



Arthroplasty in patients with rare conditions

Total joint arthroplasty in patients with chronic infectious liver disease

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ABSTRACT

The opportunity for total joint arthroplasty (TJA) in patients with chronic infectious liver disease is rapidly expanding. This is the product of both superior survival of chronic hepatitis patients, evolving implant technologies, and improvement of techniques in TJA. Unfortunately, treating this group of patients is not without significant challenges that can stem from both intrahepatic and extrahepatic clinical manifestations. Moreover, many subclinical changes occur in this cohort that can alter hemostasis, wound healing, and infection risk even in the asymptomatic patient. In this review, we discuss the various clinical presentations of chronic infectious liver disease and summarize the relevant literature involving total joint arthroplasty for this population. Hopefully, through appropriate patient selection and perioperative optimization, treating surgeons should see continued improvement in outcomes for patients with chronic infectious liver disease. Copyright © 2016 Published by Elsevier Inc. on behalf of American Association of Hip and Knee Surgeons. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

Medical advances in recent years have improved the morbidity and mortality of many chronic conditions. Chronic infectious liver conditions are now associated with superior survival outcomes, and as such, garner increased attention from care providers as challenges associated with increased longevity are encountered [1,2].

Technological advances in techniques and materials of total joint arthroplasty (TJA) have allowed for longer implant survival and the ability to treat younger patients [3–5]. This convergence has generated an overlap between chronic infectious liver disease patients and TJA that mandates the attention of orthopedic surgeons and collaborating providers caring for this challenging population.

Case history

A 57 year-old male patient was referred for evaluation. He was status post bilateral TKA. The left TKA was performed 3 years and 11

months previously, and the right TKA was performed 3 years and 6 months previously. The patient had been experiencing worsening pain in the left knee, now rated 10/10, and was unable to weight bear on the knee for the past 6 weeks, requiring a power scooter for general mobility. Images at initial presentation are shown in Fig. 1.

Examination at that time demonstrated an obtunded patient with a BMI of 35.9. He had well healed incisions, with a symmetric range of motion from 20 to 100°. There was a mild effusion and tenderness at the femur and tibial aspects of the left knee, with inability to bear weight on the limb. Lab values included WBC 4.2k, CRP 1.3, Hgb 9.3, and a platelet count of 76. Two recent knee aspirations performed at our center demonstrated no evidence of bacteria on the gram stains or final cultures. Synovial WBC count was initially 720 with 60% neutrophils, and the second aspirate performed four months later revealed 1980 WBC with 83% neutrophils.

During the initial examination, the patient was frankly disoriented and incoherent and was spoken for by his wife, who advocated for him to seek surgical intervention for his knee pain. He had a well-established history of viral hepatitis with cirrhosis, and had been admitted for hepatic encephalopathy 4 to 5 times over the past 2 years at various local hospitals. After a brief orthopedic exam, the patient was removed from the office by emergency rescue and admitted to the hospital directly, where he was treated once again for encephalopathy and ultimately released.

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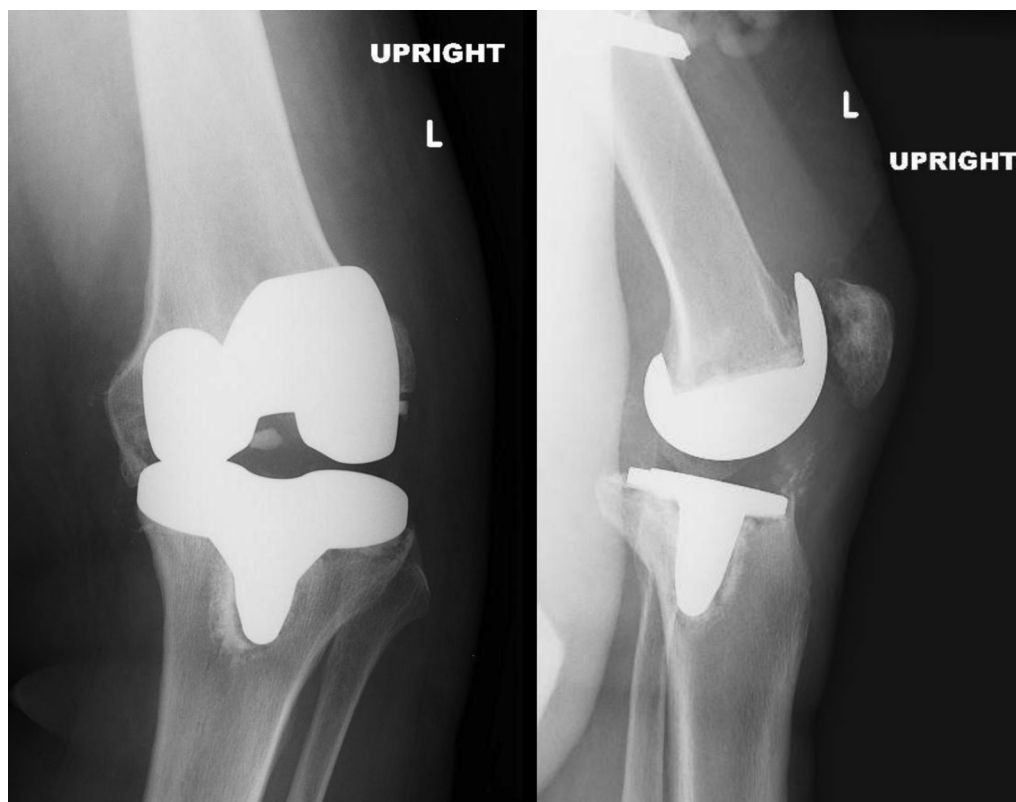


Figure 1. Pre-operative radiographs at initial presentation demonstrating prior left TKA.

Further information was then obtained from the patient's internist and gastroenterologist. Records revealed a diagnosis of Hepatitis C, Type 2b. Known co-morbidities included neutropenia, anemia, thrombocytopenia, and cirrhosis with established portal hypertension. A prior transjugular intrahepatic portosystemic shunt (TIPS) procedure had already been performed to help stabilize his cirrhosis.

RNA Viral load three years prior to his presentation above was 196552 IU/mL (reference 0–615 IU/mL) and both Hepatitis A and B testing were non-reactive. His MELD score at that time was 10. Albumin was 2.8 G/dL (Ref Range: 3.5–5.5 G/dL) and total protein was 7.4 G/dL (Ref Range: 6–8.3 G/dL). Within a year of presentation, records revealed his MELD score had climbed to 15, with an RNA viral load of 560431 IU/mL. Three months prior to presentation, his ammonia level was 108 ug/mL (reference 17–80 ug/mL), and the albumin had improved to 3.1 G/dL.

After the patient's encephalopathy was clinically stabilized he expressed a clear desire to seek treatment for his left knee, and then underwent further preoperative testing with the support of his medical physicians. It was felt that he was optimized to the best degree achievable at that time, and that the potential benefit of revision TKA for this patient outweighed the risks for complications.

Scintigraphic testing with a 3-phase bone scan was conducted (Fig. 2), revealing increased activity at the left knee on all three phases. Delayed images showed diffuse, marked uptake on both sides of the left knee joint suspicious for a prosthesis infection. A radio labeled Indium WBC scan (Fig. 3) demonstrated an area of focal uptake on the medial left knee without concordant uptake on the bone marrow scan, therefore suspicious for infection. Preoperative labs revealed an ESR of 52, and INR of 1.5, and a CBC showed a WBC of 2.8, hemoglobin 8.8, and platelets of 96k.

Intraoperative findings revealed diffuse thickening of the synovium with no purulence, and gross loosening of the femur and

tibial components of the TKA. The failed rotating-platform TKA was then revised in a single-stage fashion. Cemented stems with metal component augmentation was used with retention of the well-fixed patellar resurfacing button, and a constrained implant design (Triathlon TS, Stryker Corporation, Kalamazoo, MI, USA) was selected given his significant intra-operative periarticular tissue laxity (Fig. 4) Intraoperative frozen sections revealed an average of 2 neutrophils per high power field. Cultures of joint fluid, and two tissue cultures showed no bacteria on any gram stains or final cultures, and both fungal and AFB stains and cultures were also negative.

Postoperatively, the patient was given a compressive dressing with a knee immobilizer for two weeks while being allowed to weight bear as tolerated on the left lower extremity. DVT prophylaxis with Lovenox 40 mg SC Daily was initiated and maintained for 4 weeks, and his Aspirin 81 mg daily dose was continued throughout. The patient healed uneventfully in the early phase of recovery. At the time of this report, he is now 2 years and 6 months postop. He has regained the ability to walk and continues to use a cane for balance. ROM of the left knee is from 0 to 120 with stable collateral exam and smooth patellar tracking. He reports intermittent fatigue and is intermittently somnolent, but is able to complete all ADL's and continues to be independent at baseline. No further viral load testing is available at this time.

Discussion

Epidemiology

Chronic infectious liver conditions span a diverse set of patients stemming from multi-faceted modes of transmission. Such modes result in new infections across all age groups. Since the broad adaptation of the hepatitis B vaccine into medical practice, the

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