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Case Report

Septic arthritis of the hip caused by nontyphoidal salmonella: A case report

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ABSTRACT

Salmonella nontyphoidal (NTS) infection can cause bacteremia, enteric fever, and gastroenteritis. However, NTS-induced osteoarticular infections are uncommon. We describe a 65-year-old man who had a right hip infection brought on by NTS. He was successfully treated with staged procedures of debridement and antibiotic mobile spacer insertion followed by an Uncemented hip replacement as the second stage. He was doing well free of recurrence at the 8 year follow up. Septic parameters at this time were normal. This case is given since there have been few cases of hip joint infection caused by NTS. Prompt detection and diagnosis of the organism is crucial.

Articular erosion and joint destruction once proved, in delayed presentations, will need radical debridement for eradication of the infection. The use of a prosthesis made of antibiotic-loaded acrylic cement and prolonged antimicrobial therapy is necessary.

1. Introduction

Salmonellae is a group of pathogenic bacteria that belong to the family Enterobacteriaceae, which causes multiple enteric diseases in humans. Due to their many manifestations and the fact that some strains can infect abnormal areas like the extra intestinal regions, they are attracting more and more attention from the scientific community globally today.[1–3] In the poor world, these various related disorders have created new treatment issues. According to reports, there are 3.4 million salmonella illnesses worldwide each year.[4,5] It is a significant issue for public health in emerging nations like India. The growth of multidrug resistance is leading to an increase in morbidity and death caused by these illnesses.[6]

In this article, we're going to look at a case of a delayed diagnosis of hip septic arthritis due to NTS infection, in a patient who did not have any underlying diseases. The patient was successfully treated with a two-stage hip joint reconstruction and long-term antimicrobial therapy.[6] The patient was informed that data from the case would be submitted for publication, and his consent was taken for the same.

2. Case Presentation

A 65-year-old male presented with complaints of pain in right hip associated with high grade fever. The pain was sudden in onset with no preceding history of trauma. Progressively it became increasingly difficult for him to sit or walk. There was no prior history of such pain but for low back pain few years back. After 3 days of the onset of pain, the patient decided to get admitted at the nearby hospital and was treated conservatively with antibiotics after which the fever subsided but the pain persisted. He presented to our clinic 3 months following the onset. Patient was a known case of hypertension and was well controlled with the treatment. He had no history

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of other immunocompromising diseases, such as sickle cell anaemia, diabetes mellitus or human immunodeficiency virus. He had watery diarrhoea and a febrile episode that lasted for 2 weeks. On examination the right hip was in flexion and external rotation. The hip ROM was painful and restricted. Radiography of pelvis with both hips and right hip lateral view (Figure 1) demonstrated significant joint space narrowing with subarticular sclerosis and cystic changes seen along the right hip joint.

Figure 1: Demonstrated significant joint space narrowing with subarticular sclerosis and cystic changes seen along the right hip joint

MRI revealed evidence of inflammation and fluid collection in right hip joint with destruction of the articular cartilage on both the side of the joint. It gave the additional important information that the collection of the fluid with broken compartment which is more suggestive of septic arthritis associated with osteoarthritic changes involving right hip joint (Figure 2).

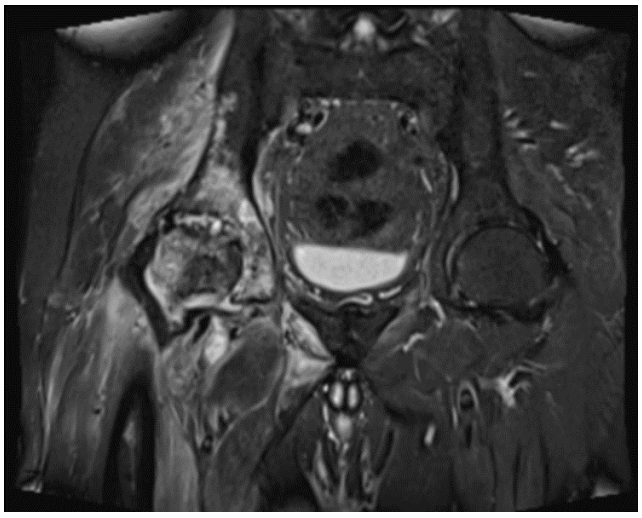

Figure 2: Reduced right hip joint space with destruction of articular cartilage. There is fluid collection in right iliopsoas muscle with small collection in muscles of anterior and medial compartment

Laboratory investigations showed:

1. C-reactive protein (CRP) level of 143 mg/L (normal range, 0–10 mg/L),
2. Erythrocyte sedimentation rate (ESR) of 33 mm/h (normal range, 0–20 mm/h),
3. Serum white blood cell (WBC) count of 7520/cmm (normal range, 4000-10000 / cmm).
4. Aspiration of right hip joint yielded cloudy yellow synovial fluid with a WBC count of 46,728/mm3 (93% polymorphonuclear neutrophil leukocytes). Salmonella serogroup D (nontyphoid) were grown in culture from aspirated synovial fluid.

As there was hip joint destruction due to prolonged exposure to NTS, we decided to perform a two- stage revision surgery using a posterolateral approach right hip. After the femoral head and neck was resected, all acetabular inflammatory tissues were debrided and excised. Copious lavage wash given with normal saline, vancomycin and gentamycin.Highly polished thinnest femoral stem was loaded with antibiotic cement. Hand held cementing done over the femoral head prosthesis matching the size of the patients resected femoral head (Figure:3). The antibiotics used for the cement were of 2 gentamycin 40 g pouch (Depuy CMW). Here, our institution's routine protocol was used to devise the cement spacer for joint infection.

Figure 3: Anteroposterior and lateral radiograph of the hip taken after first-stage surgery

Inj. ceftriaxone 2 g iv BD and Inj. Ofloxocin 2 units iv BD was initiated for 6 weeks with weekly assessment of CBC,CRP,ESR. After 6 weeks of antibiotic treatment, his CRP level reduced to 8 mg/L, his ESR was 19 mm/hr, and serum WBC count was 6800 /cmm. One month after the antibiotic treatment was discontinued, the infection markers were re-checked and was found within normal limits and the patient underwent conversion to total hip arthroplasty. Same surgical approach was used as stage one. For the identification of previously dissected tissue plane, nonabsorbable monofilament sutures were used in the stage one surgery which eased the exposure for second stage. A cementless femoral component (Solution stem-Depuy Synthes) and 36mm ceramic femoral head and a cementless acetabular component (Pinnacle cup and highly

crossed polyethylene (Depuy Synthes) were used. The acetabular cup was augmented with two 6.5mm cancellous screws (Figure 4). Samples were taken during the second step of reimplantation for histological and microbiological research. There was no evidence of any infection.

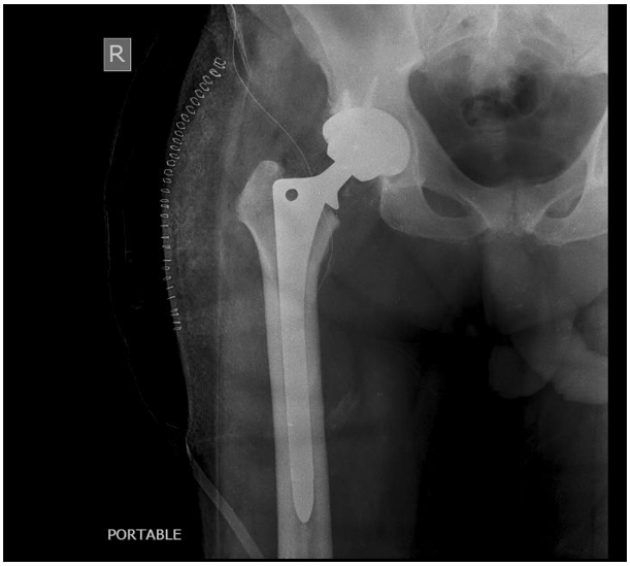

Figure 4: Anteroposterior radiograph of the right hip taken after second-stage surgery

At a 5-year follow-up, the patient's CRP level was 4 mg/L, ESR was 18 mm/h, and the serum WBC count was 5200 /cmm suggestive of no recurrence of the disease. Good bone in-growth was seen around the implant with no sign of osteolysis or lucency (Figure 5).

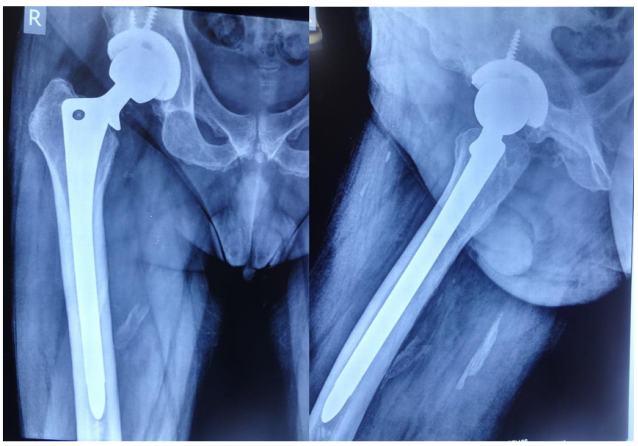

Figure 5: Anteroposterior and lateral radiograph of the right hip taken 5 years after surgery, indicating good bone ingrowth without osteolysis

The Harris hip score (HSS) was 95 points and Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) score was 31 points.

3. Discussion

Adults with septic hip arthritis are quite uncommon, with an incidence of 2 to 10 per 100,000 person-years.[7–9] It is, nonetheless, a potentially alarming illness. Bacterial enterotoxins and the host's immunological reaction to germs may both directly and indirectly cause septic arthritis to destroy cartilage.[10–12] Joint degeneration, osteonecrosis, and joint instability can all result from delayed treatment of joint infections.[13,14] Only 1% of cases of septic arthritis are caused by salmonella typhoid.[15] Typhoid and nontyphoid combined, the incidence of septic arthritis caused by salmonella is thought to be less than 0.1%-0.2% among the extraintestinal sequelae.[16–18] The prevalence of NTS-related bone and joint infection among all salmonella cases in India is 0.06%.[11] Additionally, people with underlying conditions such sickle cell disease, systemic lupus erythematosus, an immunological state, and diabetes mellitus are more likely to develop septic arthritis.[3,9] Although there were no underlying medical issues in our case, the organism may have been exposed for a longer period of time as a result of the fever and hip pain's insufficient treatment and delayed identification.[19,20] Within months of the fever's commencement, this virus caused the loss of all joint space. Complete debridement was challenging due to the hip joint's severe articular damage and periarticular osteomyelitis. Therefore, employing local antibiotic therapy, we completed phased repair for right septic hip arthritis.[21–23] The preferred treatment for salmonella infection is a third-generation cephalosporin, however there have been occasional instances of antibiotic resistance in NTS serotypes.[24,25] Antibiotic susceptibility testing on our patient helped in the selection of the best medications for the effective eradication of the NTS infection.

4. Conclusion

Here, a rare case of NTS infection-related septic arthritis of the hip in a patient who had no other underlying medical problems was presented. In the management of the destroyed and disintegrated septic hip joint brought on by delayed diagnosis of NTS infection, a two-stage revision hip arthroplasty using a prosthesis made of antibiotic-loaded acrylic cement spacer and prolonged antimicrobial therapy should be taken into consideration.

5. Source of Funding

None.

6. Conflict of Interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

1. Ao TT, Feasey NA, Gordon MA, Keddy KH, Angulo FJ, Crump JA. Global burden of invasive nontyphoidal Salmonella disease, 2010(1). *Emerg Infect Dis*. 2010;21(6):941–9.
2. Stanaway JD, Parisi A, Sarkar K, Blacker BF, Reiner RC, Hay SI, et al. The global burden of non-typhoidal salmonella invasive disease: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet Infect Dis*. 2017;19(12):1312–24.
3. Sudhaharan S, Kanne P, Vemu L, Bhaskara A. Extraintestinal infections caused by nontyphoidal Salmonella from a tertiary care center in India. *J Lab Physicians*. 2018;10(4):401–5.
4. Chen JY, Luo SF, Wu YJ, Wang CM, Ho HH. Salmonella septic arthritis in systemic lupus erythematosus and other systemic diseases. *Clin Rheumatol*. 1998;17(4):282–7.
5. Fu TS, Ueng WN, Shih CH, Luo SF. Total hip arthroplasty in Salmonella coxitis: four cases report. *Changgeng Yi Xue Za Zhi*. 1998;21(1):109–18.
6. Huang JL, Hung JJ, Wu KC, Lee WI, Chan CK, Ou LS. Septic arthritis in patients with systemic lupus erythematosus: salmonella and nonsalmonella infections compared. *Semin Arthritis Rheum*. 2006;36(1):61–7.
7. Choi KM, Park CS, Song GW, Lee SG. Non-typhoid salmonella septic arthritis in dual living liver transplant recipient: a case report. *Korean J Hepatobiliary Pancreat Surg*. 2014;18(1):29–32.
8. Compain C, Michou L, Orcel P, Hannouche D, Richette P. Septic arthritis of the hip with psoas abscess caused by Non-typhi Salmonella infection in an immunocompetent patient. *Joint Bone Spine*. 2008;75(1):67–9.
9. Mansour E, El-Masri F. Bilateral Salmonella septic arthritis of the hip in a patient with Crohn disease: a case report. *JBJS Case Connect*. 2016;6(4):e91.
10. Hohmann EL. Nontyphoidal salmonellosis. *Clin Infect Dis*. 2001;32(2):263–9.
11. Jones TF, Ingram LA, Cieslak PR, Vugia DJ, Tobin-D'Angelo M, Hurd S, et al. Salmonellosis outcomes differ substantially by serotype. *J Infect Dis*. 2008;198(1):109–14.
12. Harris WH. Traumatic arthritis of the hip after dislocation and acetabular fractures: treatment by mold arthroplasty. An end-result study using a new method of result evaluation. *J Bone Joint Surg Am*. 1969;51(4):737–55.
13. Bellamy N, Buchanan WW, Goldsmith CH, Campbell J, Stitt LW. Validation study of WOMAC: a health status instrument for measuring clinically important patient relevant outcomes to antirheumatic drug therapy in patients with osteoarthritis of the hip or knee. *J Rheumatol*. 1988;15(12):1833–40.
14. Gruen TA, Mcneice GM, Amstutz HC. "Modes of failure" of cemented stem-type femoral components: a radiographic analysis of loosening. *Clin Orthop Relat Res*. 1979;141:17–27.
15. DeLee JG, Charnley J. Radiological demarcation of cemented sockets in total hip replacement. *Clin Orthop Relat Res*. 1976;121:20–32.
16. Goldenberg DL. Septic arthritis. *Lancet*. 1998;351:197–202.
17. Riegels-Nielson P, Frimodt-Moller N, Jensen JS. Rabbit model of septic arthritis. *Acta Orthop Scand*. 1987;58(1):14–9.
18. Choi IH, Pizzutillo PD, Bowen JR, Dragann R, Malhis T. Sequelae and reconstruction after septic arthritis of the hip in infants. *J Bone Joint Surg Am*. 1990;72(8):1150–65.
19. Wada A, Fujii T, Takamura K, Yanagida H, Urano N, Surijamorn P. Operative reconstruction of the severe sequelae of infantile septic arthritis of the hip. *J Pediatr Orthop*. 2007;27(8):910–4.
20. Shanthi M, Sekar U, Sridharan KS. Septic Arthritis of Hip Caused by Salmonella typhi: A Case Report. *Case Rep Infect Dis*. 2012;2012:464527. doi:10.1155/2012/464527.
21. Ray U, Dutta S, Sutradhar A. An Unusual Case of Septic Arthritis of the Hip. *J Clin Diagn Res*. 2016;10(11):3–5.
22. Romanò CL, Romanò D, Meani E, Logoluso N, Drago L. Two-stage revision surgery with preformed spacers and cementless implants for septic hip arthritis: a prospective, non-randomized cohort study. *BMC Infect Dis*. 2011;11:129.
23. Diwanji SR, Kong IK, Park YH, Cho SG, Song EK, Yoon TR. Two-stage reconstruction of infected hip joints. *J Arthroplasty*. 2008;23(5):656–61.
24. Chen HM, Wang Y, Su LH, Chiu CH. Nontyphoid salmonella infection: microbiology, clinical features, and antimicrobial therapy. *Pediatr Neonatol*. 2013;54(3):147–52.
25. Dunne EF, Fey PD, Kludt P, Reporter R, Mostashari F, Shillam P, et al. Emergence of domestically acquired ceftriaxone-resistant Salmonella infections associated with AmpC beta-lactamase. *JAMA*. 2000;284(24):3151–6.

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