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Closed Suction Drainage in Hip Arthroplasty – An Observational Study

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ABSTRACT

Objective: *To compare the clinical and functional results of using closed suction drainage (CSD) vs not using suction drainage in hip arthroplasty. It will evaluate how well patients recover both physically and in their daily activities.* ***Materials and Methods:*** *This study included 72 patients who had a total hip replacement surgery at the Himalayan Hospital fromember 2020 toch 5, 2022. The patients were put into two different groups. In Group A, there were 33 patients with CSD, and in Group B, there were 39 patients without CSD.* ***Results:*** *The data from the patients' medical records and tests show that Group B had more dressings needed compared to the other group. This difference was statistically significant (p=0. 033). However, there was no difference between the two groups in terms ofrease in hemoglobin or hematocrit levels, need for a blood transfusion, delay in removing sutures, length of surgery, hip score, pain score, or infection at the surgery site. Visual Analog Score (VAS), Modified Harris Hip Score (HHS), surgical site infection, as well as the clinical and laboratory data in this study statistically show more dressing reinforcement in Group B (p=0.033). There were two cases of infection in Group B, where the wounds were treated with antibiotics.* ***Conclusion:*** *The observed benefit of this study shows that using Closed suction drainage (CSD) after hip surgery reduces the need for extra dressing.*

KEYWORDS: *Closed suction drainage (CSD), Hip arthroplasty, Blood Loss, wound Infection.*

INTRODUCTION

To alleviate pain and improve mobility among individuals struggling with hip joint issues, total hip arthroplasty, a frequently performed surgical procedure, is undertaken to replace the hip joint. More and more people are getting conditions that disable their hip joints, like osteoarthritis, inflammation, avascular necrosis, and fractures in the femur neck. These conditions make it difficult for people to do their daily activities and increase the chances of getting sick or dying in the affected population. Hip arthroplasty is a surgery where the joint is exposed by cutting through the soft tissues andarating the muscles. Then, the femoral canal and the acetabulum are prepared. Bleeding is common in these areas and it is hard to stop it completely, which often leads to the formation of a hematoma[1-3].

To help make hip surgery safer and improve healing afterwards, drains are used to prevent problems like blood collecting under the skin, infections, slow healing, and wounds splitting open after the operation. Drains are used to remove body fluids (such as blood, fluids, pus) and help tissues come together[4]. The employment of drains can be traced back to Hippocrates' time. Using a drain in orthopedic surgery and hip replacement surgery is still uncertain and is a topic of disagreement. One of the advantages of utilizing closed suction drainage is that it has the potential to reduce infection rates and prevent wound dehiscence, ultimately resulting in enhanced

healing. It does this by reducing the formation of blood clots and pooling of blood[5].

The introduction of Closed suction drain (CSD) in orthopaedic surgery was attributed to Waugh and Steinfeld. They found that patients who had a drain used had a lower rate of infection. However, the use of CSD in orthopaedic surgery can have some risks. They can cause infections to spread backwards and allow bacteria to go deeper into surgical wounds. They can also act as a foreign object that weakens the body's natural defenses and makes surgical site infections more likely. Drains can cause more bleeding after surgery and lead to a greater need for receiving someone else's blood. This happens because drains reduce the ability for blood to clot and stop bleeding. Sometimes, there is a continuous leaking coming from the drainage hole[6].

The goal of the study is to compare the results of using a closed negative suction drainage during hip replacement surgery versus not using any suction drainage. The examination will involve a thorough evaluation of the functional and clinical outcomes of both methods.

MATERIAL AND METHODS

A total of 72 patients who underwent hip replacement surgery at Himalayan Hospital fromember 2020 toch 2022 were examined in this research. Patients were divided into two groups: Group A, who had a close suction drain, and Group B, who had no drain. We did not include 2 patients who had another surgery on their hip.

We gave a medicine called Prophylactic-IV-Cefuroxime 1.5 gm to the patients 30 minutes before the surgery started. We continued giving this medicine every 12 hours until 48 hours after the surgery. The surgeons used standard anterolateral and posterior approaches for all the patients, as per their own preferences. A total of 60 hip replacements without cement and 12 hip replacements that were a combination of cemented and non-cemented techniques were performed. Patients were regularly moved and exercised with the help of physical therapy. On the second day after surgery, a test was done to check for any blood loss. The test checked the levels of Hematocrit and Hemoglobin.

After the surgery, patients with low hemoglobin levels (<9gm/dl) received blood transfusions. We removed drains and sent the tips for testing bacteria growth. We evaluated their dressings every day to check if they needed to be changed and if there were any signs of infection.

We measured pain using a visual scale on the first day (39.7%) We also measured the size of the thigh before and after the operation on the first day (39.7%). After the operation, we used the Modified Harris Hip Score to measure hip function, and we followed up with the patient after 6 months.

RESULTS

The patient's selection for where the drain was placed was chosen randomly. The same criteria were used for all patients in both the groups (i.e., Drain Group (GroupA) and No-drain Group (GroupB)) in this study. As indicated by Table 1, there were no variations in the residual p-values for any of the criteria (mean age, male/female, and time or duration of surgery).

Table 1: Demographic criteria comparison between both groups

	No-drain Group	Drain Group	P-value
Averageage (in years)	42.87+-11.35	46.82+-12.67	0.143
Male/female	29/10	22/11	.967

Duration of surgery	137.28+-12.61	137.97+-9.31	0.791

There was no noteworthy variation discovered in theline of hemoglobin/hematocrit levels 48 hours after the surgery among the two groups, according to this study.In both groups, there were no disparities detected in the rates of infection at the surgical site or in the delay of suture removal. Two patients in Group B had an infection at their surgery site. The infection was treated by changing their dressing as well as antibiotics based on the results of a culture test. We found that the drain group had less dressing reinforcement ($p<0.05$) Additionally, there was no noticeable difference in VAS (Visual Analog Scale) and Modified Harris Hip Score (MHHS), as indicated in Table 2.

Table 2: Clinical and functional parameters comparison between both groups

Parameters	**No- drain group**	**Drain group**	**P-value**
Asepsis Score	2	0	1
Blood transfusion	5	6	0.529
Dressing reinforcement	8	1	0.033
Suture removal delay	4	1	0.366
Fall in Hb levels (average)	7.4+-368	6.88+-6.13	0.662
VAS on POD	2.59+-0.82	73+-1.12	0.077
Mid-thigh circumference on POD7	15.31+-2.07	15.1+-1.53	0.627
Fall in Hct levels (average)	24+-128	2.14+-1.31	0.526
Modified HHS after 6-month follow-up	78.79+-4.16	79.61+-4.3	0.419

DISCUSSION

Many doctors often use a tube to drain fluid from the hip during hip replacement surgery. Many people still use them in joint replacement surgery, even though some people have concerns about their use. This research was done on 72 patients who had their first hip surgeries.

In this study, the average age of the patients in the drain group was 46.82+-12.67 years and in the non-drain group was 42.87+99 years. There were more males in the study, specifically 51 cases (70.83%), which is similar to a previous study conducted by [7]. Using drains during surgery result in a longer surgery time. However, the use of drains does not make a difference in the time it takes for the procedure overall. Another investigation indicated that the exclusion of drains led to a slightly shorter surgical procedure, yet this disparity did not hold statistical significance (p-value = 0.168). The average level of hemoglobin before and after surgery was not found to be significantly different in both groups ($p = 0.684$). This finding is similar to what other studies have found[6,8].

Both groups had similar rates of receiving a blood transfusion and their blood concentration after surgery was

also similar. Other studies have also found that there is no difference in the blood measurements related to drainage. Signs of infection were observed in two patients from the drain group; however, no additional surgical procedures were necessary. This is similar to findings from other studies by Walmsley et al., and Bartosz et al., [9,10,11].

In four patients, the tests done on drain tips showed positive results. However, none of these patients developed a surgical site infection. This is similar to a previous study by Khanal et al., which included 30 patients who had orthopedic surgery and were followed up for one year. In that study, nine patients had positive results on drain tip tests, but only four of them initially showed signs of infection on the second day[12,13].

None of these patients developed either a surface or deep infection. Drains might stop the thighs from swelling and make the thigh pain go down[14-18]. We observed no major distinctions between the thigh size and the VAS score in our research. This is similar to what other studies have found. After the surgery, the functioning of the patients was evaluated using a test called Modified Harris hip score. There was no notable difference between the two groups in terms of their recovery after six months, which aligns with findings from other studies. Similar findings were discovered in previous studies, which concluded that utilizing less dressing reinforcement in the drain group produced comparable outcomes[19-24].

CONCLUSION

Usage of Closed Suction drainage (CSD) in total hip arthroplasty did not show any of much anticipated statistically significant advantage. After the surgery, the functioning of the patients was evaluated using a Modified Harris hip score. There was no notable difference between the two groups in terms of their recovery after six months. However, lesser dressing reinforcements when considering all the parameters, were found in the drain group.

CONFLICT OF INTEREST

There is no conflict of interest among authors or any other sources.

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