

Compare the Frequency of Surgical Site Infections in Patients Undergoing Hip Surgery with Closed Suction Drain Placed At Surgical Site and Without Drain

SAGHIR AHMED¹, FIDA AHMED BALOCH², IRSHAD AHMED³, IRFAN AHMED⁴, BILAL ELAHI⁵, SHAKEEL AKBAR⁶

¹Assistant Professor (Orthopedic Surgery) Teaching Hospital, Panjgor Balochistan

²Assistant Professor (General Surgery) BMCH, Quetta

³Senior Registrar (General Surgery), Jhalawan Medical College, Khuzdar Balochistan

^{4,5}Medical Officer (Orthopedic Surgery) BMCH, Quetta

⁶Assistant Professor (Anatomy) Jhalawan Medical College, Khuzdar Balochistan

Corresponding author: Dr. Saghir Ahmed, Email Address: doctorsaghir@gmail.com, Cell No: +923341662362

ABSTRACT

Introduction: Hip trauma is a debilitating event that leads to a major limitation in patient's functional ability. The incidence of hip fractures increases with advancing age and are more common in old age individuals. Closed-suction drainage has been routinely used in total hip arthroplasty to prevent hematoma formation and surgical site infections (SSI).

Objective: To compare the frequency of surgical site infections in patients undergoing hip surgery with closed suction drain placed at surgical site and without drain.

Study Design: Randomized controlled trial.

Place and Duration: The study was completed at department of Orthopedic Surgery Unit III, Bolan Medical College Hospital Quetta, Pakistan. The duration of study was from 1-April-2016 to 31-October-2017.

Subjects and Methods: A total number of 176 patients who underwent hip arthroplasty were included in this study. Group A (n=88) patients underwent hip surgery with placement of drain and Group B patients underwent hip surgery without the placement of drains. Data analysis was carried out using SPSS v20.0. Chi-square test was applied to compare surgical site infections in drain group and without drain group. Effect modifiers were controlled by stratification. Post stratification Chi-square test was applied taking P-value <0.05 as significant.

Results: The mean age of patients in this study was 42.26 (SD 9.86) years. There were 135 males (76.7%) patients in this study and 41 (23.3%) female patients. The mean duration of fracture was 39.41 (SD 7.74) days. There were 63 (35.8%) patients who presented with greater/lesser trochanteric fractures, 64 (36.4%) presented with sub-trochanteric fractures and 49 (27.8%) were presented with inter-trochanteric fractures. SSIs occurred in 7 patients in whom drain was inserted after surgery and in only 2 patients in whom drain was not inserted (p-value 0.08). There was no effect of confounder variables on the occurrence of SSIs.

Conclusion: The risk of surgical site infections is same in patients undergoing hip surgery with closed suction drain placed at surgical site and without drain.

Keywords: Hip fractures, Hip arthroplasty, Closed suction drains, Surgical site infections.

INTRODUCTION

Hip trauma is a devastating occurrence that results in a significant reduction in a patient's functional ability [1, 2, 3, 4]. Hip fractures are commonly referred to as proximal femur fractures, and they include the following types of fractures: greater/lesser trochanteric, sub trochanteric, intertrochanteric, and neck of femur. A person's risk of hip fracture grows with age, and they are more common in people over the age of 65. Hip fractures in young people are frequently the result of high-energy trauma [2], which is why they are so common.

Surgery-related site infection (SSI) is defined as an infection that develops within 30 days of the surgical procedure. In orthopaedic procedures, it has the potential to affect either the incision site or the deep tissues. SSI is related with an increased risk of death and morbidity, as well as an increase in the cost of health-care services [3, 4]. In order to reduce the occurrence of SSI, several aseptic interventions are implemented, one of which is the drainage of wounds. The concept of draining wounds can be traced back to Hippocrates, who utilised wooden tubes to drain the operation wounds [4] during his practise. In the realm of orthopaedic surgery, Waugh and Stinchfield were

the first to employ wound drainage technique [5]. Following that, the use of drains swiftly extended throughout the entire field of orthopaedic surgery.

Closed-suction drainage has become standard practise in total hip arthroplasty and other surgical procedures on the theory that it effectively reduces the formation of hematoma, that it helps to reduce post-operative pain and limb swelling, that it helps to accelerate wound healing, and that it helps to prevent infection [6, 7]. However, several studies have failed to demonstrate a statistically significant difference between the drained and untrained patients, despite extensive investigation. The use of closed suction drainage has been questioned by many authors, who have concluded that it may be more harmful than advantageous [8, 9]. The researchers found that the frequency of surgical site infections (SSI) was 7.84 percent in the closed suction group and that there were no cases of SSI in the sans drain group in their study [8]. Other researchers have come to the conclusion that closed suction drainage is advantageous in hip surgery [10-13]. There is a great deal of disagreement about the use of closed suction drainage in orthopaedic surgery, and we only have a few dates open in Pakistan for discussions on

this subject. Moreover, in our facility, closed sutures are typically put after hip surgery. In order to determine if the use of closed suction drainage in hip surgery is advantageous or harmful to our patients, we intend to perform this study in order to make better decisions in the future for the welfare of our patients.

MATERIAL AND METHODS

This randomized controlled trial was conducted at department of Orthopedic Surgery Unit III, Bolan Medical College Hospital Quetta, Pakistan and duration of study was from 1-April-2016 to 31-October-2017. Total 176 patients of both gender with ages 20 to 60 years planned to undergo hip surgery with some sort of implant placement e.g. Total hip Arthroplasty and Hemiarthroplasty. HIV positive patients, patients having infection locally other than the surgical site, and patients with systemic infections e.g. blood stream infections were excluded.

Patients will be randomly allocated into two equal groups by Draw randomization method. Group A: underwent hip surgery with placement of drain and Group B: was allotted to the patients without placement of drain.

Both procedures were performed according to departmental protocols by senior consultants having minimum 5 years of post-fellowship experience. I (the investigator) served as assistant in all procedures. In Group A patients a drain was inserted at the end of surgery and in Group B patients no drain was inserted at the end of surgical procedure. Frequency of surgical site infections in the follow up period of one month was recorded on a predesigned Proforma (Annexure).

Data analysis was carried out using SPSS v20.0. Mean and standard deviations were calculated for quantitative variables like age, and duration of fracture to surgery. Categorical variables like gender, location of fracture, type of surgery and surgical site infections were calculated and presented as frequency and percentage. Chi-square test was applied to compare surgical site infections in drain group and without drain group. Chi-square test was applied taking P-value <0.05 as significant.

RESULTS

The mean age of patients in this study was 42.26±9.86 years. The minimum age was 20 years and maximum age was 60 years. There were more males as compared to females in this study. There were 135 males (76.7%) patients in this study and 41 (23.3%) female patients. The mean duration of fracture was 39.41±7.74 days.

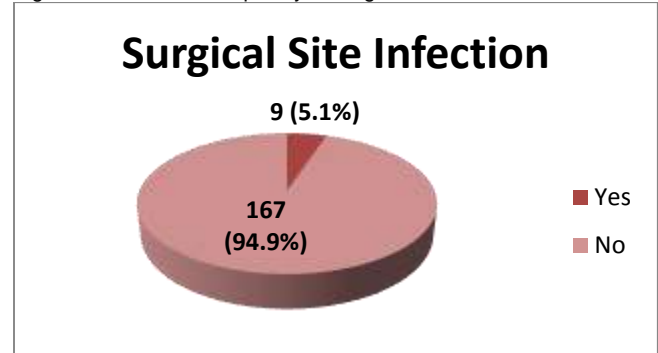
Table No 1: Baseline details of all the patients

Variables	Frequency No.	%age
Mean age (yrs)	42.26±9.86	-
Fracture Duration (Days)	39.41±7.74	-
Gender		
Male	135	76.7
Female	41	23.3
Types Of Fracture		
Trochanteric	63	35.8
Sub-trochanteric	64	36.4
Inter-trochanteric	49	27.8
Surgical Procedures		
Hip-arthroplasty	129	73.3
Hemi-arthroplasty	47	26.7

The minimum duration was 21 days and maximum duration was 60 days. Regarding types of fractures, there were 63 (35.8%) patients who presented with greater/lesser trochanteric fractures, 64 (36.4%) presented with sub-trochanteric fractures and 49 (27.8%) were presented with inter-trochanteric fractures. Regarding type of surgical procedure, total hip-arthroplasty was performed in 129 (73.3%) patients and Hemi-arthroplasty was performed in 47 (26.7%) patients. (Table 1)

Surgical site infections (SSIs) occurred in 9 (5.1%) patients, while no infection occurred in remaining 167 patients (94.9%). (Figure 1)

Figure No 1: Overall frequency of surgical site infection



On comparison of surgical site infections in patients who underwent hip arthroplasty with drain and without, the rate of surgical site infections was high in patients with drain. SSIs occurred in 7 patients in whom drain was inserted after surgery and in only 2 patients in whom drain was not inserted. Although this difference in the frequency of SSIs was not statistically significant with a p-value of 0.08. (Table 2)

Table No 2: Comparison of Surgical Site Infection between Drain and Without Drain Group.

Surgical Site Infection (SSI)	Group A (Hip Surgery with Drain)	Group B (Hip Surgery with Without Drain)	P-value
Yes	7	2	0.08
No	81	86	

DISCUSSION

There is still widespread use of drains following total hip arthroplasty even though their only apparent benefit is a reduced need for dressing changes [14]. Over the past decade, this method has been re-examined in several randomised studies, but no clear hazard or advantage has been found. If a drain isn't used, wound leakage looks to be greater, but it's important to determine if this is just a nuisance or is linked to significant morbidity [15]. It's not uncommon for studies to indicate an increase in the occurrence of wound haematomas, leg edoema, and bruises in the absence of a drain [16].

A typical surgical procedure is the use of closed suction drainage. Draining a wound is not a new idea. According to Hippocrates, he used a wooden tube for wound drainage [4]. In orthopaedic surgery, Waugh and Stinchfield were the first to advocate the use of a draining operation. Retrospective studies on the prevalence of wound infection following orthopaedic procedures led to

their decision to drain [5]. After then, drains were used in all fields of orthopaedic surgery quickly. Draining the surgical wound seemed like a good idea. Because the trabecular bone and the intramedullary canal are exposed, accurate hemostasis is difficult to accomplish. A hematoma forms, increasing the pressure on the surrounding tissues. This is inevitable. Blood flow and the healing of the surgical wound are negatively impacted by an increase in pressure. Additionally, hematomas provide an ideal substrate for bacterial growth [6,17]. Hemorrhoids impair the capacity of phagocytic cells to clear the body of germs. Due to the difficulty in reaching the germs in the haemorrhage, phagocytic cells are unable to remove them from the body as quickly. Hematoma's low opsonic protein content reduces the phagocytic cell's ability to degrade hematoma [18]. Draining the surgical site to minimise or at least limit hematoma development so becomes sensible in order to avoid surgical wound infection.

There was a fresh wave of study around the end of the twentieth century. These studies have cast doubt on the logical process of drainage and its use in hip arthroplasty, among other things. There are several harmful repercussions to draining. Drain tubes can get contaminated, causing bacteria to spread around the incision. Drains can also mistakenly be sutured to nearby tissues, making it difficult to remove them after surgery. As a result, draining may demand a larger amount of transfusions. Many surgeons have changed their practises and reconsidered the need for drainage following total hip arthroplasty as a result of these recent studies.

In present study, we evaluated the risk of post-operative surgical site infections (SSI) in patients who underwent hip arthroplasty with insertion of drain and without drain. In our study, SSI occurred in 7.9% patients in whom drains were inserted and in only 2.3% patients in whom drains were not inserted. Zhou et al. in their meta-analysis concluded that the use of drains after hip arthroplasty may prove more harmful as compared to its beneficial effects. This meta-analysis included 22 randomized controlled trials consisting of 3186 patients [19]. However these authors did not found any significant difference in the risk of SSIs in patients with drain and without drain. Koyano et al. concluded that closed suction drains should be inserted in all hip arthroplasty patients because these accelerate the process of wound healing and also reduce local inflammation in these patients [20]. Parker et al. in a meta-analysis also did not found any significant difference in the frequency of post-operative infections who underwent surgery with drains versus without drains [21].

Kumar et al. did not found any incidence of post-operative SSI in patients who underwent hip arthroplasty with drains and without drains [22]. Several other randomized controlled trials have failed to show any significant or detrimental effects of drains in patients of hip arthroplasty. Saleh et al. concluded that hematoma formation and persistent post-operative drainage are the independent predictors of the development of surgical site infections after hip surgery [23].

In our study, we also did not found any significant effects of drains in patients who underwent hip arthroplasty in our institution.

CONCLUSION

The risk of surgical site infections is same in patients undergoing hip surgery with closed suction drain placed at surgical site and without drain.

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