

ORIGINAL ARTICLE

Incidence of Pre-Operative Deep Vein Thrombosis in Patients with Post-Hip Fractures

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ABSTRACT

Objective: To estimate the incidence of pre-operative deep vein thrombosis in patients with post-hip fractures.

Study Design: Prospective study

Place and Duration of Study: Department of Orthopaedic Surgery, Jinnah Postgraduate Medical Centre, Karachi from 1st January 2019 to 31st December 2021.

Methodology: One hundred cases hip fractures which were analyzed for incidence of deep vein thrombosis. Three types of tests were used for confirmation including ultrasonography, computed topography and the venography. In cases where identification of deep vein thrombosis was confirmed the implantation of inferior vena cava filters was ensured.

Results: There were seven such cases that were having deep vein thrombosis presentation in them while rest of 93% did not have any clinical presentation for deep vein thrombosis with their hip fracture. The incidence of the pre operative deep vein thrombosis was significantly higher in cases that were brought after 72 hours deep vein thrombosis was highest in cases that were within the age bracket of 70-79 years.

Conclusion: A lower incidence as 7% of deep vein thrombosis occurs in pre operative cases of hip fracture.

Keywords: Incidence, Deep vein thrombosis, Post-hip fracture

INTRODUCTION

There are various types of hip fractures which includes inter trochanteric fracture, femur-neck fractures as well as sub-trochanteric fractures which are the major fractures related with the osteoporosis.¹ The global incidence reports elaborated that almost six million people will be affected by year 2050 from one or other type of fractures.² The hip fractures are considered elderly fractures as is associated with various type of morbidity and also with mortality.³ Treating geriatric fractures is a major challenge as multiple age related comorbidities can cause its treatment difficult and complications during the operation.^{4,5}

Early mobilization after the obtaining of the stable reduction as well as fixation reduces the risk of development of perioperative-complications. Early surgical procedures are one of the important methods to prevent complications and morbidities.^{6,7}

Out of the other major complications deep vein thrombosis (DVT) is a common complication which can be observed in perioperative hip fracture patients. Deep vein thrombosis can be presented not only in perioperative state but also at the post operative period.⁸⁻¹¹

A study describes that 8 to 34.9% of the cases with hip fractures suffers from deep vein thrombosis. This prevalence can be raise up to 62% depending upon delay in surgical procedure.¹² Deep vein thrombosis accelerated prevalence can also be presented in cases where time delay between injury and surgery has been observed especially in female cases. Different kind of variables as obesity, D dimers, age, ASA class have a significant impact on deep vein thrombosis in hip fracture patients.¹³ The present study was designed for assessing the incidence of deep vein thrombosis in hip fracture cases before operation. The results of this study can assist in identifying the need of un-delayed surgeries and factors which related to the formation of deep vein thrombosis pre operation.

MATERIALS AND METHODS

This prospective study was conducted at Department of Orthopaedic Surgery, Department of Orthopaedic Surgery, Jinnah Postgraduate Medical Centre, Karachi from 1st January 2019 to 31st December 2021. A total of 100 cases of hip fractures were enrolled for incidence of deep vein thrombosis. Each patient informed consent was received for participation. Those patients who were having high-energy injuries or pathological fractures and

below the age of 55 were not included in this research. In each patient a complete examination was conducted to assess the incidence of deep vein thrombosis in them. Tenderness, edema warmth, pain, erythema, as well as signs of rapid ankle-dorsiflexion were clinically assessed for the lower extremities of the patients. Three types of tests were used for confirmation including ultrasonography, computed topography and the venography. In cases where deep vein thrombosis was absent intermediate pneumatic devices were placed as prevention against formation of deep vein thrombosis. In cases where identification of DVT was confirmed the implantation of inferior vena cava filters was ensured. In this protocol patients were further divided as DVT group and non DVT group. The age, gender and clinical history as well as signs and symptoms details were gathered from patients interviewing and medical record. This data was entered in a well-structured questionnaire. Data was analyzed by using SPSS-26. Chi-square test and 't' test were used for analysis by using value of significance as P<0.05.

RESULTS

There were seven such cases that were having DVT presentation in them while rest of 93% did not have any clinical presentation for DVT with their hip fracture. The mean age of DVT group showed an age of 60.7±7.1 years while non DVT group mean age was evidently lower than DVT group with a value of 56.4±5.5 years respectively. There were more males in both groups than females (Table 1).

The incidence of the pre operative deep vein thrombosis was significantly higher in cases that were brought after 72 hours than those who were brought earlier with an incidence of 23.5%. Popliteal thrombus was presented in higher incidence in patients brought within 72 hours bracket (Table 2).

Table 1: Demographic data of patients

Variable	DVT group (n=7)	Non-DVT group (n=93)	p-value
Age (years)	60.7±7.1	56.4±5.5	0.33
Gender			
Male	5	61	0.08
Female	2	32	
Type of fractures (neck:trochanter)	2:5	62:31	0.96
Previous history of thromboembolism	1	0	-

Within various age groups the incidence of pre operative, DVT was highest in cases that were within the age bracket of 70-79 years followed by similar incidence in 60-69 years and 80-89 years respectively (Fig. 1).

Table 2: Incidence of Pre-operative DVT in accordance with admission time

Variable	Admission time in hours		p-value
	Within 72 (n=83)	After 72 (n=17)	
Popliteal thrombus	3	2	0.02
Femoral thrombus	0	1	-
DVT	3 (3.61%)	4 (23.5%)	0.01

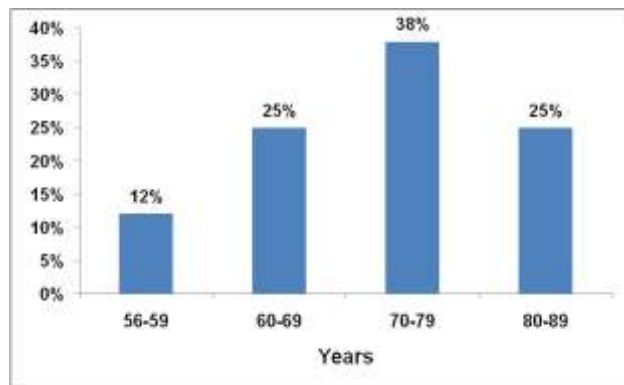


Fig. 1: Age-wise distribution of DVT incidence

DISCUSSION

Deep vein thrombosis is a significantly reported problem post hip fractures. The occurrence is most commonly reported within the injury and surgical procedure initiation interval and the reason being non mobility of the patient within that period. The incidence of DVT in pre-operative hip fracture surgery has been widely researched with various researches been published in this context.^{14,15} The current study results showed that delay in surgery can be a main cause of DVT in patients. This time delay can be due to many reasons including patients overall condition, or any other underlying medical condition.^{16,17}

Recent research advancement has recommended the use of thrombo-prophylaxis in addition to low dose heparin during the interval of hospital admission and surgery for preventing DVT formation. Patients who are under high alert of bleeding required the administration of thrombo-prophylaxis. Despite of all the preventive measures the global incidence of DVT is reported around 9-62% in patients who are receiving prophylaxis. In cases of mechanical-prophylaxis as well as surgery there is an important detachment risk as well as proximal thrombi propagation which has already been generated as a result of vital management of the incapacitated extremities.^{18,19}

The present study result showed a low incidence of DVT which is in similarity with previously reported data from Asian countries.²⁰ However, the specific incidence was higher in cases which were delayed >72 hours. Similar results have been reported in western research as well as reports from Asia.^{20,21}

There has been controversial evidence regarding the insertion of the IVC as treatment plan in patients with hip fractures. The exact indication for the venous-interruption in deep vein thrombosis cases is through hemorrhagic related complication prediction or anticoagulant triggered bleeding specifically in patients with tendency of lesions as well as anticoagulation failure.²⁰ There is high risk of proximal deep vein thrombosis to result into fetal pulmonary embolism in comparison to distal deep vein thrombosis specially in the time of operation. Scientist has reported in their research that IVC in prophylactic can safely be placed in trauma cases with high risk and decreased morbidity in addition to no prolonged disabilities involved.²¹

CONCLUSION

A lower incidence as 7% of deep vein thrombosis occurs in pre operative cases of hip fracture. This incidence is higher to be presented in age group of 70-79 years.

REFERENCES

- Zhang YZ. Clinical epidemiology of orthopaedic trauma. New York: Thieme; 2016.
- Socci AR, Casemir NE, Leslie MP, Baumgaertner MR. Implant options for the treatment of intertrochanteric fractures of the hip: rationale, evidence, and recommendations. *Bone Joint J* 2017; 99-B(1): 128-33.
- Shin WC, Do MU, Woo SH, et al. C-reactive protein for early detection of postoperative systemic infections in intertrochanteric femoral fractures. *Injury* 2018;49(10):1859-64.
- Tawari AA, Kempegowda H, Suk M, et al. What makes an intertrochanteric fracture unstable in 2015? Does the lateral wall play a role in the decision matrix? *J Orthop Trauma* 2015; 29(Suppl 4):S4-9.
- Kannus P, Parkkari J, Sievanen H, Heinonen A, et al. Epidemiology of hip fractures. *Bone* 1996; 18(1 Suppl):S57S-63.
- De L, Van Rijckevorsel VAJIM, Raats JW, et al. Delirium after hip hemiarthroplasty for proximal femoral fractures in elderly patients: risk factors and clinical outcomes. *Clin Interv Aging* 2019; 14:427-35.
- Colais P, Martino MD, Fusco D, Perucci CA, Davoli M. The effect of early surgery after hip fracture on 1-year mortality. *BMC Geriatr* 2015;15:1-8.
- Zhao K, Zhang J, Li J, Guo J, Meng H, Zhu Y, et al. In-hospital postoperative pneumonia following geriatric intertrochanteric fracture surgery: incidence and risk factors. *Clin Interv Aging* 2020; 15: 1599-1609.
- Testa G, Vescio A, Zuccalà D, Petrantoni V, Amico M, Russo GI, Sessa G, Pavone V. Diagnosis, treatment and prevention of sarcopenia in hip fractured patients: where we are and where we are going: a systematic review. *J Clin Med* 2020;9(9):2997.
- Shin WC, Woo SH, Lee SJ, et al. Preoperative prevalence of and risk factors for venous thromboembolism in patients with a hip fracture: an indirect multidetector CT venography study. *J Bone Joint Surg Am* 2016;98(24):2089-95.
- Zhang BF, Wei X, Huang H, et al. Deep vein thrombosis in bilateral lower extremities after hip fracture: a retrospective study of 463 patients. *Clin Interv Aging* 2018;13:681-9.
- Smith EB, Parvizi J, Purtill JJ. Delayed surgery for patients with femur and hip fractures-risk of deep venous thrombosis. *J Trauma* 2011;70(6):E113-6.
- Monreal M, Ruiz J, Olazabal A, Arias A, Roca J. Deep venous thrombosis and the risk of pulmonary embolism: a systematic study. *Chest* 1992;102(3):677-81.
- Mitra AK, Khoo TK, Ngan CC. Deep-vein thrombosis following hip surgery for fracture of the proximal femur. *Singapore Med J* 1989; 30(6):530-34.
- Chan YK, Chiu KY, Cheng SW, Ho P. The incidence of deep vein thrombosis in elderly Chinese suffering hip fracture is low without prophylaxis: a prospective study using serial duplex ultrasound. *J Orthop Surg (Hong Kong)* 2004;12(2):178-83.
- Debnath J, Sharma V. Diagnosing pulmonary thromboembolism: concerns and controversies. *Med J Armed Forces India* 2022; 78(1):17-23.
- Smith EB, Parvizi J, Purtill JJ. Delayed surgery for patients with femur and hip fractures-risk of deep venous thrombosis. *J Trauma* 2011; 70(6): E113-6.
- Leizorovicz A, Turpie AG, Cohen AT, Wong L, Yoo MC, Dans A. Epidemiology of venous thromboembolism in Asian patients undergoing major orthopedic surgery without thromboprophylaxis: the SMART study. *J Thromb Haemost* 2005;3(1):28-34.
- Piovella F, Wang CJ, Lu H, et al. Deep-vein thrombosis rates after major orthopedic surgery in Asia: an epidemiological study based on postoperative screening with centrally adjudicated bilateral venography. *J Thromb Haemost* 2005;3(12):2664-70.
- Douek P, Rotzinger DC, Meuli RA, Dunet V, Schmidt S. Impact of CT venography added to CT pulmonary angiography for the detection of deep venous thrombosis and relevant incidental CT findings. *Eur J Radiol* 2020; 133: 109388.
- Cho YH, Byun YS, Jeong DG, Han IH, Park YB. Preoperative Incidence of Deep Vein Thrombosis after Hip Fractures in Korean. *Clin Orthop Surg* 2015;7(3):298-302.