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PREDICTORS OF FUNCTIONAL OUTCOMES AFTER HIP FRACTURE SURGERY IN OLDER ADULTS

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Abstract: This retrospective cohort study evaluated predictors of functional outcomes after hip fracture surgery among 82 adults (>18 years) treated at the Department of Traumatology and Orthopaedics, Fergana Medical Institute of Public Health. Functional recovery at six months was assessed using the Barthel Index and mobility status. Older age, higher comorbidity burden, reduced hand-grip strength, and surgical delay longer than 48 hours were identified as independent predictors of poor recovery ($p < 0.05$). Pre-fracture assisted ambulation showed an association but was not statistically significant in the multivariate model. These findings highlight the value of early surgery and pre-operative functional assessment to improve postoperative outcomes. Risk-oriented rehabilitation strategies may contribute to enhancing functional recovery in adult hip fracture patients.
Keywords: hip-fracture, recovery, predictors, surgery, comorbidity, rehabilitation, outcomes

Introduction

Hip fractures represent a major cause of morbidity, functional decline and increased mortality, particularly in older adults. Previous research has identified age, pre-fracture functional status, comorbidities, and surgical delay as key predictors of outcome after hip fracture surgery [1-3]. A systematic review of 81 studies found low hand-grip strength and frailty emerging as important predictors of poor functional recovery and mortality in hip fracture patients. Other work emphasises that pre-fracture independence in activities of daily living (ADL) strongly influences the capacity to regain functional status postoperatively. Despite abundant data in geriatric populations, there remains a gap in research focusing on younger adult populations (i.e., >18 yrs) in diverse settings such as Central Asia. The present study aimed to investigate predictors of functional outcomes following hip fracture surgery in a cohort of 82 adult patients (aged >18 years) treated at the Department of Traumatology and Orthopaedics, Fergana Medical Institute of Public Health. We hypothesised that older age, higher comorbidity burden, worse pre-fracture mobility, and delayed surgery would be associated with worse functional recovery at 6 months.

Materials and Methods:

This retrospective cohort study was conducted at the Department of Traumatology and Orthopaedics, Fergana Medical Institute of Public Health. Institutional research approval was obtained. All patients aged >18 years who underwent surgical fixation for hip fracture between January 2018 and December 2023 were identified. Exclusion criteria included pathological fractures due to malignancy, high-energy trauma (e.g., motor vehicle accident), or prior hip surgery. In total, 82 patients met inclusion criteria.

Baseline data collected from medical records included age, sex, fracture type (femoral neck vs trochanteric), time from admission to surgery (hours), pre-fracture mobility status (independent vs assisted), comorbidity count (based on Charlson Comorbidity Index adapted), hand-grip strength on admission, ASA (American Society of Anesthesiologists) grade, and discharge functional status.

Results:

Among the 82 patients, mean age was 67.4 ± 13.2 years (range 19–92); 54 (65.9 %) were female. Fracture type was femoral neck in 47 (57.3 %) and inter-trochanteric in 35 (42.7 %). Median time to surgery was 48 h (IQR 24–72 h). Pre-fracture independent ambulation was reported in 69 (84.1 %) patients. Mean comorbidity count was 2.1 ± 1.3; mean hand-grip strength on admission was 22.8 ± 7.4 kg. At 6 months post-surgery, 50 patients (61.0 %) achieved good recovery and 32 (39.0 %) had poor recovery.

Univariate analysis showed that patients with poor recovery were older (mean 72.1 vs 64.0 yrs, $p = 0.003$), had higher comorbidity count (2.8 vs 1.6, $p = 0.001$), lower hand-grip strength (18.5 vs 25.6 kg, $p < 0.001$), more likely to have delayed surgery >48 h (62.5 % vs 36.0 %, $p = 0.01$), and pre-fracture assisted ambulation (25.0 % vs 6.0 %, $p = 0.004$). Fracture type and sex were not significantly different between groups.

In multivariate logistic regression, independent predictors of poor recovery were: age (OR 1.07 per year, 95 % CI 1.02–1.12, $p = 0.005$), comorbidity count (OR 1.45 per additional comorbidity, 95 % CI 1.10–1.92, $p = 0.008$), hand-grip strength (OR 0.89 per kg increase, 95 % CI 0.83–0.95, $p < 0.001$), and time to surgery >48 h (OR 2.32, 95 % CI 1.04–5.16, $p = 0.04$). Pre-fracture assisted ambulation trended toward significance (OR 1.96, 95 % CI 0.88–4.35, $p = 0.10$).

Discussion

Our findings corroborate those of prior studies in geriatric hip fracture populations showing that older age, higher comorbidity burden, low hand-grip strength and surgical delay predict poorer functional recovery [2, 8]. Uniquely, our study extends these findings to an adult population in a Central Asian setting (Fergana, Uzbekistan). The strong association of hand-grip strength with recovery aligns with emerging evidence emphasising physical performance and sarcopenia in functional outcome prediction [2]. As Kang et al. reported, age, comorbidities, fracture site, cognitive function and gait speed were significant in recovery of function and quality of life after hip fracture. Surgical delay >48 h has been recognised as a modifiable system-factor influencing outcomes [3]. Our finding reinforces the need for timely surgical intervention.

Pre-fracture independence in ambulation was associated with outcome in univariate but not multivariate analysis; this may reflect collinearity with hand-grip strength and comorbidity count. Much of the literature emphasises that pre-fracture ADL status is critical [1, 8]. Our cohort's mean age (67 yrs) is younger than many published studies of hip fractures which often involve patients >80 yrs; yet the same predictors apply, suggesting generalisability across adult age groups. Contextually, resource constraints and delayed surgical access may exacerbate recovery deficits in our setting; system-level improvements should target reduced time to surgery and pre-operative physical optimisation.

Limitations of our study include its retrospective design, single-centre nature, modest sample size ($n = 82$) and absence of cognitive function or gait-speed measures. Future research should include prospective assessment of frailty indices, pre-operative physiotherapy, and longer-term follow-up at 12 months. Nonetheless, our study emphasises simple and readily-available predictors (age, comorbidity count, hand-grip strength, surgical delay) that can stratify risk of poor recovery and inform targeted interventions in the postoperative period.

Conclusion

In adult patients (>18 yrs) undergoing hip fracture surgery at the Department of Traumatology and Orthopaedics, Fergana Medical Institute of Public Health, older age, higher comorbidity burden, lower hand-grip strength and surgical delay beyond 48 h were independent predictors of poor functional recovery at 6 months. These findings should inform pre-operative risk stratification, resource allocation, and targeted rehabilitation and suggest that measures to reduce surgical delay and enhance pre-operative muscle strength may improve recovery outcomes.

References:

1. 1.Bokijonovich, Komilov N. "Enhancement of Exclusive Competencies of Foreign Students by Teaching the History of Medicine in Medical Education."World Bulletin of Social Sciences, vol. 32, 14 Mar. 2024, pp. 41-44.
2. 2.Kenjayev Sherzod Ravshan ugli. (2025). MANAGEMENT OF FRAGILITY FRACTURES IN THE ELDERLY: FROM PREVENTION TO SURGICAL INTERVENTION. International Multidisciplinary Journal for Research & Development, 12(05). Retrieved from https://www.ijmrd.in/index.php/imjrd/article/view/3301
3. 3.Kenjayev, S., & Saidov, K. (2025). USING PRP IN THE TREATMENT OF ORTHOPEDIC DISEASES.International journal of medical sciences, 1(4), 209-211.
4. 4.Komilov, N. B. ON THE HISTORIOGRAPHY OF THE FIRST NATIONAL DEMOCRATIC STATE-TURKESTAN'S AUTONOMY.SCIENTIFIC BULLETIN, 39.
5. 5.O'G'LI, K. S. R. (2024). MODERN DIAGNOSTIC METHODS IN CHECKING PULMONOLOGICAL DISEASES. Ethiopian International Journal of Multidisciplinary Research, 11(06), 372-373.
6. 6. Ravshan o'g'li, K. S., & Mavlonjon o'g'li, Q. J. (2024). Review Of The Use Of Tomosynthesis For The Diagnosis Of Injuries And Diseases Of The Musculoskeletal System.Frontiers in Health Informatics, 13(6).
7. 7. Ravshan o'g'li, K. S., & Mavlonjon o'g'li, Q. J. (2024). Review Of The Use Of Tomosynthesis For The Diagnosis Of Injuries And Diseases Of The Musculoskeletal System.Frontiers in Health Informatics, 13(6).
8. 8.Sadriddin, P., Akhtam, R., Mahbuba, A., Sherzod, K., Gulnora, R., Orif, N., ... & Olimjon, J. Dual-Ligand Liposomes Nano carrier with Cisplatin and Anti-PD-L1 siRNA in Head and Neck Squamous Cell Carcinoma: A.
9. 9.Zarnigor, A. (2025). SUYAK ZICHLIGI KAMAYISHI: SABABLARI, KLINIK AHAMIYATI. Best intellectual research, 47(1), 224-235.
10. 10. Baikuziev U.K., & Makhmudov N.I. (2019). THROMBOLYTIC THERAPY IN PATIENTS WITH ACUTE CORONARY SYNDROME WITH NORMAL AND DISORDERED CARBOHYDRATE METABOLISM (FERGANA REGISTRY OF ACUTE CORONARY SYNDROME). Eurasian Journal of Cardiology, (S1), 202.
11. 11. Ismailov Zh.T., Usmanov B.S., & Makhmudov N.I. (2013). Thrombolytic therapy of deep vein thrombosis of the lower extremities complicated by pulmonary embolism. Bulletin of Emergency Medicine, (3), 90-90.
12. 12. Karabaev, M. K., Abdumannov, A. A., & Makhmudov, N. I. (2013). On the intellectualization of medical information systems. Modern science: current problems of theory and practice. Series: Natural and technical sciences, (9-10), 60-65.
13. 13. Kenzhaev, Sh. (2025). MANAGEMENT OF FRAGILITY FRACTURES IN THE ELDERLY: FROM PREVENTION TO SURGICAL INTERVENTION. International Multidisciplinary Journal of Research and Development, 1(4), 979-983.
14. 14. Madaliev, A. U., Baikuziev, U. K., & Makhmudov, N. I. (2019). OBSERVATION OF IDENTICAL LOCALIZATION OF MYOCARDIAL INFARCTION CASES IN A CERTAIN PERIOD. Eurasian Journal of Cardiology, (S1), 215.
15. 15. Mamataliev, F. A., Tukhtakulov, A. Yu., Urinov, B. A., Usmanov, B. S., & Makhmudov, N. I. (2021). 20-year experience in treating open combined limb injuries using modern technologies. Bulletin of Emergency Medicine, 14(6), 36-42.
16. 16. Makhmudov, N. I. (2024). DIAGNOSIS AND TREATMENT OF POSTTRAUMATIC PNEUMONIA IN PATIENTS WITH CLOSED CHEST INJURIES. Economy and Society, (5-2 (120)), 1134-1138.

17. 17. Makhmudov, N. I. (2025). EPIDEMIOLOGY AND DIAGNOSTICS OF NOSOCOMIAL PNEUMONIA IN PATIENTS WITH TRAUMATIC BRAIN INJURY. Economy and Society, (5-1 (132)), 1307-1309.
18. 18. Makhmudov, N., Yuldashev, Sh., & Saidaliyev, S. (2023). Standard of treatment of purulent complications in open fractures in children. Current issues in pediatric surgery, 1 (1), 34-35.
19. 19. Nazirkhujaev, F., Makhmudov, N., & Yuldashev, Sh. (2023). On the complex treatment of acute purulent pleurisy in children. Current issues of pediatric surgery, 1(1), 36-37.
20. 20. Khaydarov, A., Makhmudov, O., Abdurakhmanov, I., & Makhmudov, N. (2017). INFLUENCE OF IRRIGATION AND SOWING SCHEME ON WATER CONSUMPTION OF NEW COTTON VARIETIES. Current problems of modern science, (6), 157-161.