Case Report | Trauma International | 2021 January-June; 7(1): 19-21

Chronic Tibial Tunnel Infection Following ACL Reconstruction: A Case Report and Review of the Literature

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Abstract

Introduction: Rupture of the anterior cruciate ligament (ACL) is a common injury in active people and one of the most common knee injuries in sports. Foreign body granuloma with concomitant infection is a rare complication in ACL surgery. Very few cases have been reported on it. We present a young patient with a chronic discharging sinus at a surgical site on the tibia in a diabetic patient and its successful management.

Case Report: A thirty-two-year-old male presented to us with a persistent discharging sinus at the surgical site following an Anterior Cruciate Ligament (ACL) reconstruction two years back. Since then, he developed wound infection at the incision site created for graft harvesting, which kept on discharging sero-purulent discharge even with several antibiotics and local dressing courses. There was no stiffness or instability in the knee. We did a follow-up arthroscopic evaluation of the joint and debridement of the wound. A portion of hamstring graft and non-absorbable suture with unhealthy granulation tissues were found subcutaneously during the surgery. A partially resorbed bioscrew with unhealthy granulation tissue was observed in the tibial tunnel. After thorough debridement of the site, the wound completely healed.

Conclusion: Surgical site infection and foreign body granuloma should be considered and treated accordingly if the patient presents with persistent discharging sinus at the surgical site in ACL reconstruction

Keywords: Anterior cruciate ligament reconstruction; ACL; Surgical site infection; Tibial tunnel.

Rupture of the anterior cruciate ligament (ACL) is a common injury in active people and one of the most common knee injuries in sports. It is estimated that the annual incidence of an ACL injury is about 1 in 3,000 among the USA's general population. That means more than 150,000 new ACL ruptures annually [1]. Though this surgery has an excellent, predictable outcome, complications do occur. Posterior wall blows out, medial femoral condyle articular cartilage damage, arthrofibrosis, knee stiffness, extension lag, infection are common complications of such arthroscopic knee surgery. Foreign body granuloma with concomitant infection is a rare complication in ACL surgery. Very few cases have been reported on it [2, 8, 9, 10].

We present a young patient with a chronic discharging sinus at a surgical site on the tibia in a diabetic patient and its successful management.

Case Report

A thirty-two-year-old male patient, known diabetic, presented with the complaint of persistent discharging sinus at the surgical site for two years (Figure 1). He had undergone an ACL reconstruction two years back; since then, he developed a wound at the incision site created for graft harvesting. It kept on discharging seropurulent discharge even with several courses of antibiotics and local dressing.

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There was no stiffness in the knee or other features of instability. We did an arthroscopic evaluation of the wound's joint and debridement (Figure 2). The portion of hamstring graft and non-absorbable suture with unhealthy granulation tissue was observed subcutaneously during the surgery. A partially resorbed bioscrew with unhealthy granulation tissue was observed in the tibial tunnel (Figure 3A, 3B).

The bone tunnel examination showed osteosclerosis of the bone tunnel wall without destruction. There was no clear communication to the surrounding bone marrow and between the bone tunnel and joint, which indicated that the reconstructed ligament was conserved in the joint. After thorough debridement of the site, the wound completely healed (Figure 4). In subsequent follow up he had no limitations in activities of daily living and returned to normal activities.

Discussion

Infection is one of the dreaded complications in ACL reconstruction. Post-operative infection is a rare, however, challenging complication after arthroscopically assisted ACL reconstruction. The incidence of infection has been reported to range from 0.1% to 1.7% among retrospective studies [2]. It has been found that hamstring grafts are more likely to get infected than bone-patellar tendon-bone grafts. There is a spectrum of conditions that may follow post-operative infections. Infection of the tibial tunnel is rare, and very few cases have been reported to date. Biologic complications related to biodegradable interference screws include pretibial cyst formation, bone tunnel widening, and inflammatory reactions [3].

Hematoma at the tibial tunnel might be an origin of infection in sub-acute and late cases. Several other complications have been

Trauma International ISSN 2455-538X | Available on www.traumainternational.co.in | DOI- 10.13107/ti.2021.v07i01.014

Figure 1: Purulent discharge is observed from the surgical site - proximal part of the right leg

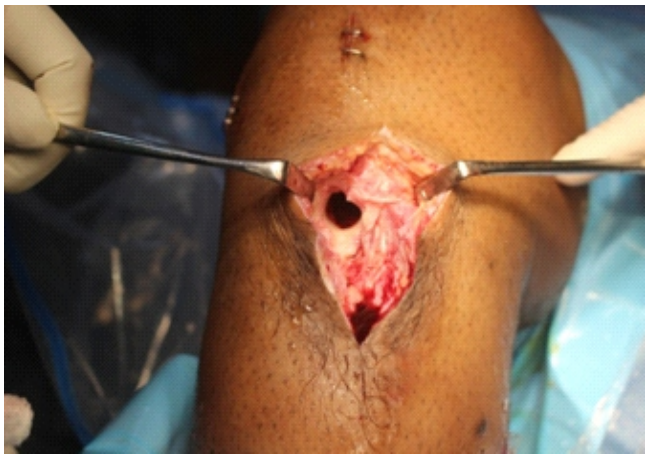

Figure 3A: Purulent discharge is observed from the surgical site - proximal part of the right leg

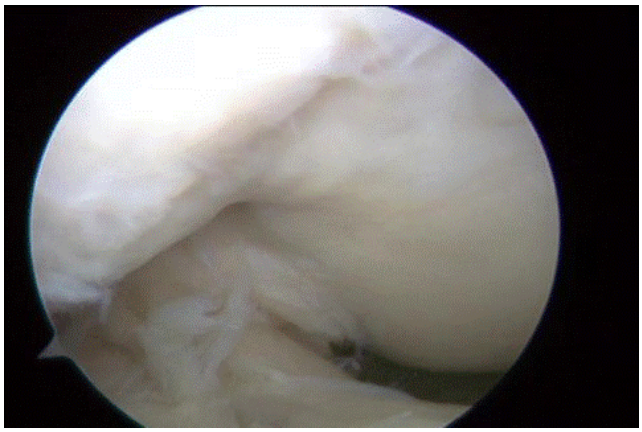

Figure 3B: Arthroscopic view of reconstructed ACL

Figure 2: Intraoperative photo showing the infected soft tissue

Figure 4: Wound healing by primary intention after debridement

documented in the literature: screw breakage, fixation failure, screw migration, osteolysis, and joint effusions [4]. Frank et al. reported a case of osteomyelitis at the distal femur after ACL reconstruction, and knee reconstruction with a modular hinged endoprosthesis was ultimately required [5]. According to previous reports, even when post-operative infection occurs after ACL reconstruction, the reconstructed ligament can be conserved. A cure can be achieved most of the time by performing appropriate debridement and antibiotic treatment at an early stage [6, 7]. A prolonged infection at the tibial bone tunnel might be associated with an extreme risk of infection spread to the joint. Hence, it is essential to perform a debridement, both intraarticularly and in the bone tunnel, sooner when a post-operative wound infection develops after ACL reconstruction [8].

This patient had a prolonged tibial tunnel infection after ACL reconstruction with a sinus at the surgical site. The clinical course

indicated that complete removal of artificial implants, the metal implant and the artificial ligament, and non-absorbable sutures, is required to prevent persistent infection after ACL reconstruction. From an intraoperative perspective, the leading cause of persistent infection might be the remaining artificial ligament and non-absorbable suture in the bone tunnel.

In this case, the infection wholly and immediately subsided with debridement only within the tibial bone tunnel and antibiotic treatment. According to previous reports, even when post-operative infection occurs after ACL reconstruction, the reconstructed ligament can be conserved. A cure is achieved most of the time by performing appropriate debridement and antibiotic treatment at an early stage.

Conclusion

For a chronic surgical site infection at the tibial tunnel after ACL reconstruction, it is essential to remove all implants, including artificial ligaments, as early as possible. Early detection and treatment with proper treatment protocol should be followed and preferably by the treating surgeon to reduce the risk of late-stage complications secondary to the infection. The use of bioabsorbable interference screw and non-absorbable poly filament suture for the fixation of graft potentially increases infection chances even if rare. Early detection and treatment with thorough debridement and antibiotics should be followed and preferably by the treating surgeon to reduce the risk of late-stage complications secondary to the infection.

Clinical Message

Surgical outcome of ACL reconstruction is rewarding many times but late infection and osteomyelitis though rare can seriously curtail the outcome. Regular long term follow up and promt address to any localized knee pain and swelling may help early diagnosis and treatment of such rare complication.

	Barry J [9]	Kevin S [2]	Hironori [8]	Chau CG [10]
Year	2013	2017	2017	2019
Publication	International Journal of Surgery Case Reports	Case Reports in Orthopedics	Fukushima J Med Sci	Malaysian Orthopedic Journal
Number of cases	1	1	1	1
Graft type	autologous hamstrings	autologous hamstrings	autologous hamstrings	Autologous hamstrings
Femoral fixation device	-	ToggleLoc	Endobutton	-
Tibial fixation	-	bioabsorbable interference screw	Interference screw and staple	-
Infected bone and tunnel	Tibia	Tibia	Tibia	Tibia
Etiology	Staph. capitis	Staph. epidermidis	Staph. aureus	-
Treatment	Debridement	Debridement + bone graft	Debridement	Debridement+ cement spacer and bone graft
Results	Healed	Healed	Healed	Healed

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Conflict of Interest: NIL
Source of Support: NIL

How to Cite this Article
Pokharel B, Kalawar RPS, Goyal AK | Chronic Tibial Tunnel Infection Following ACL Reconstruction: A Case Report and Review of The Literature | Trauma International | January-June 2021; 7(1): 19-21.