

ORIGINAL ARTICLE

Postoperative Infection in Arthroscopic ACL Reconstruction Using Hamstring AutograftABBAS KHAN¹, AKHTAR HUSSAIN², AHMAD ZEB³, YASIR MEHMOOD⁴, FARMANULLAH⁵, ZAIN ULLAH⁶¹Medical officer services hospital Peshawar²Assistant professor, Peshawar Medical College, Peshawar³Medical officer, khyber teaching hospital Peshawar⁴Medical officer services hospital Peshawar⁵Medical officer khyber medical college Peshawar⁶Medical officer jamrud hospital District KhyberCorresponding author: Akhtar hussain, Email: ahorho@gmail.com**ABSTRACT****Background:** Because of the increasing number of participants in sports activities and traffic accidents, the frequency of anterior cruciate ligament (ACL) injuries has been increasing. Arthroscopic ACL reconstruction, which is widely used in the treatment of complete ACL tears, is an effective method for preventing chronic instability and early degenerative arthritis.**Objective:** To determine the postoperative infection in arthroscopic ACL reconstruction using hamstring autograft**Methodology:** This study was retrospective study carried out at the department of orthopaedics, Afridi Teaching Hospital, Peshawar for a period of six months from February 2022 to July 2022. The postoperative infection status of all the included patients was taken from the hospital record. IBM SPSS version 23 was used to conduct all statistical analyses.**Results:** In the current study, a total of 60 patients were included. There were 51 (85%) males and 9 (15%) females in our study. Based on the rate of infection amongst 60 patients the frequency of infection was 2 (3.33%).**Conclusion:** Infection after arthroscopic ACL reconstruction using hamstring autograft is a relatively infrequent but devastating complication for patients. Better knowledge of the proper treatment protocols will contribute to improved quality of care for patients.**Keywords:** Postoperative infection; arthroscopic ACL reconstruction; hamstring autograft**INTRODUCTION**

Because of the increasing number of participants in sports activities and traffic accidents, the frequency of anterior cruciate ligament (ACL) injuries has been increasing. Arthroscopic ACL reconstruction, which is widely used in the treatment of complete ACL tears, is an effective method for preventing chronic instability and early degenerative arthritis. But various complications associated with ACL reconstruction have been reported. In particular, infection in the joints after ACL reconstruction has been shown as a severe complication that, when not treated properly, can lead to permanent dysfunction of the joint due to articular cartilage destruction, ankylosis, and graft failure¹. In the literature, the reported frequency of infection following ACL reconstruction is relatively low at 0.14% to 1.7%^{1,2}. The overall prevalence of septic arthritis after ACLR has been documented at 0.14–2.25% of patients³⁻⁷. Following ACLR, septic arthritis presents clinically as a painful knee joint with restricted range of motion, prolonged effusion, localized erythema, and a temperature that is often above 38 °C⁸⁻¹². Septic arthritis is a medical emergency that requires immediate treatment, as any delay might result in graft failure, damage to the articular cartilage, as well as joint impairment. Therefore, having standardized procedures and algorithms for treatment and diagnosis is crucial. Within a few weeks following the index surgery, patients often report with joint pain and edema along with raised inflammatory markers. White blood cell count, C-reactive protein and erythrocyte sedimentation rate are often included in the diagnostic algorithm together with joint aspiration like leukocyte count, gram staining, anaerobic and aerobic culture, Acid-Fast staining. Numerous treatment methods have been suggested, but surgeons usually agree that arthroscopic irrigation and debridement (I&D) with continuous antibiotic administration for four to six weeks is the most effective approach³⁻⁷. The appropriate course of therapy has not yet been decided; while several algorithms have been proposed, there is still disagreement over the most effective approach³⁻⁸. Although the chances of infection are rare, an infection has the potential to cause lasting, devastating effects on the patient: a pro- longed hospital stay, an unfavorable post-reconstruction outcome, or even a compromise of graft preservation. Hence, though rare, it is a complication that necessitates careful consideration and proper treatment at an early stage. The relatively low incidence rate of infection after ACL reconstruction means that studies on this topic are sparse. And

because of the conflicting opinions regarding the risk factors associated with infection and the proper treatment, difficulties in establishing a standardized gold standard of treatment exist. The purpose of this study was to analyze the frequency of infection after ACL reconstruction.

MATERIALS AND METHODS

This study was retrospective study carried out at the department of orthopaedics, Afridi Teaching Hospital, Peshawar. The study duration was six months from February 2022 to July 2022. The sample size was 60 patients based on WHO sample size calculator. The study was approved from the hospital ethical and research committee. The inclusion criteria in our study were all the patients of either gender in age range of 18-60 years and admitted for arthroscopic ACL reconstruction in the orthopedic ward of the hospital. All the patients with in hamstring autograft was used were included only. The exclusion criteria for our study were all the patients with autoimmune disorders, cancer, diabetes and patients in which hamstring autograft was not used. Patients with multiligamentous surgeries, revision ACL surgeries and patients with ACL surgery with repair of meniscus root were also excluded from the study. As the study was retrospective so all the required information's like demographic detail and medical history was taken from the hospital record. Due to retrospective nature of the study, there was no need to take informed consent from the participants. The postoperative infection status of all the included patients was taken from the hospital record. Knee effusion, nausea, fatigue and systemic fever are characteristics of local and systemic indicators of infection following primary ACL reconstruction. Laboratory diagnosis like ESR and CRP and having a minimum of one wash also indicate infection. To diagnose the patients, there was no radiological examination done. Every operation was carried out in the same operating room, which maintains a consistent temperature of between 18 - 20 °C and has laminar airflow with a positive and hepa filter. In the surgery, a saline solution was employed as a cleaning agent. IBM SPSS version 23 was used to conduct all statistical analyses. Means and standard deviation were computed for variables like age and laboratory tests while frequency and percentages were computed for variables like gender and infection rate.

RESULTS

In the current study, a total of 60 patients with arthroscopic ACL reconstruction using hamstring autograft were included. Based on gender distribution, there were 51 (85%) males and 9 (15%) females in our study. (Figure 1) The mean age with \pm SD was 33.7 \pm 5.21 years. Based on age distribution, 20 (33.33%) patients were 18-30 years old, 30 (50%) patients were in age range of 31-45 years while 10 (16.67%) patients were 46 to 60 years of age. (Figure 2) Based on the rate of infection amongst 60 patients with arthroscopic ACLR using hamstring autograft, the frequency of infection was 2 (3.33%). (Figure 3) Based on type of infection, deep joint infection was observed in both the patients (100%, n=2) with postoperative infection. Based on type of microorganism isolated, methicillin resistant Staphylococcus aureus were isolated in both the patients (100%, n=2) with postoperative infection.

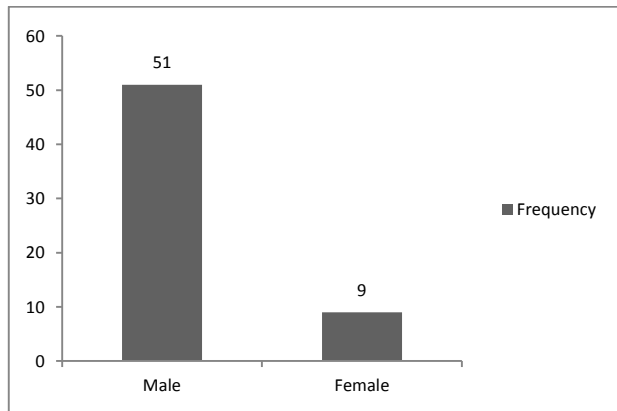


Figure 1: Distribution of patients based on gender

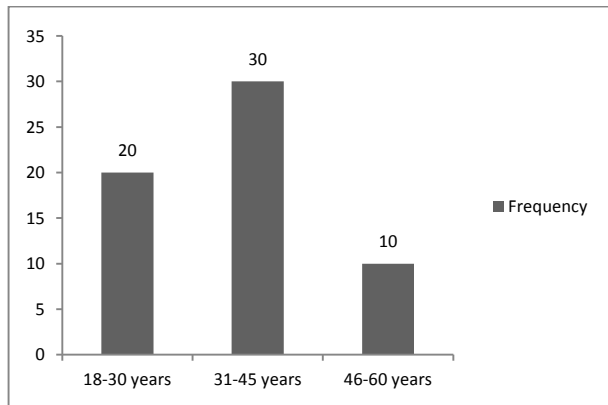


Figure 2: Distribution of patients based on age

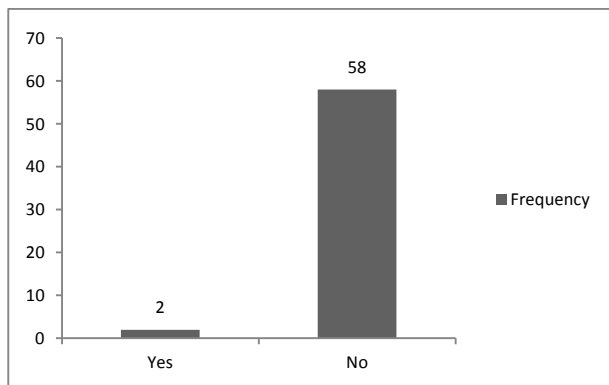


Figure 3: Overall frequency of infection in arthroscopic ACL reconstruction patients using hamstring autograft

DISCUSSION

Infection following an arthroscopic surgery is very rare such that infection after ACL reconstruction occurs only in 0.14% to 1.7% of cases ^{1, 2, 13, 14}. Direct graft contamination appears to be the more frequent cause of infection after ACL reconstructions, though the primary infection cause remains to be recognized ¹⁵. The significance of minimizing skin-graft contact is brought home by this. The graft's preparation is another important concern. During graft preparation, a significant prevalence of 12% contamination was observed ¹⁶. Hamstrings tendon autograft has been linked to greater infection rates amongst the grafts. Given that it is still the most popular graft type to be collected, this information has significant consequences. In the current study, a total of 60 patients with arthroscopic ACL reconstruction using hamstring autograft were included. Based on gender distribution, there were 85% males and 15% females in our study. The mean age with \pm SD was 33.7 \pm 5.21 years. Based on age distribution, 33.33% patients were 18-30 years old, 50% patients were in age range of 31-45 years while 16.67% patients were 46 to 60 years of age. Based on the rate of infection amongst 60 patients with arthroscopic ACL reconstruction using hamstring autograft, the frequency of infection was 2 (3.33%). Based on type of infection, deep joint infection was observed in both the patients (100%, n=2) with postoperative infection. Based on type of microorganism isolated, methicillin resistant Staphylococcus aureus were isolated in both the patients (100%, n=2) with postoperative infection in our study. A similar retrospective study was carried out by *çapraz bağ et al.* on patients who underwent arthroscopic ACL reconstruction using hamstring autograft. The reported the overall prevalence of infection as 4.7% which is almost in accordance with our study. Majority of the patients in their study were males. The majority of organisms isolated in their study were coagulase negative staphylococci ¹⁷.

After an ACL reconstruction, postoperative knee joint infections are known to occur infrequently, with rates ranging from 0.14 to 1.4% ^{12, 17-20}. In contrast, professional athletes were said to have rates as high as 5.7% ²¹. While infections are uncommon, they are difficult to cure since they need multiple surgeries, extensive antibiotic use, removal of grafts and hardware, and further revision surgery ^{7, 15, 19, 20}.

Only a few studies have been published in the literature looking at the relationship between the kind of graft utilized in ACL reconstruction and the prevalence rate of infection ^{15, 22}. In a reconstructive analysis of 1615 primary ACL reconstructions performed between 1994 and 2002 during an 8-year interval, Judd et al. ¹⁵ identified 11 postoperative infections (0.68%) in the patients. The overall incidence of illnesses in this research was determined to be 2.6% during a 3-year span between 1999 and 2001. According to their analysis of the occurrence of infection depending on the chosen graft type, all infections developed in the group receiving hamstring tendon autograft for ACL reconstruction ¹⁵. The lengthier preparation period is regarded as a risk factor for contamination because hamstring tendon autograft processing requires more time than that of BTB autograft and allografts ^{23, 24}. Additional risk factors for contamination include skin contact during graft insertion and the multifilament suture often utilised in the fabrication of hamstring tendon grafts ²². Even both grafts have identical preparation, insertion, and fixation methods, it is still unclear why bacterial contamination and rates of infection are lower in soft tissue allografts than hamstring tendon autografts. The limited sample size in our research is one of its main limitations. For a better understanding of the problem, more research with a high sample size should be conducted.

CONCLUSION

Infection after arthroscopic ACL reconstruction using hamstring autograft is a relatively infrequent but devastating complication for patients. Better knowledge of the proper treatment protocols will contribute to improved quality of care for patients. A prompt diagnosis of the infection following anterior cruciate ligament

reconstruction is important for its management. We believe that immediate irrigation and arthroscopic debridement followed by administration of antibiotics for 4 to 6 weeks is a beneficial treatment modality for both graft preservation and infection treatment.

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