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Revisiting Suction Drain in Primary TKR - A Necessary Safeguard or An Obsolete Practice

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Abstract

Introduction: Traditional use of suction drains in primary Total Knee replacement (TKR) is still in practice even with the evolving surgical techniques and postoperative care. Many studies have proven similar results without using drain in the past. This study aims to compare the results in our hospital and to find out the potential complications.

Aim: This study seeks to compare the use of drain versus no drain with regard to blood loss, transfusion rates, post-operative pain, wound complication and number of days of hospital stay in primary total knee replacement patients in Believers Church Medical College.

Materials & Methods: 100 consecutive patients with drain and without drain each fulfilling the inclusion criteria was taken from the database of our institution from 2022 January to 2022 December. A retrospective descriptive study was conducted with regards to tourniquet time, pre and post-operative hemoglobin level, blood transfusion rates, amount of drain, wound related complication and pain-score.

Results: TKR without drain had lower blood loss, transfusion rate, less postoperative pain and less hospital stay compared with those with drain however echymosis and effusion was present in few patients which subsided in 3 weeks without any intervention. This study showed no added advantage of using drain in relation to wound complication and postoperative rehabilitation. however, the drain related complication, increased blood transfusion and increased hospital stay may cause increased financial burden on patients.

Conclusion: This study showed early postoperative mobilization, less haemoglobin drop, low transfusion rates and lesser number of hospital stay in patients without drain. The study also showed no added advantage of using drain in primary total knee arthoplasty. As with the increasing environmental concerns and increasing cost of healthcare we as caregivers should be judicious in the use of drain(plastic)

when similar results can be achieved without it. However, more studies with larger cohort and longer follow-up may be needed to establish the results.

Keywords: Drain, Total Knee replacement, No Drain, Hemoglobin drop

Introduction

Total knee replacement (TKR) is a widely performed and highly effective surgical procedure for managing severe knee arthritis and other debilitating joint conditions [(1)]. As surgical techniques and postoperative care evolve, optimizing patient outcomes and minimizing complications are key priorities. A topic of ongoing discussion in orthopedic surgery is the role of suction drains in primary TKR. Traditionally, suction drains have been used to prevent hematoma formation, reduce postoperative swelling, and lower the risk of infection by facilitating the removal of excess blood and fluids from the surgical site [(2)]. However, the routine use of suction drains in TKR has come under scrutiny, with emerging evidence suggesting that their benefits may be limited. Potential drawbacks of suction drains include increased blood loss, delayed wound healing, and extended hospital stays, raising questions about their necessity in modern TKR practice [(3,4)]. This study seeks to compare clinical outcomes in primary TKR performed with versus without suction drains. By examining postoperative complications, recovery times, and patient satisfaction, we aim to assess whether suction drains contribute to better outcomes or if their use can be safely reduced or eliminated ultimately aiming to enhance patient care and surgical results.

Materials and Methods

100 consecutive patients with drain and without drain each fulfilling the inclusion criteria was taken from the database of our institution from 2022 January to 2022 December. A retrospective descriptive study was conducted with regards to tourniquet time, pre and post-operative hemoglobin level, blood transfusion rates, amount of drain, wound related complication and pain-score.

Inclusion Criteria: All unilateral and bilateral cruciate retaining primary total knee replacement patient.

Exclusion Criteria: Inflammatory Arthritis, Patients with prior Knee surgeries, Use of augments like screws, wedge or stem, Patients without recorded data.

100 patients each with drain and without drain was taken in two groups (Group A and Group B) and the Pre- and post-operative hemoglobin, blood transfusion rate, postoperative pain, tourniquet time, wound complication and number of hospital stay was compared. All patients received 1 gm tranexamic acid injection 20 min prior to incision along with peri-articular cocktail (Ropivacain, Adrenalin, Morphine). Group B received additional Intra-articular tranexamic acid (500mg) after the wound closure. Tourniquet was released before wound closure and haemostasis was achieved in group A. In Group B, tourniquet was released after closure of retinaculum. All patients received (Epidural - bilateral, Spinal + Block for unilateral) for 24 hrs. All patients receive bilateral foot pump and Inj. Heparin 5000 IU S/C BD starting 6 hrs after surgery as DVT prophylaxis. Patients with drain was mobilized on POD 2 after removal of the drain while patients without drain was mobilized on POD 1.

Group A patients was discharged on POD 3 to 5 for unilateral and POD 5 to 7 for bilateral while in group B all patient is discharged on POD 3 once self-ambulant without wound discharge. If wound soakage present then inj. Heparin was stopped and tab Aspirin 75 mg started along with one stat injection on IV 500 mg tranexamic acid.

Both group patients were asked to continue crepe bandage and tab aspirin 75mg for 1 months and was

asked to keep ice packs for 30min every 2hrs for 3 weeks.

Results and Discussion

Out of the 200 patient, 100 knees were bilateral total knee surgery patient in single sitting, 51 were right side and 49 were left side TKR. Out of the 100 patients in drain group 26 were male and 74 were female and in No drain group 20 males and 80 females. Mean age (Drain 66yrs, no drain 64.5yrs), Tourniquet time Bilateral (Drain 152min, No Drain 142min), Unilateral (Drain 90min, No Drain 86min) were comparable in both groups.

Mean Pre-Operative Hemoglobin (Hb) (Drain 12.9mg/dl, No Drain 12.9mg/dl), Post-Operative Hb (Drain 10.7mg/dl, no drain 11.7mg/dl) were evaluated and average Hb Drop (Drain2.22mg/dl, no drain 1.16mg/dl) and pain score of 3-5/10 (Drain n=50 and No Drain n=33) was calculated with shows significant drop in Hb and increased pain. Blood transfusion rates were calculated and 23 patients with drain was given blood transfusion (1-pint n=18, 2-pint N=5) and no patients without drain required blood transfusion.

In our study we had four patients whose drain was not functioning and two patients with drain stuck in the tissue which required reopening for drain removal. No evidence of infection was seen in both groups however there was extensive echymosis with no drain group (n-59) which subsided in 3 weeks without intervention. Dressing soakage was also present (n=4) in Drain group and (n=7) in no drain group. We also compared the average hospital stay (drain – 6 days, no drain 4days) which shows a significant reduction in no drain group.

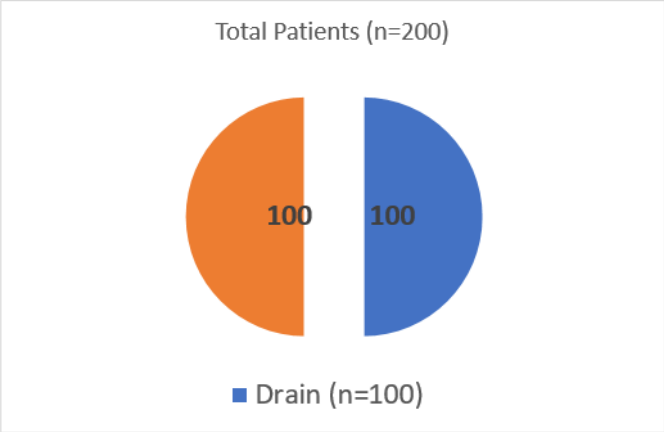
The role of suction drains in primary total knee replacement (TKR) has been a topic of considerable debate in orthopedic surgery. Traditionally, these drains have been used to prevent the accumulation of blood and fluids at the surgical site, which are believed to reduce the risk of complications such as hematoma, infection, and excessive swelling [(5)]. However, the necessity and effectiveness of suction drains in improving clinical outcomes have come under scrutiny as surgical techniques and postoperative care protocols have evolved. In this study, we compared the outcomes of primary TKR performed with and without the use of suction drains. Our findings suggest that the routine use of suction drains may not confer significant advantages in terms of reducing postoperative complications. The absence of a drain did not result in an increased incidence of hematoma, infection, or other complications traditionally associated with fluid accumulation. This challenges the conventional wisdom that drains are essential for preventing these issues. Moreover, patients in the no-drain group experienced slightly faster recovery times and shorter hospital stays compared to those with drains. This may be attributed to the reduced need for wound care and drain management, as well as the potential psychological and physical benefits of eliminating the discomfort associated with having a drain in place. The reduction in hospital stay also has implications for healthcare costs, suggesting that omitting drains could contribute to more efficient resource utilization.

However, our study also highlights the need for a nuanced approach to drain use in TKR. While the data suggest that drains may not be necessary for uncomplicated cases, there may be certain patient populations or surgical scenarios where drains could still be beneficial. For example, patients with coagulation disorders, those undergoing revision surgery, or cases with extensive soft tissue dissection might still benefit from the use of suction drains. It is important to acknowledge the limitations of our study, including the relatively short follow-up period and the focus on a

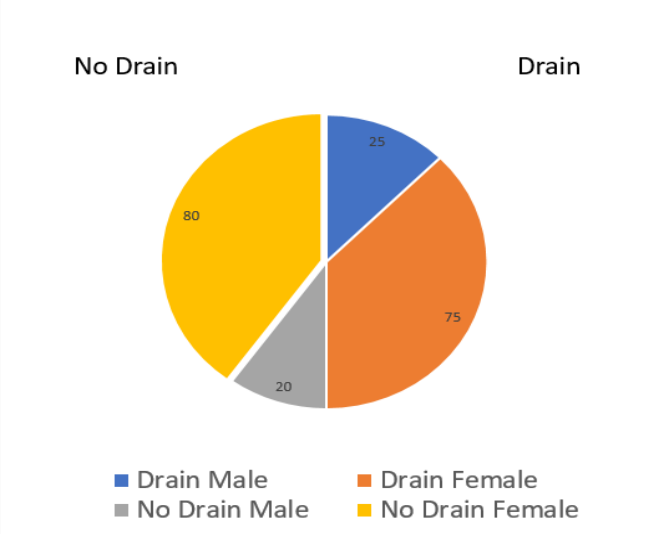
specific patient population. Longer-term studies are needed to assess the potential delayed effects of not using drains, such as late-onset infections or issues related to prosthetic stability. Additionally, future research should consider incorporating patient-reported outcomes, as these provide valuable insights into the subjective experiences of patients and their satisfaction with the surgical procedure.

Graphs and Table

Graph 1:



Graph 2:



Graph 3:

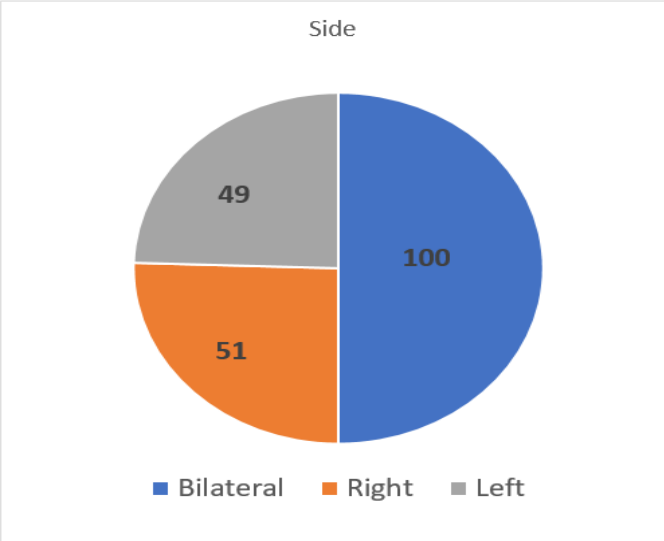


Table 1:

	Drain	No Drain
Mean Age	66	64.5
Tourniquet time Bilateral	152	142
Tourniquet time Unilateral	90	86
Pre-Op Hb	12.9	12.9
Post Op Hb	10.7	11.7
Avg Hb Drop	2.22	1.16
Pain Score (3-5)	50	33

Conclusion

In conclusion, our findings support the growing evidence that suction drains may not be necessary for all patients undergoing primary TKR. The potential for faster recovery, shorter hospital stays, and reduced healthcare costs without increasing the risk of complications suggests that a more selective approach to drain use could be beneficial. As with the increasing environmental concerns and increasing cost of healthcare we as caregivers should be judicious in the use of drain(plastic)

when similar results can be achieved without it. Surgeons should weigh the risks and benefits of drain use on a case-by-case basis, considering the individual patient's characteristics and the specifics of the surgical procedure.

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