



## ROLE OF SUCTION DRAIN IN TOTAL KNEE ARTHROPLASTY

Dr Shubhendu Das

Assistant Professor, Orthopaedic department Murshidabad medical college&amp; hospital, Berhampore

Dr Anant kumar Garg\*

Associate Professor&amp; Head, Orthopaedic department Murshidabad medical college&amp; hospital, Berhampore \*Corresponding Author

## ABSTRACT

The use of suction drain in Total Knee Arthroplasty has been widely studied. Although there is no established evidence to support their use, in Total Knee Arthroplasty. In this prospective study we intend to do a comparative study between three different drain protocols in primary total knee arthroplasty. Patients were divided into three groups of 50 patients each, one group without any post-operative drain, another with post-operative suction drain for 24 hours and lastly the group with post-operative suction drain for 48 hours. We have evaluated the patients pre-operatively with knee range of motion, knee circumference, knee society score, functional knee score & VAS score. Patients who had undergone total knee arthroplasty with a post-operative suction drain were doing better. Putting drain after total knee arthroplasty does not cause any harm to the patients, rather it helps in rehabilitation of the patients in early post-operative period.

## KEYWORDS :

## INTRODUCTION

There are many literatures in national & international journals regarding the usage or non usage of drain in primary total knee arthroplasty & most of times the literature is divided in multiple issues regarding drainage. In this prospective study we intend to do a comparative study to see the surgical & functional outcome between three different drain protocols in primary total knee arthroplasty.

## MATERIALS &amp; METHODS

In this prospective non-randomised study Patients were divided into three groups of 50 patients each in respect of usage of drain (Romovac closed suction drainage system) post-operatively. Group A- operative wound was closed without a suction drain. Group B- operative wound was closed with a suction drain for 24 hours. Group C- operative wound was closed with a suction drain for 48 hours. Inclusion criteria: 1) all male or females undergoing primary Osteoarthritis of knee 2)All cases primary Osteoarthritis of knee 3)Pre-operative Haemoglobin >10, 4)Patients undergoing unilateral total knee arthroplasty. Exclusion criteria: 1)Pre operative fixed flexion deformity>20degree or varus / valgus deformity>30 degree 2)Patients with hemorrhagic disorders, patients on long term anticoagulants for previous thrombo-embolic disorder and patients with deranged coagulation profile 3)Patients with stiff knee (< 50° knee ROM) 4)Any previous ipsilateral kneesurgeries.5) Revision TKA. All patients are evaluated pre-operatively with detailed history, physical examination and radiological evaluation. Pre-operative haemoglobin, knee circumference at mid-patellar level, pain in VAS scale, knee society score & functional knee score are calculated for each patient

## RESULTS

All group of patient was followed up for period up to 1yr. Average patient's age in different groups were 65.86 ± 6.571 years in group A, 66.42 ± 7.094 years in group B and 66.3 ± 8.0413 years in group C and the difference was not statistically significant ( $p=0.921$ ). There was also no statistically significant difference in between three groups in relation to pre-operative knee flexion ( $p=0.850$ ) and fixed flexion deformity ( $p=0.153$ ). The pre-operative knee society score and functional knee score were significantly low in 48 hours drain groups ( $p=0.00$ ). Pre-operative and post-operative pain of the patient is noted by asking the patients to grade their pain according to the visual analogue scale after proper explanation to the patients. We have graded this VAS score as

poor pain (score of 7 or more), fair pain (score is 3 to 6), and no or mild pain or good pain relief (score 2 or less) Pre-operatively all patients in three different groups were having poor pain except one patient in each of the drain group who were having fair pain according to visual analogue scale. The mean pre-operative haemoglobin level was low (12.71g/dl ± 1.38) in patients in group B in comparison to others and which was statistically significant ( $p=0.00$ ). Mean pre-operative haemoglobin in group C was highest in between three groups with 13.93 g/dl ± 1.12. Incidentally the mean surgery time and the mean tourniquet time were significantly low in no drain group ( $p=0.00$ ).

## DISCUSSION

The orthopaedic literature contains many studies<sup>1-10</sup> which recommend the use of drains in total joint arthroplasty. However there are still studies<sup>6</sup> that implicate drains for increased infection rates. On the other hand there also exists a controversy regarding the duration of drain to be kept post-operatively. In our study we find that the post-operative blood loss was significantly more ( $p=0.00$ ) in patients with drains, though the blood loss in dressings was significantly more ( $p=0.00$ ) in patients without any post-operative drain. Haemoglobin level drop from its pre-operative value at post-operative day 3 was significantly more ( $p=0.00$ ) in case of patients with drain for 48 hours and the requirement of transfusion of blood post-operatively was not significantly different in this group. In 48 hour drain group the maximum amount of blood (82.34%) which has drained through suction drain is in first 24 hours. Though the haemoglobin drop at day 3 in 48 hour drain group was more, only 7 patients (14%) required blood transfusion. Pre-operative haemoglobin in this particular group was significantly more ( $p=0.00$ ) in comparison to other groups and the criteria for blood transfusion were set at a level where only few patients had reached. This particular finding is also supported by study of R. O. Sundaram ET al & Skand Kumar et al. Thus to summarise in our study we found that A] Patients with drain had significantly more total blood loss and drop in haemoglobin than compared to no drain group but this did not translate into increased requirement for blood transfusion. B] Patients with 48 hrs drains had significantly more blood loss as compared to 24 hrs drain group, however this difference did not translate into increased requirement of blood transfusion. Also both groups had no difference in blood loss in first 24 hrs with only 17.66% of loss occurring in the latter 24 hrs in the 48 hrs drain group.

**Soakage and Dressing change**

Kim et al and Esler et al had reported a significant increase in the amount of drainage from the wound site for the wounds treated without a drain, as assessed by the weight of the dressings during post-operative dressing change. In our study patients with no drain post-operatively were having more soakage in early post-operative days in comparison to others and the number of post-operative soakage dressing change was significantly more ( $p=0.00$ ) in group with no drain. About 44% of the patients in no drain group required soakage dressing change in post-operative day 2, day 3, day 4. So the results of our study is corroborating with the existing literature. There is no difference in the volume of blood loss and number of soakage dressing changes in between 24 hrs & 48 hrs drain group. We have not found any study regarding volume of blood in dressing and number of soakage dressing change in between two groups with 24 hrs and 48 hrs drain. So the results of our study is also corroborating with the existing literature.

**Swelling in the Knee, Wound Haematoma**

The pooled results of meta-analysis by Parker MJ et al had shown that there is no significant difference ( $p=0.54$ ) in post-operative haematoma formation whether drain was used or not in total joint arthroplasty. It had been theorised earlier that omitting drains would lead to haematoma formation and that then might lead to excessive pain, heaviness & stiffness in the knee in immediate post operative period and later on may be due to extravasations of blood in the peri-articular tissue and, subsequently, decreased mean range of motion. Results of our study is corroborating with this particular fact.

**Wound Infection**

In our study 14 % ( $n=7$ ) of the patients in no drain group were having postoperative minor wound complication like superficial infection, whereas there are only 4 to 6% of patients had suffered from such kind of complication in other groups though this incidence was also not statistically significant ( $p=0.149$ ). There was only one patient in no drain group who had deep wound infection which had not reached the level of statistical significance ( $p=0.365$ ). However the increased incidence of prolonged wound discharge following TKA is of some concern. So with reference to the risk of infection, we have not found any additional risk in any of the

**CONCLUSION**

total amount of blood loss is significantly more in 48 hours drain group in comparison to no drain or 24 hour drain group but the requirement of blood transfusion does not differ in between any of the three groups. Post-operative wound infection does not differ in any of the three groups. There is significant difference in range of motion in between no drain and any of the drain group. The percentages gain in range of motion at 1 year follow up in patients of no drain group though less in comparison to other two groups, the difference is not significant. There is significant difference in both knee society score and functional knee score in between no drain and drain group. Functional knee score does not differ in between 24 hrs & 48 hrs drain, however knee society score differs at 1 year follow up.

**REFERENCES:**

1. Reilly TJ, Gradisar IA Jr, Pagan W, Reilly M. The use of postoperative suction drainage in total knee arthroplasty. *Clin Orthop Relat Res.* 1986 Jul; (no 208).
2. A. Chandratreya, K. Giannikas And P. Livesley. To drain or not drain: literature versus practice, *J.R. Coll. Surg. Edinb.*, 43, December 1998.
3. Waugh TB, Stinchfield FE. Suction drainage of orthopaedic wounds. *J Bone & Joint Surgery (Am)* 1961; 43-A: 939-46.
4. Alexander JW, Korelitz J, Alexander NS. Prevention of wound infections. A case for closed suction drainage to remove wound fluids deficient in opsonic proteins. *Am J Surg.* 1976; 132:59-63.
5. Drinkwater CJ, Neil MJ. Optimal timing of wound drains removal following total joint arthroplasty. *J Arthroplasty.* 1995 April.
6. Willett KM, Simmons CD, Bentley G. The effect of suction drains after total hip replacement. *J Bone & Joint Surgery (Br)* 1988; 70-B: 607-10.
7. Magee C, Rodeheaver GT, Golden GT, Fox J, Edgerton MT, Edlich RF. Potentiation of wound infection by surgical drains. *Am J Surg.* 1976; 131:547-9

8. Esler CN, Blakeway C, Fiddian NJ. The use of a closed-suction drain in total knee arthroplasty. A prospective, randomised study. *J Bone Joint Surg Br.* 2003 Mar.
9. Weiss AP, Krackow KA. Persistent wound drainage after primary total knee arthroplasty. *J Arthroplasty.* 1993; 8:285-9.
10. Cerise EJ, Pierce WA, Diamond DL. Abdominal drains: their role as a source of infection following splenectomy. *Ann Surg.* 1970; 171(5):764-769.