



## Routine Use of Suction Drain not Required in Primary Total Knee Replacement Surgery

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### KEYWORDS

### ABSTRACT:

**Introduction:** Historically, total knee replacement has been performed under a tourniquet since its inception. However, there are several complications associated with the use of a tourniquet, such as ischemic limbs, calcified blood vessels, and nerve palsy, as well as an increase in postoperative drainage. To prevent hematoma formation in the knee joint and excess fluid accumulation, suction drains were placed in situ. Nevertheless, the primary complication associated with the use of drains is an increased risk of infection.

**Materials & Methods:** Our report features 100 cases of total knee replacement that were performed without using a tourniquet or drain. For single knee replacement, the average blood loss is approximately 300 ml, and there is no need for blood transfusions or drain placement since a crepe bandage was applied for a tamponade effect. The post-operative rehabilitation was excellent, and intra-operative antibiotics prophylaxis was effective.

**Results:** Immediately following surgery, patients were instructed to move about on day one based on their individual pain thresholds. Early mobilisation resulted in lesser accumulation of fluid and hence hematoma formation is lesser. They reported experiencing less pain and improved function. The majority of patients reported manageable postoperative discomfort and enhanced joint flexibility. Moreover, all of the patients in the study recovered without any issues or complications.

**Conclusions:** In primary Total knee replacement surgery does not necessitate the utilization of a romovac suction drain.

### INTRODUCTION:

Historically, total knee replacement surgery was initially performed under a tourniquet when it was first introduced in the early 1970s. This method provides a bloodless visual field for surgeons, which is a significant advantage<sup>1</sup>. Nevertheless, tourniquets have been associated with certain complications, including ischemic limb, venous thromboembolism, calcified vessels, and nerve palsy, as well as increased post-operative drainage<sup>2,3</sup>.

Total knee arthroplasty (TKA) is a surgical procedure that is commonly used to treat patients with severe knee

arthritis<sup>4</sup>. This procedure has been shown to produce positive results for patients in many cases. However, there is ongoing debate about the use of drains during TKA procedures, as there is no clear consensus on their necessity<sup>5,6</sup>. Despite this, modern surgical techniques have been developed to minimize complications and promote faster healing<sup>7</sup>.

The utilization of drains in TKA procedures is associated with certain elevated risks. Particularly, there have been reports of heightened risks for retrograde infection, increased blood loss, delayed rehabilitation, and on occasion, drain displacement<sup>8,9</sup>. In cases where drain breakage occurs following surgery for TKA, it may be



necessary to perform wound revision and drain extraction. Drains are used in order to prevent the formation of a hematoma in the knee joint and to remove excess fluid through suction applied directly to the site. However, the primary complication associated with the use of drains is the increased risk of infection<sup>10</sup>.

#### MATERIALS & METHODS:

We report 100 instances of total knee replacement procedures performed without resorting to the use of a tourniquet. During the arthrotomy and subsequent bleeding, the blood is cauterized, allowing the completion of the total knee replacement procedure without the need to inflate the tourniquet or use a drain. The application of a crepe bandage after each dressing serves as a tamponade effect, reducing blood accumulation, and functioning as a substitute for a drain. The average amount of blood loss for a single knee replacement is approximately 300 ml, and no blood transfusions are required. By avoiding complications associated with the use of tourniquets, such as venous

thromboembolism and fat necrosis, postoperative rehabilitation is excellent, and antibiotic prophylaxis is effective when administered intraoperatively.

The collected data was entered in Microsoft Excel. Coding of the variables was done. Analysis was done using SPSS software (Version 27, IBM). Descriptive statistics was used. Association between categorical test. The outcomes of the treatment groups were compared using a test to reach the hypothesis, P value less than 0.5 was considered significant.

#### RESULTS:

The total sample size of the present investigation was one hundred patients. Immediately following surgery, patients were instructed to move about on day one based on their individual pain thresholds. The majority of patients reported manageable postoperative discomfort and enhanced joint flexibility. Moreover, all of the patients in the study recovered without any issues or complications.

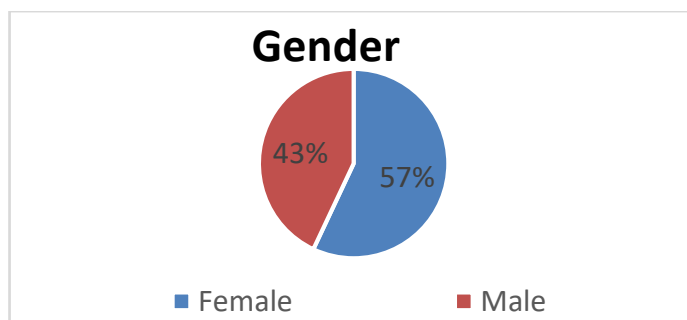
**Table 1: Age distribution among the study participants**

AGE	FREQUENCY	Percentage (%)
41. – 60 years	45	45
>60 years	55	55
Total	100	100

The sample consists of 100 individuals, segmented into two age categories: 41 to 60 years, and over 60 years. Of the total population, 45 individuals (36%) fall within the 41 to 60-year age range, and the largest group, comprising 55 individuals (55%) is over 60

years old. This distribution indicates a higher representation of older individuals within this sample, with nearly half of the participants being over 60 years old, while the smallest group is those under 60 years.

**Chart 1: Gender distribution among the study participants**





Among the study participants, the gender distribution was, 57% female and 43% males who underwent the total knee replacement.

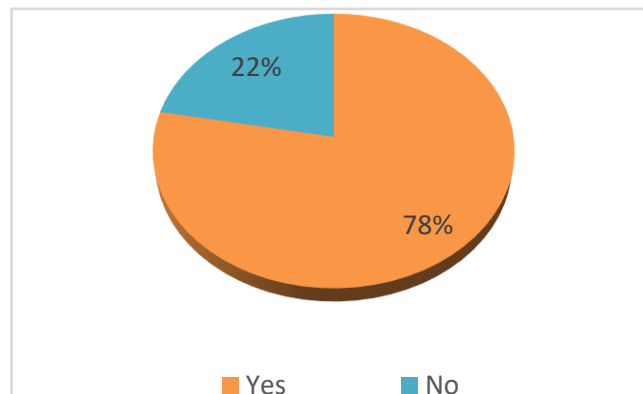
**Table 2: Post operative mobilization on day 1**

Post operative mobilization D1	Frequency (n)	Percentage (%)
Yes	81	81
No	19	19
Total	100	100

The post-operative mobilization status on the first day (D1) following a procedure within a sample of 100 individuals. It shows that 81 individuals (81%) were able to mobilize on the first day post-operation, while

19 individuals (19%) did not mobilize. This indicates that a significant majority of the sample was mobile immediately after the operation, reflecting a positive outcome in terms of early mobilization.

**Chart 2: Details on increased range of motion**



Among the study patients 78% patients had increased range of motion

**Table 4: Details of Complication among the study participants**

Complication	Frequency (n)	Percentage (%)
Present	0	0
Absent	100	100

According to the data, no individuals in the sample experienced any complications, as indicated by a frequency and percentage of 0% for the "Present" category. Conversely, all 100 individuals (100%) are

reported to have no complications, categorized as "Absent." This clear distribution demonstrates that complications are entirely absent in this particular sample, suggesting all patients recovered as



complication-free group.

## DISCUSSION:

Jeon, Y.S et al<sup>11</sup> have discussed the utilization of closed suction drainage is increasingly being questioned by many surgeons worldwide, with a notable decline in its use. The primary reason for its use has been the fear of hematoma formation and subsequent infection. The age-old belief that draining the wound prevents the accumulation of blood in different compartments of the wound post-operatively, which is the cause of hematoma formation, has been the basis for this practice. Hematoma, being a good culture medium for bacteria with low levels of opsonic proteins, inhibits normal phagocytic activity and delays the normal healing process. Theoretically, using a drain does not allow the tamponade effect to occur, which is an important step in filling the dead space in an operated wound. Various methods have been employed to determine the level of post-operative hematoma formation, including weighing post-operative dressings, using ultrasound of the wound, and single-photon emission computed tomography. However, none of these methods have demonstrated a significant role for the drain in preventing hematoma formation. In fact, there is always some amount of hematoma that is left unevacuated in the wound, regardless of whether a drain is used or not. Therefore, there seems to be no logical reason to use a drain in terms of hematoma prevention.

Infections are a significant concern following Total Knee Arthroplasty, and it is crucial to address them promptly. In our study, we observed a single patient in each group with early superficial infection, and both were successfully treated with oral antibiotics. A recent meta-analysis revealed an infection incidence of 0.5% in the drain group and 1.2% in the non-drained group, which is comparable to a randomized trial that reported superficial infection rates of 2.9% and 4.8% in the drained and non-drained groups, respectively. However, we did not observe any statistically significant difference in terms of superficial wound infection between our groups. Notably, there were no cases of deep wound infection in our study.

Persistent discharge from the wound site and

ecchymosis have been found to be statistically significant in a few studies where drain were not used. Although more patients in the study group required a change of dressing in the first 24 hr and had ecchymosis when compared to the control group, the final results were not statistically significant in our study. Discharge from the wound or the drain insertion site further adds to the total cost.

**CONCLUSION:** Total knee replacement surgery typically does not necessitate the utilization of a romovac suction drain.

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