



Original Research Article

Incidence of deep vein thrombosis in postoperative hip fracture patients in Tertiary Care Hospital Chitradurga

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ABSTRACT

Background: Deep vein thrombosis (DVT) is the formation of a blood clot in a deep vein most commonly in the legs or pelvis. There are many reports about deep vein thrombosis from Western regions but few reports are from India.

Objectives: The purpose of the present study is to reveal the incidence of deep vein thrombosis in postoperative hip fracture patients in tertiary care hospital Chitradurga.

Materials and Methods: Sixty nine patients who had intertrochanteric fracture or femoral neck fracture are included. They had fixation or hemiarthroplasty performed depends upon the indications. Bilateral Venography was performed on sixth day to tenth day after the surgery.

Results: The positive venography result was 50.7%. These includes 5 distal (14.2%), 28 (80%) proximal and 2 (5.7%) bilateral DVT. The incidence of combined proximal and bilateral DVT were therefore 56.5%. Of 35 patients with DVT, only 8 (22.8%) patients had signs or symptoms suggestive of DVT.

Conclusion: Intertrochanteric and femoral neck fracture is a common type of hip fracture in the elderly, and the incidence of DVT after Intertrochanteric and femoral neck fracture may be underestimated. Early intervention (early admission and early surgery) might reduce the incidence of DVT.

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1. Introduction

One of the risks of hip replacement is deep vein thrombosis (DVT), a serious condition in which a blood clot develops in a vein deep within the body. Such clots are at risk of breaking away and traveling to the lungs, resulting in a pulmonary embolism, which can be fatal.¹ Deep vein thrombosis (DVT) can occur in up to 50% of patients undergoing surgery for hip fracture.² This will potentially increase the danger of pulmonary embolism (PE) since DVT is typically present in additional than 90% of PE cases.³ The important contributing factors to the event of venous thrombosis include venous stasis, hypercoagulability and injury to the venous endothelium.²⁻⁴

For orthopedic patients, venous stasis is typically a results of prolonged immobilization. The

immobilization period may range from the time of trauma to pre-operative preparation and limitation of movement or movement range after surgery. Endothelial injury to deep veins could also be caused directly from trauma itself or from surgical procedure. Studies revealed that venous function was significantly reduced after surgery involving proximal femur which correlated with the occurrence of deep vein thrombosis.⁵ Additionally, this reduced function may result from hematoma formation, thermal injury or during cement polymerization in hip replacement surgery. Other factors like aging, obesity and comorbidities like coronary failure, varicose vein, and hypercoagulable state could also be present and contribute to the occurrence of venous thrombosis during this population.

In 1989, Haake and Berkman reported that venous thromboembolism and fatal embolism occurred in 39-74% when the patients didn't get prophylaxis and 3.6-12.9% of

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patients with hip fracture with prophylaxis.² In an earlier study by Salzman and Harris, DVT was found in 34–83% of patients with hip fracture.⁶ Among these patients, two thirds of the patients were asymptomatic and went undiagnosed. On the contrary, only 50% of patients who had symptoms consistent with DVT were proved to possess DVT.⁷ There are many reports about deep vein thrombosis from Western regions but few reports are from India hence the study were conducted.

2. Materials and Methods

Sixty nine patients with femoral neck fracture and intertrochanteric fracture receiving surgical treatment (either hemiarthroplasty or any types of fixation) at Basaveshwara medical college and Hospital from February 2019 to January 2020 and who gave their consents were included in the study. Institutional ethical committee approval was taken before conducting the study. Inclusion criteria included age > 60 years old, without a history of dye allergy, no prior history of DVT, never received anticoagulant therapy and having serum creatinine of no quite 180 mmol/L. Patients who met the inclusion criteria and gave their consent were enrolled. Sequential bilateral venography was performed from post-operation day 6 to 10 since this was generally the time when thrombus occurred.⁸ All the patients received hydration with 5% D/NSS/2 at the speed of 1 ml/kg/hr for 12 hours prior to and after venography to stop contrast media induced renal failure.⁹ Non-ionic, low osmolality contrast media was utilized in all patients to scale back the risk of renal complications.^{10–12} The results of venography were evaluated by two vascular radiologists.

1. Diagnostic criteria for venography utilized in the present study were as follow.¹³
2. Constant filling defect showing thrombus attached to vein either within the central or eccentric location.
3. Abrupt termination of the dye column which is characterized by obstruction of contrast media by thrombus.
4. Non-filling of the whole deep venous system or portion, thereof when the right technique is used.
5. Diversion of flow which occurs when contrast media flows into the collateral branch as a result of deep vein occlusion.
6. Descriptive analysis was done to describe the incidence of DVT. The incidence of DVT was presented by means of percentage.

3. Results

Out of 69 patients 31(45%) were males and 38(55%) are females. Thirty three patients were diagnosed as femoral neck fracture and thirty six patients were diagnosed as intertrochanteric fracture, respectively. DVT was found in

Table 1: Demographic characteristic of study population

	Type of fractures		Total
	Femoral Neck fracture	Intertrochanteric fracture	
Age mean	71(61-81)	68(61-76)	
Gender			
Male	12	19	31
Female	18	20	38
Type of surgery			
Hemiarthroplast	31	11	42
Fixation	2	25	27

35 patients (50.7%). These included 5 distal (14.2%), 28 (80%) proximal and 2 (5.7%) bilateral DVT. The incidence of combined proximal and bilateral DVT were therefore 56.5%. Of 35 patients with DVT, only 8 (22.8%) patients had signs or symptoms suggestive of DVT.

Table 2: Location of DVT by types of fracture

Location of DVT	Femoral neck fracture	Intertrochanteric fracture	Total
DVT	14	21	35
positive			
Calf veins	2	3	5
Popliteal vein	3	4	7
Popliteal and calf veins	1	4	5
Femoral vein	2	5	7
Femoral and calf veins	3	2	4
Femoral, popliteal and calf veins	2	2	4
Bilateral DVT	1	1	2
	1	1	2
No DVT	19	15	34
Total	33	36	69

4. Discussion

Haake and Berkman reported that the incidence of venous thromboembolism (DVT and PE) after hip surgery ranged from 39 to 74% (mean of 50%; 281 of 567 patients). 45% (226/497) and 29% (91/318) of DVTs occurred on the ipsilateral and contralateral legs, respectively. For PE, there was 11.2% of total PE while 7.5% were fatal.² Demer et al (1991) found that DVT occurred in 46 % (29/63) of patients undergoing surgery for hip fracture who received no DVT prophylaxis.¹⁴ Montrey et al (1985)

and Snook et al., reported a DVT incidence of 25% (55/217) and 60%(15/25). These studies all employed venography because the standard diagnostic tool.^{15,16}

Additionally, Sevtitt and Gallagher conducted serial autopsies on 35 patients who died after hip fracture and located that DVT was present in 29 cases (83%).¹⁷ Mok et al from Hong Kong (1979) reported a 53.1% and 14.3% incidence of DVT within the ipsilateral and contralateral legs, respectively.¹⁸ Mitra et al., from Singapore conducted a prospective study in 72 patients with fractures on the proximal femur and found that the incidence of DVT in their population was 9.7%.¹⁹ Dhillon et al from Malaysia performed bilateral ascending venography in 88 patients with either fracture of the proximal femur or for total hip or knee replacement and reported a 50% incidence of DVT in patients with fractured femur.²⁰ As for studies conducted in a Thai population, only a few published reports are available. The first report was from Siriraj Hospital in 1976. This study was a serial autopsy from 1960 to 1969. Among approximately 7,500 cases, venous thromboembolism were found in 200 cases which corresponded to an incidence of 2.6%.²¹ In 1989, a result of autopsy accumulated over 18 years at Ramathibodhi Hospital revealed the incidence of PE at 0.24% (12/4,896).²²

In our study the incidence of DVT is more when compared to the previously reported studies. The authors found 50.7% of deep vein thrombosis in postoperative hip fracture patients. This might be a result of the high sensitivity of venography in detecting the presence of DVT. Venography is currently considered the gold standard diagnostic tool for this indication and is usually utilized in this area of research.

Although DVT may develop without clinical symptoms, thrombus originating from DVT may lodge into the circulation and cause fatal PE or cause significant damage to the venous valve resulting in post-thrombotic syndrome. Preventive measures getting to reduce venous thromboembolism complications in orthopedic surgery may be a common practice and also recommended that giving thromboprophylaxis to all or any elderly patients with hip fracture.

5. Conclusion

Intertrochanteric and femoral neck fracture is a common type of hip fracture in the elderly, and the incidence of DVT after Intertrochanteric and femoral neck fracture may be underestimated. Early intervention (early admission and early surgery) might reduce the incidence of DVT.

6. Source of Funding

None.

7. Conflict of Interest

None.

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