

Use of Tri-calcium phosphate Crystals with Cefuroxime Axetil Powder in skeletally immature patient of Femur Osteomyelitis : Case report

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Abstract:

Background- Osteomyelitis is a difficult entity to manage. In skeletally immature patients this problem gets a whole new dimension. Bone Grafting in these patients has a quantitative restriction. Management for our patient of 14 years old femur osteomyelitis included debridement, external fixation, systemic antibiotics and Tricalcium Phosphate Crystals with cefuroxime powder. There was no discharging sinus post op. Consolidation of the TCP crystals in the bone matrix took 5 months. Functional recovery is near normal.

Key words: Tricalcium Phosphate, Osteomyelitis

Introduction

Osteomyelitis in skeletally immature patient is a great challenge to manage. Intravenous antibiotic therapy is a major part of treatment regime. Experimental studies of bone graft substitute mixed with antibiotics have shown good osteoconductive effect and optimum local antibiotic concentration [1].

Studies of cefuroxime axetil with Tricalcium phosphate combination in osteomyelitis in adult, is documented to have a very good consolidation in bone matrix and optimum local antibiotic concentration [2-6]. We used the same combination for a case of femur osteomyelitis in a 14 year old skeletally immature male patient

Case Report

A 14 years old male came with chief complaints of pain and swelling in left thigh since 8 months. Pain started as insidious in onset and was associated with high grade fever and chills with swelling in left thigh without any known predisposing factors, and was relieved with medication. He consulted an orthopaedic surgeon and was operated for presumed bone infection and was advised nonweight bearing mobilization. Patient presented with above complaints 2 months post surgery and 8 months after the initial symptoms to our hospital for further management. On presentation he had

diffuse swelling on left thigh with no scars and sinuses, no limb length discrepancies. Patient could not bear weight on left leg. Patient has pallor and intermittent rise of temperature. On Radiographic investigations it was apparent the he was a case of osteomyelitis of left femur for which debridement and saucerisation was done in past. He was given Thomas splint for suspected pathological fracture.

Management : After improving his general condition and controlling his constitutional symptoms he was operated for external fixation. After settling of infection at the affected site, Debridement of site with instillation of Tri-calcium phosphate crystals mixed with Cefuroxime Axetil powder was done. He was under cover of IV Cefuroxime with Amikacin.

Follow Up – On successive follow up visits pin tracts were dressed and serial xrays were taken which showed considerable amount of consolidation and absorption of TCP crystals in the bone healing process. 4 months postop the External fixator was removed and he was given functional femur brace on which weight bearing as per tolerance, was continued. Currently the patient has good functional outcome with no pain and swelling on weight bearing, reasonable freedom for squatting and doing his activities for daily living independently.

Discussion

Chronic osteomyelitis in skeletally immature patients is a disease with devastating functional compromise if not managed correctly. Debridement leads to sacrificing lot of bone tissue. Autologous Bone Grafting in skeletally immature patients has restriction in terms of quantity and thus makes it difficult to fill larger bone losses.

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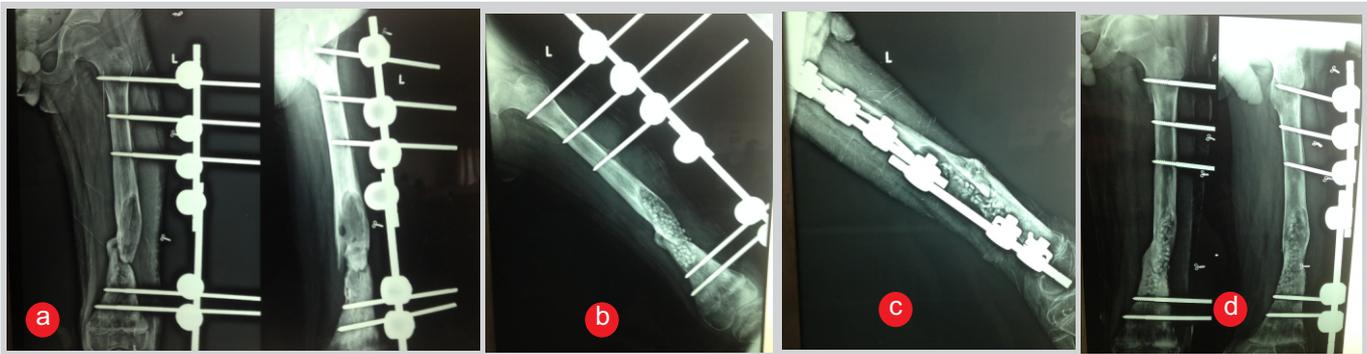


Figure 1: a- Preoperative radiograph showing osteomyelitis of the femur stabilized with external fixation. b,c- Post operative radiograph with TCP Crystals. d-follow up radiograph showing partial resorption of TCP crystals



Figure 2:a- radiograph showing consolidation of the bone with good union. b,c showing good clinical outcome

Bone graft substitutes have been used to fill such large bone gaps. They provide osteoconductive effect after getting consolidated in the bone matrix. Use of these Bone Graft substitutes with an antibiotic is also a regular practice for improving local antibiotic concentration and supplement systemic antibiotics, although the evidence is restricted to adults only.

We decided to use a combination of an Osteoconductive bone graft substitutes in form of Tricalcium phosphate and mix it with a third generation Cephalosporin, Cefuroxime Axetil in this skeletally immature. The rationale being large bone gap to cover and Cefuroxime +TCP crystals showing good effect in experimental studies. Stabilization, debridement and using the above said combination we were able to get good consolidation of bone matrix with uneventful post op period and a reasonable functional recovery.

Conclusion: TCA crystals could be a useful alternative for bone grafts in skeletally immature patients with limitations of autografts. These crystals can be impregnated with antibiotic Cefuroxime axetil for the

use in osteomyelitis.

Summary : A 14 yrs old skeletally immature male with femur osteomyelitis, was treated with debridement, stabilization with external fixator, osteoconduction with TCA crystals (and not autografts), impregnated with Cefuroxime axetil. At the end of 5 months, there was a good consolidation, no infection and reasonable functional outcome.

References

11. Nandi, S. K., Kundu, B., Ghosh, S. K., Mandal, T. K., Datta, S., De, D. K., & Basu, D. (2009). Cefuroxime-impregnated calcium phosphates as an implantable delivery system in experimental osteomyelitis. *Ceramics International*, 35(4), 1367-1376.
2. Constantz, Brent R., Mark Fulmer, and Robert Poser. "Calcium phosphate cements comprising antimicrobial agents." U.S. Patent No. 5,968,253. 19 Oct. 1999.
3. Miyai, Takahiro, et al. "Antibiotic-loaded poly-ε-caprolactone and porous β-tricalcium phosphate composite for treating osteomyelitis." *Biomaterials* 29.3 (2008): 350-358.
4. Lambotte, J. C., et al. "[Tricalcium phosphate, an antibiotic carrier: a study focused on experimental osteomyelitis in rabbits]." *Chirurgie; memoires de l'Academie de chirurgie* 123.6 (1998): 572-579.
5. Soriano, I., and C. Evora. "Formulation of calcium phosphates/poly (d,l-lactide) blends containing gentamicin for bone implantation." *Journal of controlled release* 68.1 (2000): 121-134.
6. Soundrapandian, Chidambaram, et al. "Local drug delivery system for the treatment of osteomyelitis: In vitro evaluation." *Drug development and industrial pharmacy* 37.5 (2011): 538-546.

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