Original Article

Septic Arthritis after Arthroscopic Anterior Cruciate Ligament Reconstruction

SY Fong,[1] *MBBS, MRCS (Edin), M Med (Surg)*, JL Tan,[2] *FAMS, MBBS, FRCS (Edin & Glas)*

Abstract

Introduction: A retrospective review of postoperative infected anterior cruciate ligament (ACL) reconstruction was done on 472 consecutive cases in one institution. The purpose was to assess the incidence, diagnosis, treatment and outcome factors. Materials and Methods: Out of 472 arthroscopic-assisted ACL reconstructions performed between 1999 and 2002, 7 (1%) postoperative deep intra-articular infections were detected. Seven males with a mean age of 23 years (range, 19 to 30 years) formed the study group; 3 had undergone prior knee surgery. Results: Four patients had acute infection (<2 weeks), 3 had subacute infection (2 weeks to 2 months) and none had late infection (>2 months). All were admitted within 24 hours of onset of symptoms and underwent immediate arthroscopic lavage, incision and drainage of abscess, debridement with graft retention and intravenous (8 to 31 days) followed by oral (4 to 6 weeks) antibiotics. *Staphylococcus aureus* was present in 4 patients, *Peptostreptococcus* in 3, *Klebsiella* in 1, and *Enterobacter* in 1. The patients underwent an average of 1.4 arthroscopic procedures (range, 1 to 3 procedures), with an average hospital stay of 17.3 days per patient. All were evaluated at an average of 11.7 months (range, 5 to 26 months). In all cases, the infection resolved with stable knees and with all grafts and implants retained. Although rare, early diagnosis and prompt treatment of infection can result in successful eradication without sacrificing the graft.

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Introduction

Arthroscopic-guided reconstruction of the anterior cruciate ligament (ACL) is now recognised as the preferred reconstructive option in restoring anterior knee joint stability.[1] According to a report by the American Academy of Orthopedic Surgeons on ACL reconstruction in October 2000, approximately 50,000 ACL surgeries were performed each year in the United States (US). Like any surgical procedure, a number of potential complications have been recognised that may affect the functional outcome.[2-4] One of these, septic arthritis, is an uncommon but potentially catastrophic complication after ACL reconstruction surgery.[5-8] The clinical presentation, treatment and adverse consequences of septic arthritis had been previously described in 1966 by Argen et al.[9] Even though septic arthritis has been well documented after routine arthroscopic surgery of the knee, the incidence, treatment and prognosis of septic arthritis after ACL reconstruction in Asian patients are sparse and less clearly understood.[10-13] The purpose of this study was to retrospectively review our experience with septic arthritis after arthroscopic-guided ACL reconstruction in Asian patients and to report its outcomes.

Materials and Methods

Between 1999 and 2002, 472 arthroscopic-guided ACL reconstructions were performed. A retrospective review of these cases was done and a follow-up study was conducted for all patients who had postoperative septic arthritis. Seven patients developed septic arthritis, all in

[1] Registrar
Department of Orthopaedic Surgery
Tan Tock Seng Hospital
[2] Consultant and Head, Changi Sports Medicine Centre
Department of Orthopaedic Surgery
Changi General Hospital
Address for Reprints: Dr Fong Shee Yan, Department of Orthopaedic Surgery, Tan Tock Seng Hospital, 11 Jalan Tan Tock Seng Hospital, Singapore 308433.
Email: fongsy70@hotmail.com

the early (acute and subacute) postoperative period (1 to 8 weeks). All patients underwent immediate arthroscopic lavage, open incision, drainage of associated wounds and abscesses and debridement with graft retention; all were treated with intravenous antibiotics followed by oral antibiotics. At the final follow-up, the chart of each patient was retrospectively reviewed and all patients were recalled for a detailed evaluation. The chart review included evaluation of previous treatment to the affected knee, risk factors associated with the ACL reconstruction, clinical presentation and diagnostic information regarding the infection and subsequent treatment required to eradicate the infection and restore range of motion. Overall treatment outcome was determined at the final follow-up and included clinical interview and re-evaluation by an independent examiner at an average of 11.7 months (range, 5 to 26 months) after diagnosis of septic arthritis. Additional data to evaluate knee function were scored using the modified Lysholm and Gillquist knee scoring scale and the International Knee Documentation Committee (IKDC) form.[14-16] In addition, the Tegner activity score was assessed both before surgery and at the time of final follow-up examination.[15] Radiographic evaluation at the final follow-up consisted of standing anteroposterior view at zero-degree of extension, lateral, anteroposterior view weight-bearing at 45-degree flexion and axial Merchant patellar views.

Results

Seven (1 %) of 472 patients had postoperative septic arthritis of the knee after ACL reconstruction. All were male with a mean age of 23 years (range, 19 to 30 years) and no prior history of knee infections or diabetes. All had chronic ACL deficiency and 3 had prior surgery to the involved knee, but none had undergone an arthrotomy. Two of these patients mentioned had prior arthroscopic partial meniscectomy and the third had a previous arthroscopic meniscal repair. Three patients had undergone a concomitant medial meniscal repair using an all-inside technique and bioabsorbable meniscal fixation arrow (BioStinger, Linvatec, Largo, Florida, US) without any separate incision. All had a conventional quadrupled gracilis-semitendinosus hamstring tendon autograft primary reconstruction using standard knee arthroscopic portals (anteromedial and anterolateral), in addition to a 3- to 5-cm incision over the medial proximal tibia for hamstring harvest. Endobutton (Acufex, Mansfield, Massachusetts, US) was used for fixation at the femoral side of the tunnel, but different methods for the tibial tunnel fixation (Table 1). Incisions were made through the old arthroscopic portal wounds used in 3 of the patients who had prior arthroscopy. There was no intraoperative breach in sterile technique during any of the procedures. All patients had prophylactically received 1 g of intravenous cefazolin, a first-generation cephalosporin, before and after surgery. A tourniquet was inflated in every case for the entire duration of the procedure, from the graft harvesting to the tibial tunnel fixation. The operating/tourniquet time averaged 1.9 h (range, 1 to 3 h) for the 7 cases, which was not significantly different from that in knees that had not become infected. None of the 7 patients had a concomitant open secondary site procedure done at the time of ACL reconstruction; meniscal repairs were all-inside and arthroscopic-assisted. The duration of postoperative intra-articular drainage did not differ significantly between the infected group and non-infected group; surgical drains were all removed 24 to 48 hours after surgery. The average interval between ACL reconstruction and when the 7 patients returned to our institution with septic arthritis was approximately 3.5 weeks (range, 1 to 8 weeks). Four patients had acute infection (<2 weeks), 3 had subacute infection (2 weeks to 2 months) and none had late infection (>2 months). In all 7 patients, the diagnosis of infection was made within 24 hours of onset of symptoms. A day before the infection became apparent, none of them had an immediate postoperative course that was any different from patients who had undergone ACL reconstruction without subsequent infection. When they were examined at our clinic, all patients had variable degrees of localised erythematous swelling (abscess collection) of the tibial tunnel sites, low-grade fevers (between 37 and 39 degrees) and painful reduced knee motion associated with warm effusion. We aseptically aspirated 4 knees; the rest underwent arthroscopic drainage and washout on admission. All aspirations revealed turbid synovial fluid. The white blood cell count of the aspirated knee joint fluid had 90% to 95% polymorphonuclear cells. Additional laboratory studies revealed an average peripheral white blood cell count of 11.7 x 10^3 per uL (range, 10 to 16/uL; normal range, 4 to 10/uL), with 69% to 84% consisting of polymorphonuclear cells (normal range, 40% to 75%). Acute-phase reactants were all markedly elevated (except 1 patient), with an average erythrocyte sedimentation rate of 72 mm/h (range, 10 mm to 95 mm/h; normal range, <10 mm/h) and a C-reactive protein of 123 mg/L (range, 25 mg/L to 215 mg/L; normal range, <5 mg/L). Every patient underwent immediate arthroscopic irrigation and lavage, incision and drainage of all infected wounds and extensive arthroscopic debridement of necrotic and inflamed synovial tissues. The standard anteromedial and anterolateral arthroscopic portals through the old wounds were used, and all previous tibial incisions were opened. Deep intra-articular infections were discovered in all 7 patients, with positive bacterial growth in all the aspirates and/or arthroscopic specimen cultures. The following organisms were isolated in culture: *Staphylococcus aureus* (4 patients),

Table 1. Data on the 7 Patients Who Developed Septic Arthritis After Anterior Cruciate Reconstruction

Case	Age (y)	Sex	Prior knee surgery	Original ACL reconstruction	Duration of reconstruction (h)	Time to diagnosis of infection (wks)	Clinical data at time of diagnosis of infection	Culture/Therapy	No. of procedures after infection	Hospital stay (days)	Time to follow-up (mo)	Final range of motion (degrees)
1	25	Male	Arthroscopic partial meniscectomy 7 months ago	Primary (bioabsorbable screw tibial fixation) plus meniscal repair	3	8	WBC 13 Poly 69% ESR 10 CRP 25 Knee aspirate none	MSSA/ Enterobacter (cloxacillin, penicillin, gentamicin)	1	12	8	0-100
2	23	Male	None	Primary (spike tibial fixation) plus meniscal repair	2.5	1	WBC 16 Poly 74% ESR 95 CRP 138 Knee aspirate turbid WBC 95%	Klebsiella/PS (cloxacillin, penicillin, gentamicin)	1	14	5	0-110
3	23	Male	None	Primary (metallic screw tibial fixation) plus meniscal repair	2	2	WBC 10 Poly 74% ESR 95 CRP 179 Knee aspirate turbid WBC 95%	PS (cloxacillin, metronidazole)	1	10	12	0-130
4	19	Male	Arthroscopic medial meniscal repair 10 months ago	Primary (bioabsorbable screw tibial fixation)	1.5	6	WBC 10 Poly 69% ESR 81 CRP 55 Knee aspirate none	MSSA (cloxacillin, penicillin, gentamicin)	1	8	7	0-90
5	23	Male	None	Primary (spike tibial fixation)	1.5	2	WBC 11 Poly 84% ESR 86 CRP 93 Knee aspirate turbid WBC 90%	PS (cloxacillin, metronidazole)	1	21	19	0-130
6	19	Male	Arthroscopic partial meniscectomy 3 months ago	Primary (staple tibial fixation)	1.5	1	WBC 11 Poly 74% ESR 44 CRP 215 Knee aspirate none	MRSA (vancomycin, fusidic acid)	2	31	5	0-90
7	30	Male	None	Primary (staple tibial fixation)	1	5	WBC 11 Poly 70% ESR 94 CRP 157 Knee aspirate turbid WBC 90%	MSSA (cloxacillin, penicillin, gentamicin)	3	25	26	0-120

ACL: anterior cruciate ligament; CRP: C-reactive protein (mg/L); ESR: erythrocyte sedimentation rate (mm/h); MRSA: methicillin-resistant *Staphylococcus aureus*; MSSA: methicillin-sensitive *Staphylococcus aureus*; PS: *Peptostreptococcus,*; Poly: polymorphonuclear cells; WBC: total white cell count per uL

Peptostreptococcus (3 patients), *Klebsiella* (1 patient) and *Enterobacter* (1 patient). In all cases, the autogenous ACL graft appeared intact on arthroscopy with only a thin fibrinous exudate on its surface, which was debrided. The grafts, with their original femoral and tibial fixation hardware, were retained in all cases. Intra-articular drain was left in place for 2 to 5 days after surgery.

An average of 1.4 arthroscopic procedures (range, 1 to 3 procedures) were performed during hospital stay. Additional lavage and debridement were deemed necessary in 2 patients because of persistent wound drainage or fever. In addition, examination under anaesthesia revealed a normal Lachmann test with a firm end point and negative pivot shift examination in 5 patients, with patients 1 and 2 having a positive pivot glide. The average inpatient hospital stay was 17.3 days (range, 8 to 31 days). All patients were immediately started on intravenous antibiotics after initial aspiration or arthroscopy. An infectious disease consultation was obtained in each case; the choice and duration of both intravenous and oral antibiotics were recommended by the infectious disease consultant after confirmation of antibiotic sensitivities. These patients remained on intravenous antibiotics for an average of 17.3 days (range, 8 to 31 days), followed by oral antibiotics for an average of 4 weeks (range, 4 to 6 weeks). After the infection had been controlled, postoperative physical therapy consisted of passive and active assisted knee range of motion exercises with crutch assistance, but none used a brace. All infections were successfully eradicated with arthroscopic lavage and debridement with graft retention, as well as with intravenous and oral antibiotics; erythrocyte sedimentation rate and C-reactive protein decreased to within normal range after 3 months of antibiotic therapy in all cases. Hardware devices, which were used to fix the grafts, were all retained, including all tibial implants.

A comprehensive physical examination and clinical evaluation were performed at an average follow-up of 11.7 months (range, 5 to 26 months). All patients stated that they had no problems with work or other daily activities. Physical examination at the final follow-up revealed that all incisions had healed with no signs of infection (such as pain and erythema). All patients had nearly full range of motion with no extension lag and lacked an average of 20 degrees of flexion (range, 0 degree to 40 degrees) compared to the opposite uninvolved knee. Follow-up evaluation also demonstrated that all patients had a negative manual Lachmann examination with a firm end point. The pivot shift test was negative in 5 patients and positive (pivot glide) in patients 1 and 2, though none had experienced any clinical instability. The IKDC score is based on 4 problem areas (patient subjective assessment, symptoms, range of motion and ligament examination), and 1 of 4 grades (normal, nearly normal, abnormal and severely abnormal) was scored for each problem area. The overall IKDC grade was based on the lowest grade within a group that determines the group grade, and the worst group grade determines the final evaluation.[16] Two patients had a final evaluation of abnormal (both had normal pre-injury evaluations); their injured knee performances were rated 80% and 85% of the uninjured side, respectively. Activity levels before injury and at the final follow-up were rated by the Tegner activity score.[15] Levels 0 to 3 correspond to daily activities, levels 4 to 6 correspond to physical fitness sports and individual competitive sports, and levels 7 to 10 correspond to competitive contact sports. The mean pre-injury score was 7 (range, 5 to 9). The mean score at the final follow-up was 5.14 (range, 4 to 6), indicating an average decrement of 2 levels compared to the pre-injury score. At the final follow-up evaluation, all 7 patients had varying degrees of quadriceps muscle weakness and wasting compared with the uninjured contralateral leg. Plain radiographs were assessed for all patients at the final follow-up and compared with preoperative radiographs. There was no evidence of osteomyelitis (erosion, sclerosis and implant loosening) or degeneration (osteophyte formation and joint space narrowing). The most tangible measure of cost, in terms of morbidity and economic loss, is the number of hospital days required to treat these infections; these totalled 121 days collectively, with an average hospital stay of 17.3 days (range, 8 to 31 days) per patient.

Discussion

Infections after arthroscopic surgeries are infrequent. In 1985, a nationwide survey of orthopaedic surgeons showed an infection rate of 0.08%, out of a total of 118,590 arthroscopies.[11] The incidence of septic arthritis after knee arthroscopy had previously been reported to be between 0.15% and 0.42%.[12,13,17] In 1998, a survey of 61 directors of Sports Medicine Fellowship programmes showed that 30% had treated an ACL infection in the past 2 years and 43% had treated an infection in the last 5 years. There was no significant difference in the number of infections and the surgeons' caseload, graft choice or method of reconstruction.[18] The first case of pyoarthrosis after arthroscopic assisted ACL reconstruction was reported by Kohn in 1998.[5] Since then, 3 large retrospective reviews of septic arthritis after ACL reconstruction had reported an infection rate of 0.3%, 0.14% and 0.48% respectively.[6-8] In our series, the incidence of postoperative septic arthritis after ACL reconstruction was 1%. In a retrospective study, Williams et al[6] reported 7 (0.3%) deep infections after a review of 2500 ACL reconstructions performed between 1988 and 1993 using bone-patellar tendon-bone autograft. They isolated *Staphylococcus aureus* in 6 patients and *Peptostreptococcus* in 1 patient. They also removed the

ACL grafts in 4 patients; 3 of them had a concomitant open procedure at the time of ACL reconstruction. Four patients had 2 or more procedures after their initial arthroscopic debridement. The worst outcome was osteomyelitis in a 17-year-old patient. McAllister et al[7] reported 4 (0.48%) cases of septic arthritis in 831 consecutive patients between 1987 and 1998. *Staphylococcus aureus* was isolated in all patients. The average interval between ACL reconstruction and the appearance of septic arthritis in the 4 patients was 11 days (range, 8 to 18 days). In all 4 patients, the diagnosis of infection was made within 24 hours of the onset of symptoms. An average of 2.75 procedures (range, 2 to 4 procedures) were performed to eradicate the infection, but all the grafts were retained. Indelli et al[8] had 5 (0.14%) cases of septic arthritis after ACL reconstructions between 1992 and 1998 using bone-patellar tendon-bone autograft (40%) and allograft (60%). Again, *Staphylococcus aureus* was the most commonly encountered pathogen (3 patients), *Staphylococcus epidermidis* was the causative organism in 2 patients and *Peptostreptococcus* was isolated in 1 patient. Diagnosis was made at an average interval of 7.5 days (range, 2 to 20 days) from the onset of symptoms. More than 1 arthroscopic procedure was performed in all the patients and the ACL graft was removed in 2 patients. The worst outcome was a 51-year-old man who had a total knee replacement. In our study, the clinical symptoms were similar for each patient and the signs and symptoms were similar to those previously described for septic joints.[6-9] The classic clinical syndrome of septic arthritis – including swelling, rapidly progressive knee pain, local erythema, wound drainage and local warmth accompanied by a fever – was present, to some extent, in all our patients.[9] All patients came to our hospital within 24 hours after developing clinical symptoms. The peripheral white blood count was abnormally elevated in 4 patients, markedly in 1. The erythrocyte sedimentation rate and C-reactive protein level were also markedly elevated in all patients but 1. Blood cultures, although helpful, yielded a positive result in only 1 patient. Gross synovial fluid appearance, white cell counts and gram stains were more reliable guides to the early and correct diagnosis of infection in every case that had a knee aspiration. The gross appearance of the synovial fluid was consistently turbid; all gram stains were positive with over 90% white cells. Synovial fluid and tissue cultures isolated the specific pathogen in every case, usually 2 to 3 days later. The microbiological confirmation allowed fine-tuning of specific antibiotic treatment by the infectious disease physician in all of our cases.

The goals of treatment for septic arthritis after ACL reconstruction are, first, to protect the articular cartilage and, second, to protect the graft.[8] Prompt and specific antibiotic therapy is the most vital requisite treatment. An animal study which measured the extent to which early antibiotic therapy prevented degradation of the articular cartilage after knee infection from *Staphylococcus aureus*, showed that the cartilage would have lost more than half of its glycosaminoglycan and collagen if treatment had not begun within 7 days from the onset of infection.[19] Similar to the series of McAllister et al,[7] the 7 patients in our study commenced antibiotic therapy within 24 hours of the diagnosis of septic arthritis; none of them required graft or hardware removal. This was borne out by a Swedish study which demonstrated increased loss of mobility when antibiotic treatment was delayed for more than 5 days.[20] Besides antibiotic therapy, septic arthritis in any joint also requires prompt decompression to minimise the severity of the sequelae, including degenerative arthritis and osteomyelitis.[7] There is a lack of consensus in the orthopaedic literature concerning the specific treatment for septic arthritis of the knee and many treatments had been previously described. Recommendations for surgical technique, use of lavage tubes (suction-irrigation devices) and duration of antibiotic therapy varied widely. In general, several recently published reviews on the management of septic arthritis of the knee joint seemed to agree on the efficacy of arthroscopic lavage (using normal saline) and arthroscopic debridement, and its superiority to open arthrotomy, with significantly less morbidity.[21-24] Arthroscopy allows easy access to the joint, decompression of the joint, adequate debridement, shorter postoperative recovery times, and copious lavage under pressure. Loculations and fibrous adhesions can be broken down by the lavage fluid, which should reduce the risk of post-infection arthrofibrosis. In the study by Studahl et al,[20] 64 patients with septic arthritis of the knee 2 to 11 years after the acute disease demonstrated 79% excellent or good long-term results following this treatment. In fact, 85% of surgeons in a nationwide survey selected culture-specific intravenous antibiotics and surgical irrigation of the joint with graft retention as the initial treatment for infected patellar tendon autograft; 64% chose this regimen to treat the infected allograft. For infection that does not respond to the initial treatment, intravenous antibiotics with surgical irrigation and graft retention was the most common treatment combination in 39% of respondents.[18] Of the 4 autogenous ACL grafts that were removed in Williams' study of 7 patients, it is interesting to note that the histologic analysis of these "infected" grafts revealed no inflammatory infiltrate, despite gross evidence of devitalised or inflamed tissue at the time of arthroscopic lavage.[6] Careful inspection of the ACL graft and gentle debridement, if necessary, with retention of the graft and fixation hardware could be considered only if the graft fixation was stable.[7] Graft excision and hardware removal are considered only for infection that is resistant to initial treatment and for the infected allograft.[18] In our series, all grafts were

successfully retained and repeat surgeries were only necessary in 2 patients to fully eradicate the infection and improved knee motion.

Armstrong et al[12] identified a higher risk of sepsis after routine arthroscopy in their patients who had undergone a prior procedure in the same joint. They also showed, in another study, that previous use of intraoperative intra-articular corticosteroids correlated with the occurrence of infection.[25] It is interesting to note that 75% of the patients in McAllister's series[7] had undergone a prior surgical procedure to their operative knee and 2 of these had entailed a formal arthrotomy. Three out of 7 of our patients (43%) had also undergone previous arthroscopy on the same knee 3, 7 and 10 months respectively, prior to ACL reconstruction. Three also had simultaneous meniscal repairs at the time of ACL reconstruction, necessitating the use of intra-articular implant material (meniscal arrows), which could have acted as a foreign body. None, however, required additional incision as an all-inside technique was used for the meniscal repair. In contrast, the series by McAllister et al[7] had 2 patients (50%) with infection who had undergone ACL reconstruction together with concomitant medial meniscal repair, but using an inside-out technique with a separate posteromedial incision. Williams et al[6] reported 4 cases (57%) who had undergone concurrent meniscal repairs using an outside-in technique, again with additional incisions. They also noted that the second procedure increased their operative time. However, in the study by Indelli et al,[8] none of the patients with infected ACL reconstructions had meniscal repair in the same setting. Furthermore, Austin and Sherman[26] reported only 1 case of deep infection in 101 patients who underwent arthroscopic meniscal repair. We were unable to document increased operative/tourniquet time and increased environmental contamination (excessive personnel traffic, dust or incomplete sterilisation of instrument) as contributors to postsurgical infection in our patients. This was unlike a recent study in Italy, which discovered contamination in the supposedly sterile inflow cannula after an unusual epidemic of coagulase-negative Staphylococcal infections involving ACL reconstruction.[27] Another report in the US described 4 patients who acquired post-surgical septic arthritis due to contaminated bone-tendon-bone allografts used in ACL reconstruction.[28] Otherwise, there was no statistical difference in postoperative infection rates between uncomplicated allograft and autologous bone-patellar tendon-bone graft.[8]

All patients received appropriate perioperative intravenous antibiotic prophylaxis. While the efficacy of prophylactic antibiotics for arthroscopic procedure (a relatively "minimally-invasive" procedure) is not known, in a rabbit model reported by Schurman et al,[29] antibiotics administered 1 hour before surgery successfully protected the joint from a low-dose bacterial challenge. We postulated that in all our patients their infection had spread from the tibial tunnel end (extra-articular) to the knee joint (intra-articular). This is because all their tibial sites were infected, irrespective of the types of tibial fixation implant used (4 tibial spikes and 3 cannulated interference screws). The infection could have originated from haematoma collection in the pretibial subcutaneous tissue. The relatively superficial site of infection might have allowed early detection and diagnosis in our patients. McAllister et al[7] had suggested the use of non-cannulated interference screws because they believed that the cannulated screws were a potential conduit for infection spread between the intra- and extra-articular environments. A recent paper by Bohy et al[30] even suggested sealing the lumen of the cannulated interference screw with bone wax to prevent the screw from behaving as a new "drain", leading to blood leakage from inside the knee joint, after the intra-articular surgical drain was removed. The duration of postoperative intra-articular drainage did not differ significantly between the infected group and the non-infected group.

Although the most common infectious agent is still *Staphylococcus aureus*, the high occurrence of Pepto-streptococcal septic arthritis in 3 (43%) out of 7 patients was unexpectedly high. Peptostreptococcal septic arthritis after ACL reconstruction had been reported by Williams et al and Felten et al.[6,31] *Peptostreptococcus* is an anaerobic gram-positive cocci which has been described in children with septic arthritis and osteomyelitis. The infection is mostly secondary to hematogenous spread, though this is rare and is not always related to polymicrobial infection, oral infection or implant materials as commonly reported.[32] None of the patients in our study had orofacial odontogenic infection or diabetes. Despite the wide sensitivity to commonly-used antibiotics, all infections in previously mentioned reports were only eradicated after a prolonged course of various antibiotics used in combination, adequate drainage of purulent material and removal of foreign material.[31,32] In their survey of 64 patients 2 to 11 years after septic arthritis of the knee, Studahl et al[20] found that the pain scores of the joint had increased by 21% and 16% respectively, compared to the scores for the opposite normal joints. The anatomical and mobility scores were reduced by 9% and 8%, respectively. An age of less than 45 years was associated with a greater score loss than in older patients, a common age range for ACL reconstruction. Although our patients also scored lower on the Lysholm and Gillquist, the IKDC and Tegner scores, compared to pre-injury status, had similar clinical outcome with regards to knee stability and function when compared to ACL reconstruction with no infection. However, our follow-up is short and

eventual graft failure (perhaps structurally weakened by the infection) and even post-infection articular cartilage degeneration may cause the knees to become symptomatic. The morbidity from knee sepsis after ACL reconstruction is profound from both financial and functional perspective. According to McAllister et al,[7] this complication resulted in hospital costs being 6 times more than that of an uncomplicated ACL reconstruction. These figures did not include outpatient costs or indirect financial losses, such as lost wages and time away from work. Although postoperative septic arthritis is rare after arthroscopic-guided ACL reconstruction, it carries a high morbidity that results in protracted hospitalisation and, ultimately, a less favourable clinical outcome. It is important to recognise this problem early as we had found in our series that the infection can be successfully eradicated, with stability of the knee maintained, near full range of motion achieved, and ACL grafts retained, only with early diagnosis and prompt treatment.

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