Knee avascular necrosis in HIV patient

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Abstract

Secondary avascular necrosis of the knee is a common finding among HIV patients on anti-retroviral therapy. Incidence in this group is higher than in the general population. There is no clear understanding of the pathophysiology of the disease. It is thought to be related to the virus itself and/or anti-retroviral medications. Early recognition and management of knee pain reduces the need of extensive surgery such as total knee arthroplasty giving way to less invasive procedures like core decompression thus, reducing the risk of more serious complications.

Index Words: bilateral, knee, avascular necrosis, HIV patient

Case Report

Case of a 52 year old female with history of HIV, CD4: 350 with unknown viral load, diagnosed 24 years ago and chronic smoker who presented to the orthopedic surgery clinic with chief complaint of left knee pain x three months of evolution. Pain was described as sharp, 10/10 in intensity, constant, and diffuse with no radiation. Worsened when going from sitting to standing position. Alleviated with none. Referred no improvement despite being on pain medications and physical therapy. Patient started antiretroviral therapy 5 years after diagnosis. Her therapy consists of Ritonavir (protease inhibitor), Atazanavir, Truvada (emtricitabine/tenofovir-NRTI).

Physical exam showed a well nourished 5’3” female weighing 140 pounds. Left knee had no swelling or erythema, joint line tenderness, painful range of motion, and crepitus. Right knee with normal findings. Other articulations have normal findings. Skin and Neurological exam intact.

Figure 1A and 1B. Standing AP and LAT X-ray respectively of bilateral knees showed lesions that involve diaphysis, metaphysis and epiphysis with central lucency and surrounding sclerosis with adequate joint line space.

Fig. 1A

Patient was referred to a reconstructive knee surgery specialist after the above findings.

Conclusion

Secondary osteonecrosis of the knee secondary to anti-retroviral therapy or HIV is a concern among these patients. Clinicians need to be aware of the subtle yet frequent complications of AVN in patients on ARV therapy, especially those patients on protease inhibitors. Early recognition and management of knee pain has been proven to reduce the need of extensive surgery giving way to less invasive procedures like core decompression thus, reducing the risk of more serious complications.

References

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Background

Avascular necrosis (AVN), also termed osteonecrosis, indicates ischemic death of the bone as a result of insufficient arterial blood supply (1-3). The incidence rate of AVN has been reported to be 0.135% in the general population, although incidence rates ranging 0.3-0.45% have been observed in HIV-infected patients, most commonly in the hips (1-3). Although the exact etiology of osteonecrosis remains unclear, predisposing factors, such as HIV-related complications, an adverse event of highly active antiretroviral therapy (HAART) or a result of a HIV-associated disease, have been suggested (4). There are reports suggesting an association between protease inhibitors and a decreased bone density in patients (5-7). Although it should be noted that AVN was reported before the era of ARV therapy, evidence suggesting HIV virus as the only risk factor for the development of avascular necrosis is limited (5-6). Secondary avascular necrosis of the knee is more common in women below 55 years with risk factors. Typically involves more than one compartment of the knee or even the metaphysis. 80% are bilateral. It presents with pain in weight bearing, especially sitting to standing.

Case Report

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Physical exam showed a well nourished 5’3” female weighing 140 pounds. Left knee had no swelling or erythema, joint line tenderness, painful on movement, especially when bearing weight, especially sitting to standing. Neurological exam intact. Other articulations have normal findings. Skin and ROM, and crepitus. Right knee with normal findings.

Figure 1A and 1B. Standing AP and LAT X-ray respectively of bilateral knees showed lesions that involve diaphysis, metaphysis and epiphysis with central lucency and surrounding sclerosis with adequate joint line space.

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Secondary avascular necrosis of the knee is a common finding among HIV patients on anti retroviral therapy. Incidence in this group is higher than in the general population. There is no clear understanding of the pathophysiology of the disease. It is thought to be related to the virus itself and/or anti-retroviral medications. Early recognition and management of knee pain reduces the need of extensive surgery such as total knee arthroplasty giving way to less invasive procedures like core decompression thus, reducing the risk of more serious complications.

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References


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Presented at the American Rhinologic Society at the American Academy of Otolaryngology Annual Meeting. Orlando, Florida September 20 / 2014

Abstract

A 9 year-old male sustained multiple maxillofacial fractures after falling from a two-story building. Frontal sinuses suffered a bilateral non-displaced linear fractures extending into the anterior and posterior walls. Magnetic resonance imaging (MRI) at this time showed a small encephalocele extending into the right frontal sinus. Operative repair was performed using an Endoscopic-Assisted Trephination approach.

KEYWORD LIST: Frontal Sinus Fracture, Trephination, Endoscopic

Introduction

Facial trauma with the necessary force to cause a frontal sinus fracture is commonly associated with base of skull and intracranial injuries.1 The management objective in these fractures is to avoid potential complications while attempting to restore adequate aesthetics and functional- ity. When surgical management is indicated, developments in endoscopic surgery have recently provided a treatment option less morbid than traditional sinus obliteration or craniolization.2 This report is in compliance with the institutional review board regulations of the University of Puerto Rico School of Medicine.

Case report

A 9 year-old male sustained multiple maxillofacial fractures after falling from a two-story building. Frontal sinuses suffered a bilateral non-displaced linear fractures extending into the anterior and posterior walls. The right frontal sinus posterior wall showed a 17 millimeters (mm) osseous defect. Physical examination revealed bilateral periorbital ecchymosis without evidence of rhinorrhea. Patient was eventually intubated and transferred to an Intensive Care Unit with guarded prognosis. Five days later despite prophylactic antibiotics patient developed fever and leukocytosis and a lumbar punctured confirmed meningitis. Patient was treated with intravenous antibiotics adequately. Magnetic resonance imaging (MRI) at this time showed findings consistent with meningitis and diffused axonal injury. In addition, the right frontal sinus showed a small encephalocele extending into the frontal sinus. Operative repair was performed using an Endoscopic-Assisted Trephination approach.3 A 10mm posterior table defect was identified at the posterior wall. The herniated brain parenchyma had been reduced spontaneously but there was evidence of Cerebrospinal Fluid (CSF) leakage. The posterior wall was then reconstructed with an overlay of dura regeneration matrix followed by an overlay placement of cartilage, mucosa and fibrin sealant in that order. A titanium mesh was used for restoration of the anterior wall. Mucosa of the frontal sinus outflow tract was partially compromised and after widening the drainage a temporary stent was placed. Patient recovered well and after a 4 months follow-up patient is doing well clinically and radiologically. Unfortunately, he developed permanent bilateral sensorineural hearing loss for which bilateral cochlear implants were programmed.

The frontal bones represent the strongest structure in the face and a significant amount of force is required for fractures to occur. Management of these fractures are directed to the identification and treatment of intracranial injuries in the acute setting and prevention of potential complications such as CSF leakage, meningitis, encephalitis, brain abscess and aesthetic deformities.4 Traditionally, significant involvement of the posterior table required a surgical separation between the intracranial and sinonasal compartments by cranialization or obliteration of the frontal sinus.5 Nonetheless, the morbidity of these procedures is significant with common complaints of chronic frontal pain and multiple reports of delayed mucoceles. In addition, for these patient a life-long surveillance is mandatory. In a child this could represent a significant burden to his/her quality of life. Avoiding these complications and providing at least equal success to sinus