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A prospective randomised comparative study of drainage versus non-drainage in primary total hip arthroplasty

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Abstract

A study was conducted to compare blood loss, need for blood transfusion and complications in drainage and non-drainage groups in primary total hip arthroplasty. Forty patients undergoing total hip arthroplasty were randomly allocated into twenty patients in each of drainage and non-drainage groups. All the operations were performed by one speciality surgical team with same pre-intra operative and post-operative protocol. Haemoglobin, volume of blood transfusion, superficial and deep infection and Harris hip score wer eassesed. Blood loss (mean) in the drainage and non-drainage groups were 220.1 ml and 234.7 ml respectively. Hb levels were more in the non-drainage group on 1st, 3rd and 7th day, but on day 7, they were not statistically significant. 10% of cases in non-drainage group developed infection in which 5% are superficial and the other 5% are deep infections, 10% of cases developed superficial infection in the drainage group. The incidence of superficial infection was higher in non-drainage group, however there was no significant difference in the length of the hospital stay. 3 (15%) patients needed blood transfusion in the drainage group and 2 (10%) patients needed blood transfusion in the non-drainage group, mean volumes were 1.6 units in drainage group and 1.5 units in non-drainage group respectively and it's not statistically significant.

Keywords: Primary total hip arthroplasty, non-drainage group, drainage group

Introduction

Total hip replacement is one of the most successful procedures in the last century [1]. As the surgical procedure involves reaming of proximal femur it results in haematoma formation that may increase incision tension resulting in wound discharge that may offer a good medium for the growth of microorganisms [2, 3]. Drains are routinely employed following total hip arthroplasty to prevent haematoma formation that may result in the devastating complication of total hip arthroplasty i.e. deep infection. Nevertheless some studies have reported that drainage doesn't reduce haematoma formation and risk of infection and some studies have reported that drainage increase the blood loss and the need for transfusion and may provide entry portal for microorganisms causing wound infection [3, 4].

Several studies have found no statistical difference between drainage and non-drainage groups in terms of haematoma formation and post-operative complications [5, 6] and studies

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have reported the results favouring them [3, 4,5,6]. In India since there are certain drawbacks like shortage of blood, high risk for transfusion reactions and very high expectations for the operation, we pay at-most attention to blood loss, transfusion reactions and complications after total hip replacement.

Our objectives are to compare functional outcome by modified Harris hip score [7], blood loss, need for blood transfusion and infection rates in the two groups one being in which drainage is used and the other without drainage.

Materials and Methods

This study included twenty patients of each in drainage and non-drainage groups who have been operated for primary total hip arthroplasty in Gadag institute of medical sciences, gadag from Inclusion criteria were all the cases of primary total hip arthroplasty due to osteonecrosis of femoral head or osteoarthritis of hip joint, cases of non-union of fracture neck of femur in elderly population We have excluded cases of revision THA, patients undergoing bilateral THA, patients with blood cell disorders, cases of uncontrolled HTN, cases with history of recent myocardial infarction, stroke, liver failure, renal failure and BMI >35. The institutional ethical committee clearance was obtained. The design and nature of the study was explained to all the patients included in the study. All the operations were performed by one surgical team under spinal anaesthesia or combined spinal and epidural anaesthesia. A standard surgical approach with standard surgical techniques was employed. Before closure of the incision, one of the members of the anaesthesia team opened a sealed opaque envelope where instructions on whether to employ a drain were present and these instructions was written by a nurse who was not involved in this study. All the wounds in both the groups were covered by a sterile dressing without compression. Drains were removed 24 hrs. postoperatively in the drainage group. All the patients were encouraged to perform ankle ROM exercises immediately after the surgery and ambulation with partial weight bearing on second post-operative day with the assistance of walker.

Criteria for post-op blood transfusion will be HB<8 g/dl or < 10 g/dl with signs of hypovolemia (drop in blood pressure less than 100 mm of hg, tachycardia >100 beats/min, urine output <30 ml/hr.) [8]. Evidence of superficial infection (redness, swelling and presence of discharge) and deep infection will be noted. The duration of hospital stay and range of motion of hip were assessed preoperatively and at the time of discharge from the hospital. Blood loss will be calculated on the Hb balance method [9]. Post op haemoglobin will be calculated on 1st 3rd and 7th day. All the patients were followed in Arthroplasty clinic at 2 weeks, and then 1st 2nd and 3rd month postoperatively where the complications such as infection, dislocation and pain were recorded.

Results

There were 20 patients in each group. All the patients withstood the procedure well without any intra op complications. Blood loss (mean) in the drainage and non-drainage groups were 220.1 ml and 234.7 ml respectively. p = 0.07. There was no statistical difference between the two groups in terms of transfusion rate/ average volume of blood transfusion. The ROM values at the time of discharge and at 2 weeks, 1, 2 and 3 months were shown in the fig. 10% of cases in non-drainage group developed infection in which 5% are superficial and the other 5% are deep infections, 10% of cases developed superficial infection in the drainage group. The incidence of superficial infection was higher in non-drainage group, however there was no significant difference in the length of the hospital stay. 3 (15%) patients needed blood transfusion in the drainage group and 2 (10%) patients needed blood transfusion in the non-drainage group, mean volumes were 1.6 units in drainage group and 1.5 units in non-drainage group respectively and it's not statistically significant.Oral antibiotics are used to treat

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superficial infection and no deep infections were found. No other post-op complications are seen.

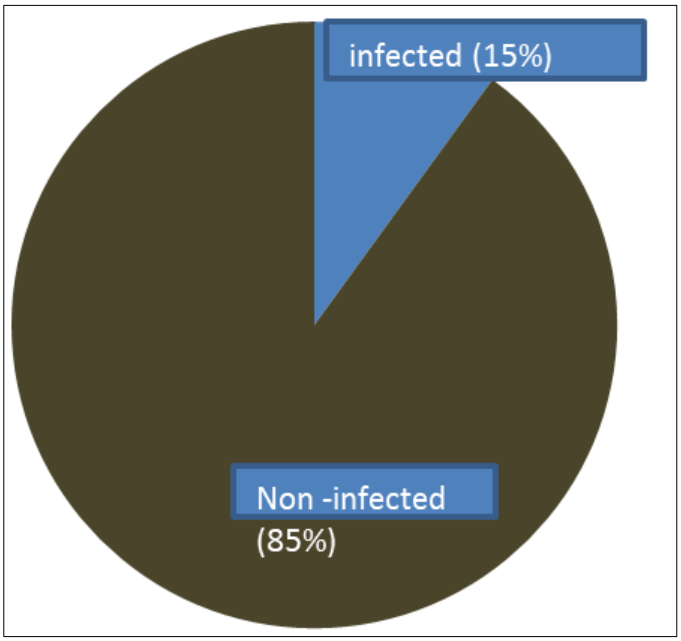

Fig 1: Showing infection rate in non-drainage group

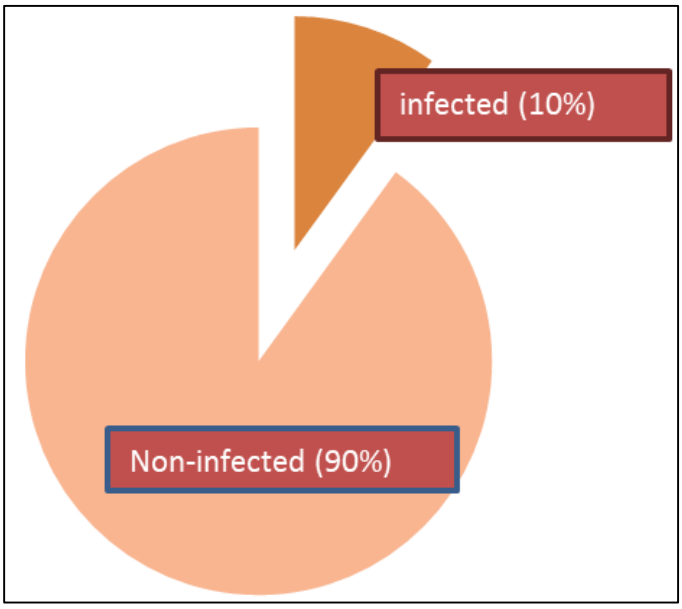

Fig 2: Cases showing infection rate in drainage group

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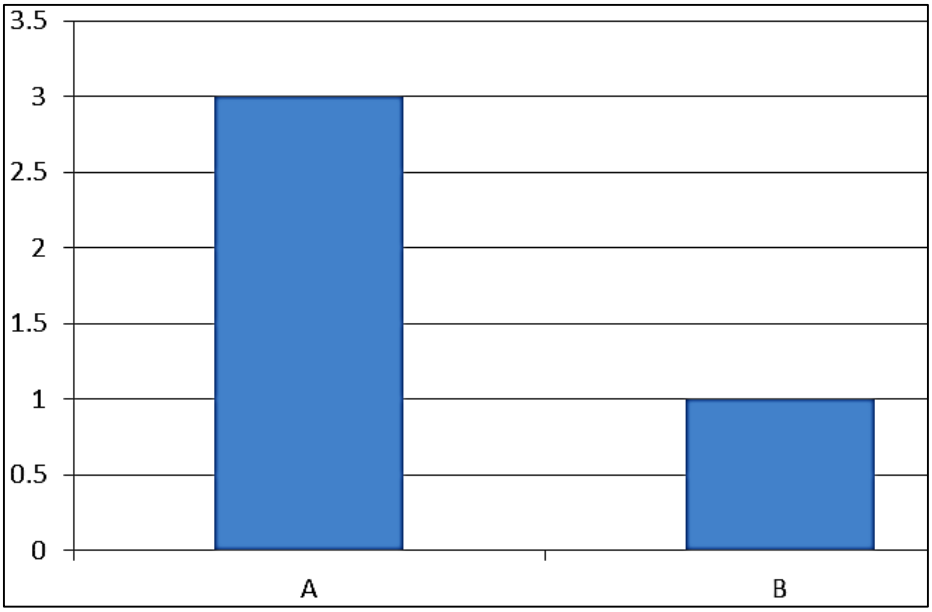

Fig 3: Showing infection rates in non-drainage (group B) and drainage (group A)

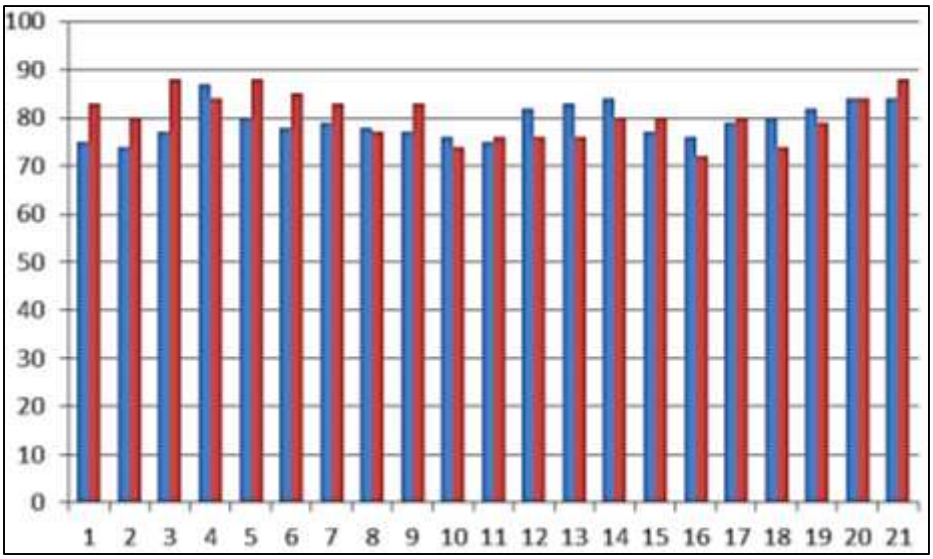

Fig 4: Harris hip score in drainage (group A) and non-drainage (group B)

Discussion

There has been documented in the literature that drainage will decrease infection rates [10, 11], but Raves *et al.* documented that drainage has led to retrograde entry of microorganisms in 20% of cases if drains are not removed within 72 hours. Ravikumar, K.J *et al.* in their "Drainage versus Non-Drainage in Total Hip Arthroplasty. A Prospective Randomized Study" reported that 53.8% of cases developed infection 38.4% being superficial and 15.3% cases with deep infection and 8.3% cases developed deep infection in the drainage group [12] where as our Walmsley *et al.* documented that the transfusion rate in the drained group was significantly higher than that in non-drained group (32% vs 26.3%, P = 0.042) [13], and Hallstrom and Steele documented that transfusion rates in drainage and non-drainage groups of 57.3% and 43%, respectively [14]. Some studies have shown that drainage increases the blood loss thus increasing the need for blood transfusion [9] where as in our study mean blood loss was 220.1 ml and 234.7 ml respectively in each of the groups respectively and there was no statistical difference between blood loss and the need for blood transfusion in both the

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groups. In our study blood loss was assessed by comparing hemoglobin levels in the preoperative period and on post-operative day 1, day 3, 7 and found that drainage group may have had increased blood loss in the immediate postoperative period but at the post-operative day 7, there was no statistical difference between the groups,. In our study even though the drainage group had better ROM at the hip joint in the early post-operative period till 1 month compared to the non-drainage group but at the end of 3 months there was no statistical significance which correlates with a study by Kim *et al.* [15].

Conclusion

We conclude that non-drainage may have certain benefits like reducing the blood loss in the early post-operative period, it has not shown any benefits in the need for the blood transfusion or the volume of the blood transfused and it increases the chances of superficial and deep infection and decreases the early post-operative mobility, we recommend the use of drainage after total hip arthroplasty even though there is no documented evidence that it reduces the chances of deep infection.

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