressing their outcomes in stable ITFs remain relatively scarce [14]. The present study was designed to evaluate and compare the clinical and radiographic outcomes of DHS versus PFN in the operative treatment of stable intertrochanteric fractures.

The findings revealed a statistically significant increase in FS lateralization in cases treated with PFN compared to those who underwent DHS fixation. As for the NSA, the PFN group exhibited a mean varus deviation of approximately three degrees relative to the DHS group; however, this difference did not reach statistical significance.

In a study involving 70 cases with AO 31A1-2 intertrochanteric fractures, L. Fang et al. observed an inverse correlation between the femoral NSA and the degree of FS lateralization following PFN fixation. Specifically, a reduction in the NSA was associated with a corresponding increase in lateralization of the FS [7].

The concept of femoral lateralization parallels that of femoral offset — a critical parameter used to evaluate hip geometry, particularly in total hip arthroplasty. Femoral offset is modulated by the NSA, rising with varus orientation and diminishing with valgus alignment [15]. Importantly, femoral offset has been shown to positively correlate with the strength of the hip abductor musculature, especially the gluteus medius, as well as with the extent of hip abduction. Consequently, in the context of peritrochanteric fractures, restoration of femoral lateralization — akin to optimizing femoral offset in total hip arthroplasty — is essential for preserving normal hip biomechanics and should approximate the patient's native anatomical values as closely as possible [7].

A comprehensive Cochrane systematic review, encompassing 76 studies, compared DHS and PFN in the treatment of both stable and unstable ITFs. The findings indicated that extramedullary fixation methods, such as DHS, provide functional outcomes comparable to those of intramedullary (cephalomedullary) devices in managing extracapsular fragility fractures of the hip. Although intramedullary nails are linked to lower incidences of infection and non-union, they are associated with a higher rate of implant-related fractures — a complication that remains unresolved despite advances in nail design [16].

In a separate study, H. Mohan et al. evaluated 54 cases with two-part ITFs (31-A1 type in the AO classification) and concluded that there was no definitive evidence favoring PFN over DHS. Their results supported the clinical equivalence of both fixation methods in managing these specific fracture patterns [17].

In a comparative study conducted by W. Yu et al. with extended follow-up, outcomes of cases treated with proximal femoral nail anti-rotation (PFNA) were evaluated against those managed with DHS. The DHS group exhibited a higher incidence of reoperation within the first postoperative year and experienced more orthopedic-related complications. Statistically significant improvements in Harris Hip Score were consistently observed in the PFNA group across multiple follow-up intervals. However, there was no notable difference in the incidence of systemic medical complications between the two cohorts. Based on these findings, the study suggested that DHS may be less favorable than PFNA for the surgical management of stable intertrochanteric femoral fractures [18].

Study limitation

A key limitation of the study was its relatively small sample size and the absence of comprehensive clinical follow-up, which restricted the ability to correlate radiographic parameters with long-term functional outcomes.

CONCLUSIONS

Both dynamic hip screw and proximal femoral nail provide good and comparable radiological outcomes for minimally displaced intertrochanteric fractures. However, dynamic hip screw demonstrated advantages over proximal femoral nail in terms of reduced femoral shaft lateralization and lower cost. The functional impact of femoral shaft lateralization on union rates and failure rates remains unclear.

DISCLAIMERS

Author contribution. All authors made equal contributions to the study and the publication.

All authors have read and approved the final version of the manuscript of the article. All authors agree to bear responsibility for all aspects of the study to ensure proper consideration and resolution of all possible issues related to the correctness and reliability of any part of the work.

Funding source. This study was not supported by any external sources of funding.

Disclosure competing interests. The authors declare that they have no competing interests.

Ethics approval. Approval for the study was obtained from the Research and Ethics Committee of Ain Shams University (FWA000017585; approval number FMASU MS 664/2/2/2/2). Informed consent was secured from all patients prior to surgery.

Consent for publication. The authors obtained written consent from patients to participate in the study and publish the results.

Use of artificial intelligence. No generative artificial intelligence technologies were used in the preparation of this manuscript.

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ

Заявленный вклад авторов. Все авторы сделали эквивалентный вклад в подготовку публикации.

Все авторы прочли и одобрили финальную версию рукописи статьи. Все авторы согласны нести ответственность за все аспекты работы, чтобы обеспечить надлежащее рассмотрение и решение всех возможных вопросов, связанных с корректностью и надежностью любой части работы.

Источник финансирования. Авторы заявляют об отсутствии внешнего финансирования при проведении исследования.

Возможный конфликт интересов. Авторы декларируют отсутствие явных и потенциальных конфликтов интересов, связанных с публикацией настоящей статьи.

Этическая экспертиза. Разрешение на проведение исследования было получено от Комитета по этике научных исследований университета Айн-Шамс (FWA000017585; номер FMASU MS 664/2/2/2/2).

Информированное согласие на публикацию. Авторы получили письменное согласие пациентов на участие в исследовании и публикацию результатов.

Генеративный искусственный интеллект. При создании статьи технологии генеративного искусственного интеллекта не использовали.

REFERENCES

1. Jonnes C., Sm S., Najimudeen S. Type II Intertrochanteric Fractures: Proximal Femoral Nailing (PFN) Versus Dynamic Hip Screw (DHS). *Arch Bone Jt Surg.* 2016;4(1):23-28.
2. Wang C., Duan N., Li Z., Ma T., Zhang K., Wang Q. et al. Biomechanical evaluation of a new intramedullary nail compared with proximal femoral nail antirotation and InterTAN for the management of femoral intertrochanteric fractures. *Front Bioeng Biotechnol.* 2024;12:1353677. doi: 10.3389/fbioe.2024.1353677.
3. Yen S.H., Lu C.C., Ho C.J., Huang H.T., Tu H.P., Chang J.K. et al. Impact of Wedge Effect on Outcomes of Intertrochanteric Fractures Treated with Intramedullary Proximal Femoral Nail. *J Clin Med.* 2021;10(21):5112. doi: 10.3390/jcm10215112.
4. Hao W., Fang L., Yin S., Lin Y., Wang B. Reverse wedge effect following intramedullary nail fixation of trochanteric fracture, what does it imply? *BMC Musculoskelet Disord.* 2021;22(1):497. doi: 10.1186/s12891-021-04388-1.

5. Chen P.H., Wu C.C., Chen W.J. Factors affect stability of intertrochanteric fractures when elderly patients fall. Biomed J. 2016;39(1):67-71. doi: 10.1016/j.bj.2015.08.007.
6. Wu H.F., Chang C.H., Wang G.J., Lai K.A., Chen C.H. Biomechanical investigation of dynamic hip screw and wire fixation on an unstable intertrochanteric fracture. *Biomed Eng Online.* 2019;18(1):49. doi: 10.1186/s12938-019-0663-0.
7. Fang L., Qi J., Wang Z., Liu J., Zhao T., Lin Y. et al. Inverse relationship between femoral lateralization and neck-shaft angle is a joint event after intramedullary nailing of per trochanteric fractures. *Sci Rep.* 2023;13(1):10999. doi: 10.1038/s41598-023-38209-3.
8. Chang S.M., Zhang Y.Q., Ma Z., Li Q., Dargel J., Eysel P. Fracture reduction with positive medial cortical support: a key element in stability reconstruction for the unstable pertrochanteric hip fractures. *Arch Orthop Trauma Surg.* 2015;135(6):811-818. doi: 10.1007/s00402-015-2206-x.
9. Zhang Y., Hu J., Li X., Qin X. Reverse wedge effect following intramedullary nailing of a basicervical trochanteric fracture variant combined with a mechanically compromised greater trochanter. *BMC Musculoskelet Disord.* 2020;21(1):195. doi: 10.1186/s12891-020-03212-6.
10. Boese C.K., Dargel J., Oppermann J., Eysel P., Scheyerer M.J., Bredow J. et al. The femoral neck-shaft angle on plain radiographs: a systematic review. *Skeletal Radiol.* 2016;45(1):19-28. doi: 10.1007/s00256-015-2236-z.
11. Haddad B., Hamdan M., Al Nawaiseh M., Aldowekat O., Alshrouf M.A., Karam A.M. et al. Femoral neck shaft angle measurement on plain radiography: is standing or supine radiograph a reliable template for the contralateral femur? *BMC Musculoskelet Disord.* 2022;23(1):1092. doi: 10.1186/s12891-022-06071-5.
12. O'Malley M.J., Kang K.K., Azer E., Siska P.A., Farrell D.J., Tarkin I.S. Wedge effect following intramedullary hip screw fixation of intertrochanteric proximal femur fracture. *Arch Orthop Trauma Surg.* 2015;135(10):1343-1347. doi: 10.1007/s00402-015-2280-0.
13. Shiraz S., Shujauddin M., Hasan K., Elramadi A., Ahmed G. Comparison of Dynamic Hip Screw and Proximal Femoral Nailing Techniques in Stable Intertrochanteric Fractures. *Cureus*. 2023;15(1):e33366. doi: 10.7759/cureus.33366.
14. Xu H., Liu Y., Sezgin E.A., Tarasevičius Š., Christensen R., Raina D.B. et al. Comparative effectiveness research on proximal femoral nail versus dynamic hip screw in patients with trochanteric fractures: a systematic review and meta-analysis of randomized trials. *J Orthop Surg Res.* 2022;17(1):292. doi: 10.1186/s13018-022-03189-z.
15. Choi Y.S., Park J.W., Kim T.W., Kang K.S., Lee Y.K., Koo K.H. et al. Effect of Total Hip Arthroplasty on Ipsilateral Lower Limb Alignment and Knee Joint Space Width: Minimum 5-Year Follow-up. *J Korean Med Sci.* 2023;38(20):e148. doi: 10.3346/jkms.2023.38.e148.
16. Lewis S.R., Macey R., Gill J.R., Parker M.J., Griffin X.L. Cephalomedullary nails versus extramedullary implants for extracapsular hip fractures in older adults. *Cochrane Database Syst Rev.* 2022;1(1):CD000093. doi: 10.1002/14651858.CD000093.pub6.
17. Mohan H., Kumar P. Surgical Treatment of Type 31-A1 Two-part Intertrochanteric Femur Fractures: Is Proximal Femoral Nail Superior to Dynamic Hip Screw Fixation? *Cureus*. 2019;11(2):e4110. doi: 10.7759/cureus.4110.
18. Yu W., Zhang X., Zhu X., Yu Z., Xu Y., Zha G. et al. Proximal femoral nails anti-rotation versus dynamic hip screws for treatment of stable intertrochanteric femur fractures: an outcome analyses with a minimum 4 years of follow-up. *BMC Musculoskelet Disord.* 2016;17:222. doi: 10.1186/s12891-016-1079-7.

Authors' information

✉ *Mohamed H. Abdel Rahim,* MSc
Adress: 38, Abbassia Square, Next to Al-Nour Mosque, Cairo, Egypt
https://orcid.org/0009-0006-2557-1004
e-mail: Mohamedhamdy9581@gmail.com

Mohamed Awad, MD, Assistant Professor
https://orcid.org/0000-0003-4916-0411
e-mail: Mohamed_awad2007@hotmail.com

Ahmed Morsi, MD, Assistant Professor
https://orcid.org/0009-0004-0124-3351
e-mail: ahmorsi74@gmail.com

Ahmed Elsaeed, MD, Professor
https://orcid.org/0000-0002-9929-3071
e-mail: Drahmedsaeed88@yahoo.com

Mostafa A. Elabd, MD
https://orcid.org/0000-0001-5543-4971
e-mail: Moustaphaali135@gmail.com

Сведения об авторах

✉ *Мухаммед Х. Абдель Рахим*
Адрес: 38, Abbassia Square, Next to Al-Nour Mosque, Cairo, Egypt
https://orcid.org/0009-0006-2557-1004
e-mail: Mohamedhamdy9581@gmail.com

Мухаммед Авад — доцент
https://orcid.org/0000-0003-4916-0411
e-mail: Mohamed_awad2007@hotmail.com

Ахмед Мурси — доцент
https://orcid.org/0009-0004-0124-3351
e-mail: ahmorsi74@gmail.com

Ахмед Эльсаид — профессор
https://orcid.org/0000-0002-9929-3071
e-mail: Drahmedsaeed88@yahoo.com

Мустафа А. Элабд
https://orcid.org/0000-0001-5543-4971
e-mail: Moustaphaali135@gmail.com