

CHRONIC RECURRENT BACTERIAL OSTEOMYELITIS OF TIBIA

YUSRA HABIB KHAN, AZMI SARRIFF, AMER HAYAT KHAN

Received: 05 Jun 2012, Revised and Accepted: 17 July 2012

ABSTRACT

Chronic osteomyelitis is a relentless and incapacitating infection of bone marrow and bones. Mostly, it is regarded as a recurring condition due to lengthy treatment course. Eradication of disease requires significant dedication from both patient as well as healthcare professionals. As host morbidities play an important role in propagation of infection, therefore each patient with chronic osteomyelitis requires individualized treatment regime. The following is a case of chronic osteomyelitis that was first encountered due to open fracture injury as a result of motor vehicle accident. The case is of special interest as despite of under various treatments for 4 years, patient is still suffering from morbidity of osteomyelitis.

INTRODUCTION

Chronic osteomyelitis is defined as a severe infection of bone that either persists for more than six weeks or relapse after completion of appropriate antibiotic therapy. In more than 80% of cases, osteomyelitis results from either contiguous spread or from open wounds. Open wounds can be a result of bone surgery or contaminated open fractures. Osteomyelitis is often poly microbial with staphylococcus being the causative agent in more than 50% of cases. Other causative agents include a variety of gram positive as well as gram negative bacteria, anaerobes, mycobacteria or even fungi etc.[1]

Aim of the treatment is to resolve infection and to maximize patient's quality of life. Therefore, a multimodality approach involving lengthy antibiotic regimen along with extensive removal of infected debridement of bone is used. Both appropriate antibiotic coverage and thorough debridement aim to eradicate the causative agent of infection as well as removal of all necrotic bones, soft tissues and drainage of abscesses. Treatment of osteomyelitis begins with empirical antibiotic therapy usually at the time of debridement. Empirical antibiotics used must be broad spectrum so that a wide range of suspected pathogens can be covered. Once culture and sensitivities results are obtained, tailored antibiotic therapy against causative agent is initiated. [2] Culture directed antibiotic should be initiated after confirmation of causative agent by biopsy and once thorough surgical debridement has been done. In most cases of chronic osteomyelitis inadequate debridement is the most frequent cause of failure of antibiotic therapy. In addition to the treatment described above, limitation of movement, rest and periodic re-evaluation of both therapy and complications is recommended.

Case Presentation

In June 2008, a 29 years old female was referred to hospital University Sains Malaysia (HUSM, Kelantan) due to MVA (motor vehicle accident) resulting in sustained open proximal right tibia with three 1 cm open wounds, fracture at the neck of fibula and peroneal nerve palsy. Immediately after admission to hospital, she had undergone operation for debridement of wound and insertion of buttress plate at right tibia. However, a few hours after surgery her leg swelled and hemarthrosis occurred. Pus was aspirated from her leg for culture and sensitivity test. The results of the test identified Enterobacter species as the causative agent of infection. Erythrocyte sedimentation rate (ESR) at that time was 83 (Normal value: 0-15 for female). A second surgery was done for complete debridement of wound. After a few days she had undergone reconstructive surgery. During reconstructive surgery, emergency exploration for congested thoracodorsal artery perforator (TAP) flap was done, which was then covered with skin allograft. She was admitted to ICU for 3 days post operation, where she developed a low grade wound infection (presence of fever without discharge of pus from the wound). She was treated with appropriate antibiotics and chlorhexadine was used to cleanse the wound. On second reconstructive surgery, she had small wound breakdown which was treated consecutively with dressing and oral antibiotic.

Six months later, she was again admitted to HUSM for muscle flap surgery. During surgery two small areas of wound breakdown with hyper granulating tissues were identified. She was diagnosed with osteomyelitis tibia and again antibiotic (Ciprofloxacin) was prescribed. On July 2009, she went through a surgery in order to remove buttress plate as she had infected tibia implant at right lower leg. Within 18 months interval, she complained of dried pus at right tibia for previous one month. X-rays reported new osteomyelitis at proximal right tibia. She started on Fusidic acid and Cloxacillin for 6 weeks. Despite completion of 6 week course of antibiotics, in Jan 2011 she was still having serious pus discharge. During her 6 week course of antibiotic, her ESR continued to remain high i.e. 39. Wound debridement and sequestrectomy was done. A slough was found at sequestrum site and proximal tibia but no pus was detected. A culture and sensitivity test was done and *Pseudomonas aeruginosa* was found in slough while *Pseudomonas Faccalis* was found in sequestrum. She was again diagnosed with chronic osteomyelitis of right tibia and was prescribed a 2 week course of antibiotics. (Ciprofloxacin, penicillin, fusidic acid and cloxacillin). Even after completion of course of antibiotics, patient still complains of discomfort and discharge of small amount of pus from her lower right leg.

DISCUSSION

The authors describe the case of a woman suffering from chronic osteomyelitis. Chronic osteomyelitis is an osseous infection that progresses to bone necrosis and sequestrum formation despite completion of appropriate antibiotic regimen or presence of dead bone on X-ray. Necrosis of bone, as a result of chronic osteomyelitis, leads to formation of dead bone. The dead bone act as a host for pathogenic micro-organisms. Due to severe infection, the immune system of host is not intact enough to combat with pathogenic micro-organisms. Antibiotics are unable to reach site of infection due to disrupted blood flow. For this reason debridement is done for complete removal of dead bone.[3] In current case, before reconstructive surgeries, patient has undergone wound debridement twice and prescribed course of antibiotics has been fully completed. Still patient developed infection as indicated by continuous drainage of pus. The possible reason for development of infection might be infection of wound acquired during surgery or incomplete wound debridement. Even after two reconstructive surgeries, patient suffered from wounds breakdown that were treated concurrently with chlorhexadine. Chronic osteomyelitis, which has not been completely treated by primary interventions such as antibiotics regimen, debridement or even bone grafting, is then treated by muscle flap coverage. Study shows that muscle flap coverage shows higher success rate as compare to other treatment options.[4] This patient has also undergone muscle flap surgery but even then patient continued to suffer from infection as shown by continuous pus drainage and high ESR. During span of four years, patient has undergone several reconstructive surgeries, muscle flap surgery, courses of antibiotics but still she is unable to recover. Possible reasons for failure of therapy might be incomplete wound debridement resulting in presence of dead bone that acts as a barrier for

antibiotics. Secondly, infection of wound during surgery or non-compliance, on part of patient, to take prescribed antibiotics for long duration can explain persistence of infection.

CONCLUSION

Chronic osteomyelitis is a condition associated with potentially high morbidity and even more risk of mortality. While maintaining optimal physiological functions in patients, resolution of infection is the primary goal of treatment. Multi-drug resistant osteomyelitis may still be uncommon but healthcare professional especially orthopedic specialists should be aware of this rare side of disease in order to cope up with the challenges involved in the treatment of chronic osteomyelitis. Furthermore, 3D bone scan should be

performed to rule out occult infection and possible reason for continuous failure of therapy.

REFERENCES

1. Layne O. Gentry. Management of osteomyelitis. *International Journal of Antimicrobial Agents* 1997(9):37-42
2. Henry S. Fraimow. Systemic Antimicrobial Therapy in Osteomyelitis. *SeminPlast Surg.* 2009 May; 23(2): 90-99
3. Tibia osteomyelitis. <http://www.ilizarov.com/en/tibia-osteomyelitis/> (accessed 22nd May 2012)
4. Koval KJ, Meadows SE, Rosen H, Silver L, Zuckerman JD. Posttraumatic tibial osteomyelitis: a comparison of three treatment approaches. *Orthopedics.* 1992 Apr;15(4):455-60.