

# Comparison of Mean Pain Score by Applying with and without Skin Traction in Patients with Hip Fracture

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## ABSTRACT

**Background:** Fractures of the proximal femur are generally referred to as fractures of the hip. Femoral neck fracture and intertrochanteric fracture are both common in men & women about the same frequency. Pain reduction during preop preparatory period is important in hip fracture patients.

**Aim:** To compare the mean pain score in patients with hip fractures treated with and without skin traction prior to undergoing surgical intervention.

**Study Design:** Randomized control trial.

**Study Setting:** Orthopedics, Jinnah Hospital, Lahore, indoor patients and those admitted from ER.

**Methods:** 100 patients presenting with hip fracture were included in the study. Patients were divided randomly in with skin traction (group A) and without skin traction (group B) groups. Group A comprising of 50 patients, with hip fracture had skin traction prior to undergoing surgical intervention. Group B comprising of 50 patients, were managed without any skin traction prior to undergoing surgical intervention. Student's t-test was used for comparison of mean postop pain in both groups.

**Results:** Our study included 100 cases of fractures of the proximal femur in adults. Mean age of subject.39 SD 13.67 with minimum age was 26 years and maximum age was 74 years. 69% were male patients and 32% were female patients. 44% of fractures were of neck of femur, 33% were pertrochantaric and 23% were subtrochantaric fractures. VAS score of group A (with skin traction) was 2.5400 SD .83812. In group B (without skin traction), 50 patients were placed. Mean Preoperative VAS score of group B (with skin traction) was 2.2400 SD. 91607 with minimum VAS was 1 and maximum VAS was 5.

**Conclusion:** The conclusion of the study is that routine use of skin traction in patients with hip fractures has no effect in reduction of pain preoperatively.

**Keywords:** Proximal Hip Fracture, skin traction, pain relief.

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## INTRODUCTION

Fractures of the proximal femur are generally referred to as fractures of the hip. Femoral neck fracture and intertrochanteric fracture are both common in men and women with about the same frequency. They are both more common in women than in men by a margin of three to one.<sup>1</sup> other risk factors include Caucasian race, osteoporosis<sup>1</sup>, neurological impairment, malnutrition, impaired vision, malignancy, and decreased physical activity<sup>2</sup>. Subtrochanteric fractures, which account for 10% to 15% of proximal femoral fractures, have a bimodal distribution pattern, appearing commonly in patients 20 to 40 years of age and in those over 60 years of age. The prognosis for each of the three major categories of hip fractures arc entirely different age of the patient<sup>2</sup>.

Proximal femoral fractures are among the most common injuries that require surgical treatment. Since it is typically seen in elderly individuals, these patients should undergo comprehensive medical

examination prior to surgical approval or surgery. Although hip fracture is rarely observed in young individuals, preoperative preparations may take longer than usual, because hip fractures in this group of patients are caused generally by high-energy traumas<sup>3</sup>. Therefore, pain reduction during the preoperative preparatory period is important in hip fracture patients for both groups. Since traction is believed to reduce pain, skin traction issued in many hip fracture patients<sup>3,6,12</sup>.

It is demonstrated in some studies that skin traction does not provide any advantage in pain control, and that additional analgesic agents are required<sup>4,5,7</sup>. However, skin traction is still applied in practice, possibly to create the impression that active measures are being taken for pain and fracture control. Magnitude of pain is measured by using visual analogue scoring system. Scoring ranges from 0 to 10, where 0 will be taken as no pain and 10 for severe pain<sup>7</sup>.

In a study done by Saygi et al compared pain reduction among patients with intertrochanteric femur fracture with skin traction and without skin traction the pain assessed on VAS at 12 hours preoperatively 3.63 (±0.84) and 3.04 (±0.76 ) respectively<sup>3</sup>.

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The rationale of my study is to assess mean pain score by applying Skin traction or without skin traction of patients with hip fracture 12 hours prior to undergoing surgical interventions. Applying skin traction is considered to be reducing pain and on the other hand there are other hazards like pressure sores, blisters secondary to mechanical shearing forces. Different studies done on skin traction showed no role in pain reduction<sup>4,5,7</sup>.

In a study done by Handoll et al evaluated different studies for comparison of per operative reaction versus no traction in which Resh et al had mean 3.9(±2.4) in traction group and 3.4 (±2.1) in no traction group. Rosen et al had a mean score of 4.62(±2.42) in traction group and 4.68(±2.89) in no traction group. Skin traction or without applying skin traction of patients with hip fracture prior to undergoing surgical interventions, so that we can create guidelines in management of hip fractures for use of skin traction.

## MATERIAL AND METHODS

This comparative cross sectional study was conducted in the Department of Orthopaedics, Jinnah Hospital, Lahore during six period of six months. Sample size calculated from win pepi ver: 11.15, With significance level of 5%, power of study 80%, ratio of sample size in both group 1:1, SD in group A is 1.14, SD in group B 1.29 and amount of difference to be detected is 0.10. Required sample size is 50. (25 in each group). Non-probability / purposive sampling was used. All patients between 25-75 years of age with hip fracture including fracture neck of femur, intertrochanteric fracture, subtrochanteric fractures were included in the study. Patients with medically unfit for definitive surgical treatment on examination, multiple fractures diagnosed on X-ray and with polytrauma diagnosed on X-ray were excluded. 100 patients presenting in the department of Orthopedics' surgery through emergency of Jinnah Hospital Lahore, fulfilling the selection criteria were included in the study. After approval from hospital ethical committee and informed consent was obtained from them after discussion of risk versus benefit ratio. Patients were divided randomly in with skin traction (group A) and without skin traction (group B) groups by the help of random number table.

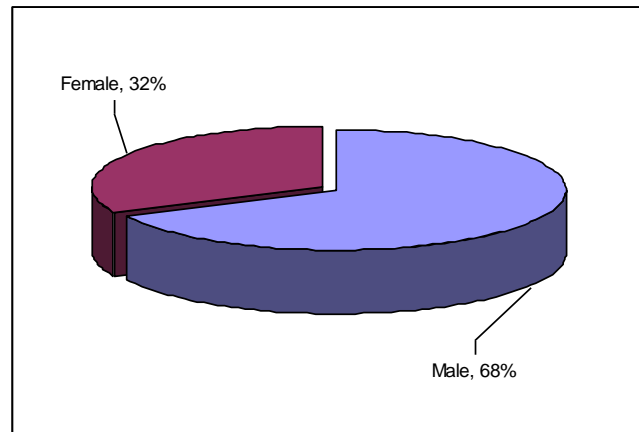
Group A comprising of 50 pts, with hip fracture had skin traction prior to undergoing surgical intervention. Group B comprising of 50 patients, were managed without any skin traction prior to undergoing surgical intervention. Visual analogue pain scale was used in both groups to assess the pain score on day prior to undergoing surgical intervention. All the collected information was entered and analyzed by SPSS 17.0. Mean and standard

deviation of age and post-operative pain score were calculated and presented in the form of tables. Student's t-test was used for comparison of mean post-operative pain in both groups. P-value  $\leq 0.05$  will be considered as significant.

## RESULTS

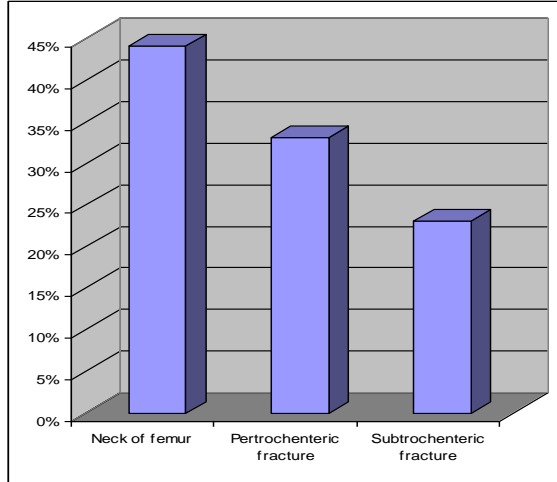
Our study included 100 cases of fractures of the proximal femur in adults. Mean age of subjects were 39 years SD 13.67 with minimum age was 26 years and maximum age was 74 years. Mean age of patients in Group A (with traction) was 46.98 SD 14.80 with minimum age was 27 years and maximum age was 75 years and in Group B (without skin traction) was 45.80 SD 12.56 with minimum age was 26 years and maximum age was 74 years. 47% of respondents were between age groups of. 25-40 years, 38% patients were between 41-60 years of age and 15% patients more than 61 years of age. Mean (Table 1). 69% were male patients and 32% were female patients (Graph 1).

Graph 1: Gender of subjects



Male to female ratio being 2.33:1 (Graph 1). 44% of fractures were of neck of femur, 33% were pertrochantaric and 23% were subtrochantaric fractures (Graph 2). Mean Preoperative VAS score of all patients was 2.3900 SD .88643 with minimum VAS was 1 and maximum VAS was 5. Mean Preoperative VAS score of group A (with skin traction) was 2.5400 SD .83812 with minimum VAS was 1 and maximum VAS was 4 (Graph 3). In group B (without skin traction), mean Preoperative VAS score of group A (with skin traction) was 2.2400 SD .91607 with minimum VAS was 1 and maximum VAS was 5. Independent t test were applied to assess the mean difference between VAS score of 2 groups and was statistically non significant ( $t=1.709$   $p>.091$ ) (Table2).

Graph 2: Type of fracture



Preoperative VAS score

Group	N	Mean	Std. deviation	Min.	Max.
A	50	2.5400	.83812	1.00	4.00
B	50	2.2400	.91607	1.00	5.00

Graph 3: Box plot for Preoperative VAS Score of Groups

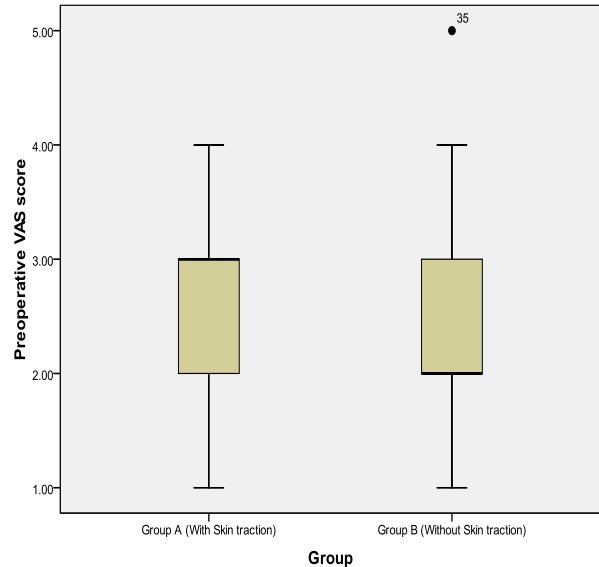


Table 1: Age of respondents case summaries and frequency. Age of respondent

Group	n	Mean	Std. deviation	Min.	Max.
A	50	46.8000	14.43493	27.00	74.00
B	50	45.8000	12.56331	26.00	74.00

Age of respondents

Valid	Frequency	%	Valid%	Cumulative%
25- 40 years	47	47.0	47.0	47.0
41-60 years	38	38.0	38.0	85.0
61-80 years	15	15.0	15.0	100.0

Table 2: Preoperative VAS Score - Independent Samples Test

Preoperative VAS score	Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
	F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.040	.842	1.709	98	.091	.30000	.17559	-.04846	.64846
Equal variances not assumed			1.709	97.235	.091	.30000	.17559	-.04849	.64849

## DISCUSSION

Proximal femoral fractures having a big contribution to musculoskeletal trauma burden at tertiary care centers are among the most common injuries that could be dealt only by surgical management. Since this type of injury typically seen in elderly individuals, this added the importance of comprehensive medical examination prior to surgery. Although frequency of hip fracture is very low in young individuals, so in elder group of patients, preoperative preparations may take longer than usual. In young patients hip fractures are caused generally by high-energy traumas. Therefore pain reduction during the preoperative preparatory period is important in hip fracture patients for both groups. As per traditional treatment, traction is believed to reduce pain, that's the reason skin traction is used in many hip fracture patients<sup>11,12</sup>. It is demonstrated in some studies that

skin traction does not provide any advantage in pain control, and that additional analgesic agents are required<sup>11,12,13,14,15,16,17</sup>. However, skin traction is still continued to applying in practice, possibly to create the impression that active measures are being taken for pain and fracture control<sup>2,8</sup>.

Resch and Thorngren found in their study that the patient pain decreased significantly after application of traction<sup>19</sup>. However, they also stated that a randomized study would be necessary to definitively conclude that traction actually did reduce pain rather than act as a placebo, since the use of a pillow was just as effective in alleviating pain. Although many studies have demonstrated the inferior efficacy of traction, none have evaluated its potential advantages nor the placebo effect of traction. In order to assess the placebo effect of

traction, we devised a method by which a skin traction kit could be applied without weight.

In one study efficacy of preoperative skin traction for hip fractures in a level II trauma center in Japan where many patients undergo delayed surgery. Eighty-one patients were randomized to be treated with skin traction (41 pts), or bed rest (40 pts). Preoperative pain was assessed by use of a visual analogue scale and the number of analgesics required. Fracture reduction was measured on the basis of leg-length and neck-shaft angle discrepancies on the radiograph on admission, a day before surgery, and after surgery. The mean time from admission to surgery was 7.5 days. Pain decreased markedly on the day after admission in both the traction and no-traction groups. No significant difference was found during the preoperative waiting period between the groups in either pain score or number of analgesics taken. No significant difference was found in radiographic data either before or after surgery, and satisfactory reduction was achieved after surgery irrespective of the use of skin traction<sup>19</sup>.

In my study Mean Preoperative VAS score of group A (with skin traction) was 2.5400 SD .83812 with minimum VAS was 1 and maximum VAS was 4. In group B (without skin traction), mean Preoperative VAS score of group A (with skin traction) was 2.2400 SD .91607 with minimum VAS was 1 and maximum VAS was 5. Independent t test were applied to assess the mean difference between VAS score of two groups and was statistically non significant. ( $t = 1.709$   $p > .091$ )

In another study in which 100 consecutive patients with hip fractures who met inclusion criteria admitted to the authors' institution, were enrolled. In that study fifty-five patients had femoral neck fractures, and forty-five patients had intertrochanteric fractures. The average patient age was seventy-eight years. Preoperatively all patients were randomly distributed into two intervention groups. One group was managed by placement of five pounds of skin traction on the injured extremity, whereas the second dealt with placement of a pillow under the injured extremity. Fifty patients were enrolled in each intervention group. Regarding results of this study and with respect to immediate post-intervention pain levels, patients treated with a pillow showed a trend toward better pain relief, as compared with patients treated with skin traction. But this was not statistically significant. As on the morning after admission, patients treated with a pillow had a statistically significant greater reduction in pain ( $p=0.04$ ). These patients also requested a statistically significant lower amount of pain medication ( $p < 0.01$ ).

## CONCLUSION

- There is no difference in postoperative pain reduction among hip fracture patients with skin traction and without skin traction.
- Routine use of skin traction in patients with hip fractures has no role in reduction of pain preop.

## RECOMMENDATIONS

Validity of the study needs that it should be conducted in multicentre. In this study skin traction was not compared with placement of pillow. So, the mean pain score can be compared by applying skin traction and with placement of pillow in patients with hip fracture.

## REFERENCES

1. Canale ST, Beaty JH, editors. Campbell's operative orthopedics 12<sup>th</sup> Ed. Philadelphia: Elsevier; 2008. p.2725-9.
2. Madni A A, Saqlain AH, Qureshi A. To find out the effectiveness of skin traction in reducing pain in patients with hip fracture prior to undergoing surgical intervention J.P.O.A. 2009; 21(1):11- 15.
3. Saygi B, Ozkan K, Eceviz E, Tetik C, Cengiz S. Skin Traction and Placebo Effect in the Preoperative Pain Control of Patients with Collumand Intertrochanteric Femur Fractures. Bulletin of the NYU Hospital for Joint Diseases 2010;68(1):15
4. Handoll HHG, Queally JM, Parker MJ. Pre-operative traction for hip fractures in adults. Cochrane Database of Systematic Reviews 2011;12: CD000168.
5. Shabat S, Gepstein R, Mann G, Kish B, Fredman B and Nyska M. Deep skin slough following skin traction for hip fractures. J Tissue viability 2009; 12(3): 108-12
6. Robert M.H, editor. Handbook of Neurologic rating Scales 2<sup>nd</sup>Ed. New York: Demos, 2011. p. 340.
7. Even JL, Richards JE, Crosby CG, Kregor PJ, Mitchell EJ, Jahangir AA, Tressler MA, Obrebsky, WT. Preoperative Skeletal Versus Cutaneous Traction for Femoral Shaft Fractures Treated Within 24 Hours, Journal of Orthopaedic Trauma. 2012; 26 (10): p.177–182.
8. Levi N. Is preoperative tibial traction responsible for peroneal nerve palsy in patients with fractured hip. Acta Orthop Belg 1998; 64 (3): 273-6.
9. Shabat S, Gepstein R, Mann G, Kish B, Fredman B and Nyska M. Deep skin slough following skin traction for hip fractures. J Tissue viability 2009;12(3): 108-12.
10. Harvey CV. Challenges of traction in critical care. A case study. Critic Care N u r s e Q 1998; 2 1 ( 2 ) : 1-1 3.
11. Anderson GH, Harper WM, Connolly CD, Badham, et al. Preoperative skin traction for fractures of the proximal femur. J Bone Joint Surg Br. 1993;75:794-6.
12. Yip DHK, Chan CF, Chiu PKY, et al. Why are we still using preoperative skin traction for hip fractures? Int Orthop. 2002; 26:361-4.
13. Finsen V, Borset M, Buvik GE, Hauke I. Preoperative traction in patients with hip fractures. Injury. 1992;23:242-4.
14. Jerre R, Doshe A, Karlsson J. Preoperative skin traction in patients with hip fractures is not useful. Clin Orthop Relat Res. 2000;378:169.
15. Rosen JE, Chen FS, Hiebert R, Koval KJ. Efficacy of pre-operative skin traction in hip fractures: a prospective randomized study. J Orthop Trauma. 2001;15:81-5.
16. Resch S, Bjärnetoft B, Thorngren KG. Preoperative skin traction or pillow nursing in hip fractures: a prospective, randomized study in 123 patients. Disabil Rehabil. 2005; 27: 1191-5.
17. Parker MJ, Handoll HH. Pre-operative traction for fractures of the proximal femur in adults. Cochrane Database Syst Rev. 2006 Jul 19;3:CD000168.
18. Billsten M, Besjakov J, Hyddmark U. Enquiry in Sweden on the use of traction preoperatively in patients with hip fracture and a radiological study on the effect of the traction on ten displaced cervical hip fractures. Acta Orthop Scand. 1996;67(Suppl 270):35.
19. Endo J, Yamaguchi S, Saito M, Itabashi T, Kita K, Koizumi W, Kawaguchi Y, Asaka T, Saegusa O. Efficacy of preoperative skin traction for hip fractures: a single-institution prospective randomized controlled trial of skin traction versus no traction. J Orthop Sci. 2013;18(2):250-5. doi: 10.1007/s00776-012-0338-1. Epub 2012 .