



University of Nebraska
Medical Center
Nebraska Medicine

Graduate Medical Education
Research Journal

Volume 6 | Issue 1

Article 77

June 2024

Ballistic Periprosthetic Fracture: An Unusual Indication for Revision Total Knee Arthroplasty

Timothy Lackner

University of Nebraska Medical Center

Tell us how you used this information in this [short survey](#).

Follow this and additional works at: <https://digitalcommons.unmc.edu/gmerj>



Part of the [Higher Education Commons](#), and the [Medicine and Health Sciences Commons](#)

Recommended Citation

Lackner, T. Ballistic Periprosthetic Fracture: An Unusual Indication for Revision Total Knee Arthroplasty. Graduate Medical Education Research Journal. 2024 Jun 28; 6(1).
<https://digitalcommons.unmc.edu/gmerj/vol6/iss1/77>

This Conference Proceeding is brought to you for free and open access by DigitalCommons@UNMC. It has been accepted for inclusion in Graduate Medical Education Research Journal by an authorized editor of DigitalCommons@UNMC. For more information, please contact digitalcommons@unmc.edu.

Ballistic Periprosthetic Fracture: An Unusual Indication for Revision Total Knee Arthroplasty

Abstract

NA

Creative Commons License



This work is licensed under a [Creative Commons Attribution-Noncommercial-No Derivative Works 4.0 License](https://creativecommons.org/licenses/by-nc-nd/4.0/).

Conclusion: CG is a rare disorder characterized by abnormal glomerular deposition of type III collagen. Its cause and pathogenesis are unclear and lack definitive treatment.

There is a paucity of cases describing recurrence post-transplant and its implication on long term graft outcomes is unknown. Here, we describe a case of late recurrent CG,

presenting with sub-nephrotic proteinuria and stable allograft function.

#78. Schisto-What? A Classic Case of Nephrotic Syndrome With an Unclassic Pathogen

Kyle J. Scholten¹, Akshay Kashyap², Kevin Brittan¹, Brandon Miller¹

¹Department of Internal Medicine, College of Medicine, University of Nebraska Medical Center, Omaha, NE, USA

²College of Medicine, University of Nebraska Medical Center, Omaha, NE, USA

Mentor: Brandon Miller

Program: Internal Medicine

Type: Case Report

Background: Schistosomiasis is a common disease in the developing world that affects over 200 million people, with the highest prevalence in sub-Saharan Africa. It is uncommon in the United States (US), as the parasite is not endemic to the area. We present a classic case of nephrotic syndrome with an unlikely culprit.

Case: A 50-year-old Somali woman with a history of congestive heart failure, type 2 diabetes, and recently diagnosed

schizophrenia presented with dyspnea, orthopnea, peripheral edema, and lower extremity pain that began three days prior. Chest x-ray highlighted large bilateral pleural effusions. Vitals were pertinent for a blood pressure of 208/76 mmHg and oxygen saturation of 83%. Creatinine was 1.41, glucose was 240, high sensitivity troponin was 23, congestive heart failure peptide was 2330, and albumin/creatinine ratio was 3895. CT chest showed splenic infarction.

Workup for the cause of nephrotic range proteinuria was negative. Transthoracic echocardiography showed a pulmonary arterial systolic pressure of 75 mmHg. Schistosomiasis IgG resulted positive.

Hospital stay was complicated by increasing paranoia of the patient. A renal biopsy, lumbar puncture, and brain MRI – due to concern for neuroschistosomiasis given psychiatric symptoms - were recommended by infectious disease. Given complicated psychosocial factors, the testing was not performed. Ultimately, infectious disease recommended the patient be treated with prednisone 80 mg daily for one week, followed by praziquantel 40 mg/kg orally for three days with steroid taper for one month empirically.

Conclusion: Although uncommon in the US, schistosomiasis should be considered in patients with a travel or immigration history from endemic areas with nephrotic syndrome.

#79. Cost-Effectiveness Modeling of the Use of Chlorhexidine Gluconate Irrigation Solution to Prevent Postoperative Infection in Inflatable Penile Prosthesis

Sean McDermott¹, Matthew Schefcik¹, Alan Quach¹, Christopher Deibert¹

Department of Surgery, Division of Urology, College of Medicine, University of Nebraska Medical Center, Omaha, NE, USA

Mentor: Christopher Deibert

Program: Urologic Surgery

Type: Original Research

Background: Inflatable penile prosthesis (IPP) is an excellent surgical option for men with refractory erectile dysfunction. Though uncommon, the potential for infection remains and can lead to surgical revision or explant. To prevent this, intra-operative irrigants to flush each corpus cavernosum are employed. However, even with these products, IPP placement poses a 0.5%-3% infection risk. One such irrigant, Irrisept, (chlorhexadine gluconate CHG) has recently been introduced into the field of urology for IPP surgery. This investigation aimed to define the range of IPP infection rates at which Irrisept CHG could serve as a cost-effective approach.

Methods: By utilizing the Markov Model (constructed using TreeAgePro 2022) using established data from literature to define the incremental cost of complications following IPP placement, we aim to use this to identify the range of infection rates at which CHG could serve as a cost-effective alternative. The probability of infection using Irrisept CHG

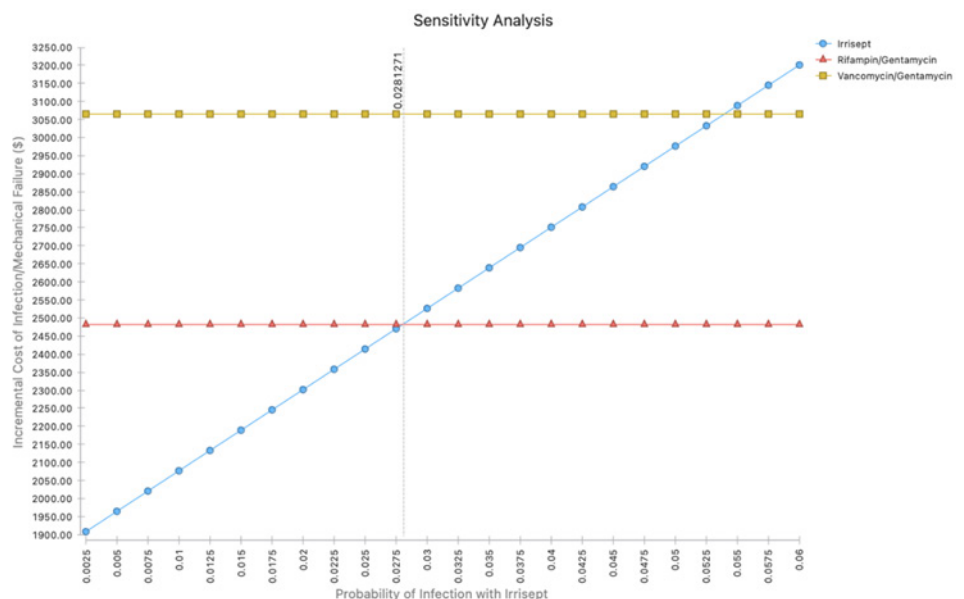


Figure 1. Sensitivity analysis of incremental cost of unsuccessful surgery when using CHG compared to Rifampin/Gentamicin and Vancomycin/Gentamicin.

was investigated during sensitivity analysis at a range of 0.25% to 6%.

Results: In our model, we found the incremental cost of infection/mechanical failure

to be several thousand dollars when utilizing standard antibiotic regimens of Rifampin/Gentamicin (\$2483) and Vancomycin/Gentamicin (\$3066). However, if CHG irrigation (\$65/operation) is utilized instead,

cost savings of several hundred to up to over a thousand dollars are observed, so long as CHG maintains below a 2.8% infection rate (**Figure 1**).

Conclusion: The lower baseline cost and potential for equivalent or superior infection prevention with Irrisept CHG make it an intriguing option for use in IPP surgeries.

#80. Suprachoroidal Triamcinolone for the Treatment of Refractory Macular Edema Secondary to Non-infectious Uveitis

Bryant Menke¹, **Marc Ohlhausen¹**, Steven Yeh¹

¹Department of Ophthalmology & Visual Sciences, College of Medicine, University of Nebraska Medical Center, Omaha, NE, USA

Mentor: Steven Yeh

Program: Ophthalmology

Type: Original Research

Background: Uveitis is a potentially blinding spectrum of inflammatory conditions affecting different structures of the uvea, including the iris, ciliary body, and choroid. Vision loss in uveitic patients is most commonly attributed to macular edema. Starting in the 1950s, systemic corticosteroids have been the primary treatment for uveitic macular edema. However, due to concern for adverse effects, localized corticosteroid technologies were developed. Although these delivery modalities limited the systemic adverse effects, they are known to increase the risk for cataracts and ocular hypertension. Suprachoroidal injection of triamcinolone gained approval from the Food and Drug Administration in 2021 as a novel technology to limit the risks associated with other localized delivery methods.

Methods: We performed a retrospective review of patients who received treatment at a tertiary referral academic institution with suprachoroidal triamcinolone for non-infectious uveitic macular edema. Our cohort included six eyes of five affected patients.

Results: The mean initial best corrected visual acuity of the eyes treated was 41.1 ETDRS letters (Range -30.1 – 69.9). There was a significant improvement in visual acuity at 1- and 2-months with a maximum improvement of 11.4 ETDRS letters at 3 months following injection (**Figure 1**). The mean initial central subfield thickness from ocular coherence tomography was 646 microns (Range 311 – 983). There was significant

improvement at 2-, 3-, and 6-months following injection with maximum improvement of 460.3 microns at 1 month following injection, that persisted for another month.

Conclusion: Our study cohort supports the efficacy and safety of suprachoroidal triamcinolone for treating severe, refractory macular edema associated with non-infectious uveitis.

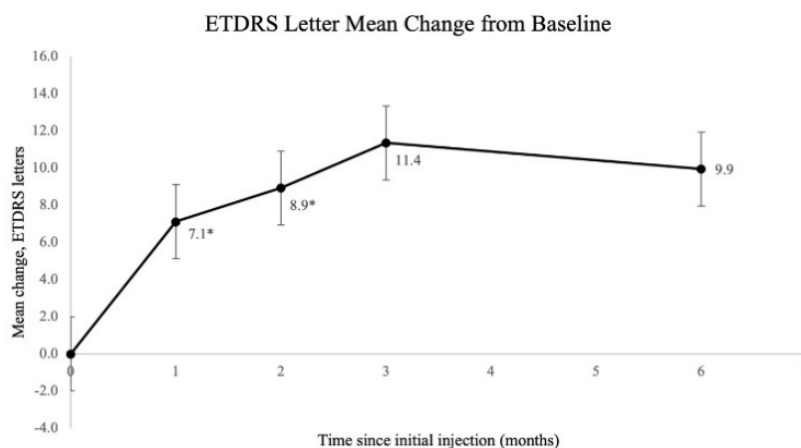


Figure 1. Mean change in ETDRS letters versus time since initial injection. The error bars represent the standard error.

#81. Changes in Anterior Tibial Translation Are Not Associated With Degradation in Weightbearing Cartilage of the Knee Following Anterior Cruciate Ligament Reconstruction

Tyler Kallman¹, Mark Amirharaj¹, Melissa Manzer², Matthew Tao¹, Elizabeth Wellsandt³

¹Department of Orthopaedic Surgery & Rehabilitation, College of Medicine, University of Nebraska Medical Center, Omaha, NE, USA

²Department of Radiology, College of Medicine, University of Nebraska Medical Center, Omaha, NE, USA

³Department of Physical Therapy, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE, USA

Mentors: Matthew Tao, Elizabeth Wellsandt

Program: Orthopaedic Surgery

Type: Original Research

Background: Anterior cruciate ligament (ACL) injury is a frequent knee injury that commonly results in post-traumatic osteoarthritis (PTOA). ACL reconstruction (ACLR) cannot restore pathologic anterior tibial translation (ATT) following ACL injury and increased static ATT on magnetic resonance imaging (MRI) is associated with rotary

instability of the knee. However, how ATT relates to the development of PTOA, has not been well studied. The primary aims of this study were to compare cartilage breakdown (longer T2 relaxation times) after ACLR and investigate whether greater ATT is associated with cartilage breakdown.

Methods: Twenty-nine participants were enrolled within one month of ACL injury. T2 relaxation maps were generated with MRI data for bilateral knees pre-operatively and 6 months following ACLR. Articular cartilage segmentation and ATT measurements were

completed using sagittal MRI. Paired t tests were used to compare T2 relaxation times, and Pearson correlations were used to determine the relationship between changes in ATT and differences in T2 relaxation time.

Results: T2 relaxation times increased in all weightbearing regions of interest after ACLR except the posterior weightbearing region in the lateral femoral condyle and the central weightbearing region in the lateral tibial condyle. Neither the post-operative change in ATT nor the difference in ATT between injured and uninjured limbs before ACLR

were significantly correlated with increase in T2 values.

Conclusion: Cartilage degradation after ACLR is evident as early as 6 months

post-operatively. However, greater ATT 6 months after ACLR was not correlated with articular cartilage degradation in the femur or tibia.

#82. Collaboration Between Orthopaedic Surgery and Psychiatry Residency Programs to Improve Education About Orthopaedic Pain Management for Patients With Mental Illness

Keagan Gertz¹, Brooke Gertz², Jyotsna Ranga², Scott Vincent¹

¹Department of Orthopaedic Surgery & Rehabilitation, College of Medicine, University of Nebraska Medical Center, Omaha, NE, USA

²Department of Psychiatry, College of Medicine, Creighton University, Omaha, NE, USA

Mentor: Scott Vincent

Program: Orthopaedic Surgery

Type: Original Research

Background: The pharmacologic interaction between opioids and antidepressants has been a recent topic of interest since it affects the quality of pain control experienced by patients with mental illness. It would thus benefit orthopaedic surgery residents to have a basic understanding of these pharmacologic interactions and their impact. The purpose of this study was to identify gaps in knowledge among orthopaedic surgery residents

regarding this topic, and whether a brief intervention in the form of a lecture could fill that gap.

Methods: A 10-question survey was sent to the orthopaedic surgery residents at a single institution. Three days later, a 15-minute lecture regarding the pharmacology of opioids and antidepressants was given by a psychiatry fellow to the orthopaedic surgery residents. Three days after the lecture, another survey was given to the residents assessing their comfort level with the covered topics using a 5 tier Likert scale from “strongly disagree” to “strongly agree.” The perceived usefulness of the lecture and change from pre and post

intervention responses were recorded and analyzed.

Results: All questions assessing the comfort level and perceived knowledge level of the residents on the topics covered saw a significant increase in mean Likert ratings from pre to post intervention.

Conclusion: This study identified knowledge of opioid medication interactions as a potential educational gap in orthopedic surgery residency. Brief interventions such as a collaborative short lecture may help bring a baseline level of knowledge about this subject to the orthopaedic resident.

#83. Obstetrics and Gynecology Subspecialty Faculty: A Workforce Analysis

Morgan Steffen¹, Heng Jiang², Shilpa Tummala³, Taoyuan M. Beninato², Alexandra Pool², Emma Poulas², Mary Kinyoun¹, Tyler Muffy⁴

¹Department of Obstetrics & Gynecology, College of Medicine, University of Nebraska Medical Center, Omaha, NE, USA

²College of Medicine, University of Nebraska Medical Center, Omaha, NE, USA

³School of Medicine, University of Colorado, Aurora, CO, USA

⁴Department of Obstetrics & Gynecology, Denver Health and Hospital Authority, Denver, CO, USA

Mentor: Mary Kinyoun

Program: Obstetrics & Gynecology

Type: Original Research

Background: The Accreditation Council for Graduate Medical Education requires a qualified subspecialist in each Obstetrics and Gynecology (OBGYN) subspecialty. The objective of this study was to quantify the national subspecialist workforce involved in the clinical education of OBGYN residents and to provide an overview of the subspecialist faculty workforce’s geographic distribution and demographics.

Methods: This was a cross-sectional, observational study. A list of OBGYN residency programs, their sponsoring institutions/locations, and affiliated locations was compiled. Faculty subspecialists’ names were collected by manually searching each program’s website. Demographics were collected from publicly available data. Subspecialty faculty who had completed an OBGYN residency, were fellowship trained, and/or had board

certification in the subspecialty were included in the study.

Results: A total of 4,659 subspecialist faculty were identified from 278 residency programs, representing 81.5% of the total subspecialist workforce in OBGYN (n=5,716). Of the subspecialists identified, 2,838 were faculty at sponsoring institutions, representing 49.7% of the entire subspecialist workforce; the remainder worked with residents at affiliate locations. Our results showed 59.9% of subspecialists were female and 40.1% were male; 97.0% were allopathic. Subspecialists were present in 45 states, with the exception of Alaska, Idaho, Montana, North Dakota, South Dakota, and Wyoming. **Figure 1** demonstrates the geographic

distribution and density of faculty subspecialists.

Conclusion: Most of the OBGYN subspecialty workforce is involved in the clinical education of OBGYN residents, with half of the workforce on faculty at the residency program sponsor site. The subspecialty faculty workforce is primarily female, has an allopathic degree, is mid-career, and is geographically diverse.

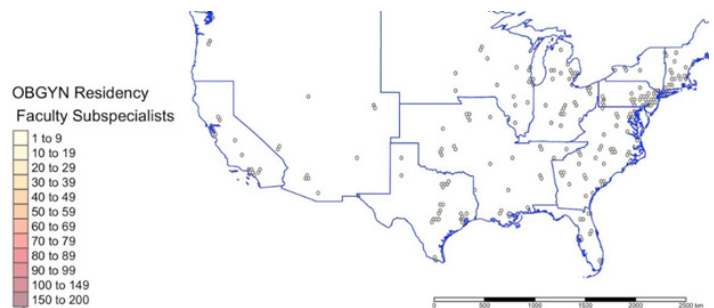


Figure 1. Distribution of Obstetrics and Gynecology subspecialty faculty affiliated with residency programs across the continental United States. Map dividing lines represent the borders of American College of Obstetricians and Gynecologists district borders.

#84. Ballistic Periprosthetic Fracture: An Unusual Indication for Revision Total Knee Arthroplasty

Timothy Lackner¹, Beau Kildow¹

¹Department of Orthopaedic Surgery & Rehabilitation, College of Medicine, University of Nebraska Medical Center, Omaha, NE, USA

Mentor: Beau Kildow

Program: Orthopaedic Surgery

Type: Case Report

Background: The most common indications for revision total knee arthroplasty (TKA) are aseptic loosening, prosthetic joint infection, and instability. However, less common indications do exist and can be difficult to manage.

Case: This case involves a 78-year-old male that presented to the emergency department after sustaining an accidental gunshot wound to the knee while cleaning his firearm. X-rays showed a comminuted periprosthetic femur fracture around a prior TKA with evidence of implant loosening (**Figure 1a**). The decision was made to proceed with a single-stage revision. Intraoperatively, the existing components were grossly loose and removed with minimal bone loss. The fracture of the medial femoral condyle was stabilized using a cerclage cable. A medial distal femoral augment was needed to restore the joint line given the comminution. The anterior portion of the deep medial collateral ligament was found to be disrupted. However, the posterior portion remained intact, so varus-valgus constrained implants were not needed. Metaphyseal cones and intramedullary stems were used in both the tibia and femur to improve fixation (**Figure 1b**). The knee was then examined and felt to be balanced and stable through its range of motion. The soft tissue envelope was closed without tension at the conclusion of the

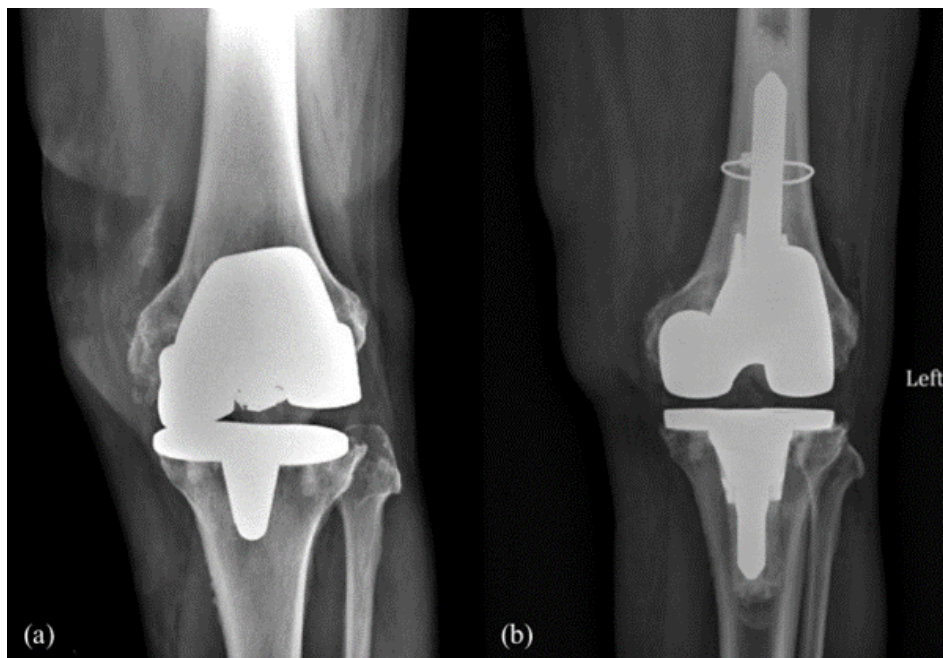


Figure 1. (a) Initial x-rays taken at the time of injury demonstrating a ballistic fragment lodged in the intercondylar notch of the femoral component of the existing total knee arthroplasty with an associated periprosthetic fracture of the medial femoral condyle and obvious loosening of the femoral component; and (b) immediate postoperative x-rays demonstrating revision total knee arthroplasty with cemented stemmed components and metaphyseal cones in both the tibia and femur in addition to a cerclage cable at the level of the distal femoral metaphyseal flare.

procedure.

Conclusion: A thorough understanding of revision arthroplasty is essential in providing good patient outcomes, especially in challenging revision situations. Basic principles

include achieving stable component fixation, managing bone loss, restoring the joint line, and ensuring adequate soft tissue coverage. Adhering to these principles will allow a surgeon to manage many difficult revision scenarios.

#85. Not All Anemias in Training Room Need Iron Replacement

Spencer Cooper¹, Jason Meredith¹

¹Department of Family Medicine, College of Medicine, University of Nebraska Medical Center, Omaha, NE, USA

Mentor: Jason Meredith

Program: Family Medicine

Type: Case Report

Background: Assessing hemoglobin and ferritin levels is a common part of college preparticipation exams due to the effect of anemia on athletic performance. Microcytic anemia in athletes is often caused by iron deficiency but beta-thalassemia can present similarly. Approximately 80-90 million individuals are carriers worldwide. Studies have shown that beta-thalassemia minor can decrease anaerobic conditioning with little effect on aerobic conditioning.

Case: A 23-year-old male baseball player presented to the training room inquiring about iron supplementation after lab work obtained during a preparticipation physical showed microcytic anemia. No personal or family history of anemia; previous negative Sickledex. The patient denied any fatigue or shortness of breath during workouts over the summer. Diet was well balanced, consisting of green leafy vegetables and ample amounts of protein. Normal physical exam with no concerning signs noted. Workup displayed continued microcytic anemia with normal iron studies. Additional studies, including hemoglobin electrophoresis, revealed Hemoglobin A2 Quant 5.2% (elevated) and Hemoglobin F quant less than 1% (normal); findings were consistent with beta-thalassemia minor.

The patient received counseling on diagnosis and was advised against iron supplementation without being under the care of a provider. Repeat complete blood count 1 month later demonstrated resolution of anemia with continuation of microcytosis. The patient was cleared for full athletic participation without restriction.

Conclusion: This case represents an unusual finding from a routine preparticipation physical. Athletes with beta-thalassemia minor produce sufficient hemoglobin to supply oxygen demands but are more susceptible to exercise-induced inflammation and hemolysis which can lead to acute decreases in hemoglobin levels.