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Ring sequestrum of proximal tibia in a polytrauma patient: A case report

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Abstract
Ring sequestrum has become a rare presentation in modern day orthopaedics. It is a low grade chronic osteomyelitis following pintract infection producing an unusual sequestrum surrounded by radiolucent area another circle of sclerotic bone. Improper aseptic technique of skeletal pin traction, thermal necrosis, prolonged duration, poor pintract care and comorbid conditions can lead to this complications and presents with skin discharge, pin loosening and osteomyelitis. Thorough surgical debridement, sequestrectomy and saucerisation with appropriate antibiotics and dead space management will successfully treat it. We report a similar case in a polytrauma patient following pintract infection.

Keywords: Polytrauma, ring sequestrum, proximal tibia, surgical debridement

Introduction
A sequestrum is infected dead bone formed as squeal of chronic osteomyelitis. Ring sequestrum is a unusual low grade osteomyelitis following pintract infection. Skeletal traction was extensively used in past, but its role in modern orthopaedics is limited with advent of newer modalities of intervention. When applied properly it serves best if not leads to necrosis, skin irritation, infection and osteomyelitis with sequestrum.
We report a case of Ring sequestrum over proximal tibia following upper tibial Pin placement in a polytrauma individual, which was treated with Excision and curettage resulted in excellent outcome.

Case Report
Appropriate consent and institutional ethical approval was obtained for this case study. A Twenty years old Male presented to our department with history of road traffic accident, four weeks ago in a foreign country and sustained multiple injuries. He was diagnosed to have head injury, fracture left shaft of femur with ipsilateral fracture posterior wall of acetabulum (< 20% wall involvement) with Right femur Hoffa's fracture along with avulsion fracture of lateral tibial condyle. After initial physiological stabilization he was treated with closed reduction and internal fixation with intramedullary device for left femur, Right distal femur and proximal tibia with open reduction and screw fixation. His left acetabulum fracture was treated conservatively with upper tibial pin traction accordingly in primary centre.
He presented to us four weeks post-surgery along with upper tibial Steinman pin in-situ. On examination all his fractures were improving clinically and radiologically. His acetabulum fracture had showed signs of healing and also prolonged Steinman pin traction was uncalled for, hence removed.
Patient came back four months later with complaints of persistent discharge over the left proximal tibial pin site, which didn't heal with appropriate antibiotics and regular dressing. Radiological examination revealed ring sequestrum over the proximal tibia and all other fractures healing well (figure 1) Due to chronic persistent dull aching pain with discharging sinus resistant to heal with conservative line of treatment, he was advised surgery. He underwent complete thorough surgical debridement, excision of sinus tract along with infected granulation tissue and sequestrum which was sent for histopathological examination (Figure 2), saucerization was done to avoid recurrence of infection, skin was closed primarily and healing was uneventful. He received routine pre-operative prophylactic antibiotics and postoperatively for six weeks. Culture of the tissue did not grow any pathogens maybe because of the chronicity of injury and pre surgical antibiotic.

Histopathological examination revealed fibro collagenous tissue with dense inflammatory cell infiltrate with necrotic bone (sequestrum), consistent of chronic osteomyelitis. At the end of twelve weeks follow up patient did not show any recurrence of infection or sinus and radiological healing was present, he was asymptomatic till latest follow up at one year other fractures also healed well.

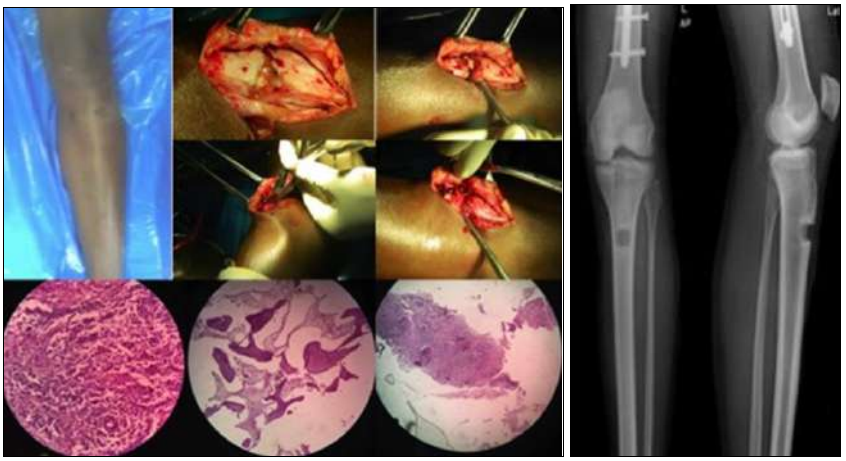

Fig 1: X-rays showing multiple fractures after stabilization and Ring sequestrum in proximal tibia

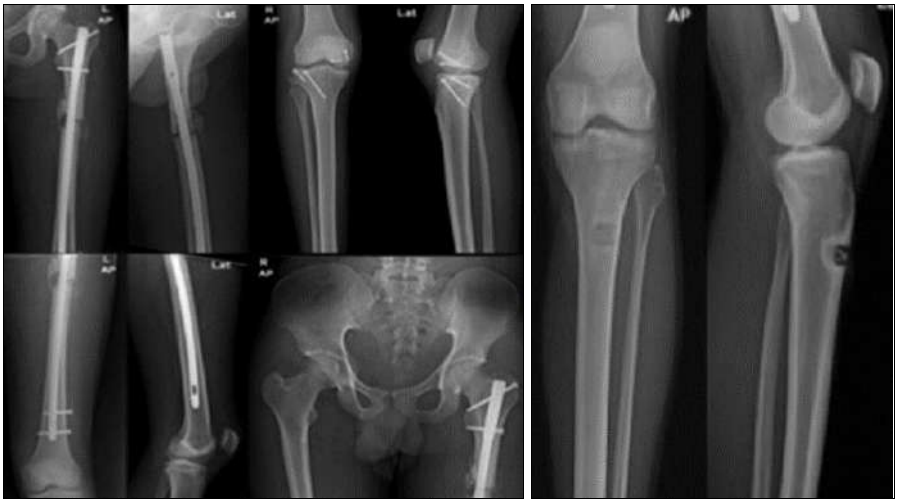

Fig 2: Pre op clinical presentation, intra op findings of infected granulation tissue with sequestrum and post op histopathological slides with X-ray

Discussion

In Modern orthopaedics with latest surgical techniques role of skeletal traction has become meagre, it is specially indicated temporarily in fractures of pelvis, acetabulum, and proximal part of the femur that cannot be adequately immobilized with splint application alone [1]. Also it has been used temporarily to treat specific fractures like tibial plateau, tibial plafond, subtalar fractures and certain acetabular fractures. Long-term skeletal traction is indicated in medically unfit and limited resources patients [2].

Application of Skeletal traction should be done meticulously in sterile conditions and within safe zones utilizing anatomical landmarks as described [3]. Improper aseptic technique, thermal necrosis, prolonged duration; poor tract care and comorbid conditions can lead to complications like skin discharge, pin loosening, septic arthritis, and osteomyelitis [4]. Poor general condition, improper hygiene, decreased immunity as in our case a polytrauma patient with poor nutritional intake prolonged hospitalization and travel history from one country to another can cause or aggravate infections.

Minor pin infections subside with proper wound care, antibiotic, removal of pins after fracture union. Very few cases sequel to chronic pin tract osteomyelitis presenting as chronic discharging sinus seen radiologically as ring sequestrum, a narrow radiolucent halo surrounded by dense sclerosis with a sequestrum in it [5]. Staphylococcus organisms are the commonest cause of short-term pin osteomyelitis, however gram negative organisms can be isolated in long term pin use [6]. Our case did not yield any organisms on short period of culture.

Chronic osteomyelitis with avascular sequestra warrants thorough surgical debridement removal of sequestra, infected tissue and saucerisation to avoid recurrence [7, 8]. Also required are appropriate antibiotics, dead space management and soft tissue cover if required [7, 8]. In our case we were able to get good skin cover and complete eradication of infection by surgical intervention.

Conclusion

Ring sequestrum is a rare complication in modren day orthopaedics. Skeletal pins should be applied with due diligence respecting soft tissue, sterile conditions, avoid

thermal necrosis and within safe zones. Maintainance of good immunity particularly in polytrauma situation with proper pin care and timely removal of pin can avoid this complication. Treatment of ring sequestrum is mostly surgical with meticulous debridement, soft tissue cover and relevant antibiotics.

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Statement of Ethics; Ethical approval was obtained from Institutional Ethical committee and the patient and his father have given their written Informed consent to publish their images and case, obtained in local language.

Conflict of Interest: Nil

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Author Contributions; All authors have contributed in assessing and following up the case. Everyone has thoroughly read the article and equally contributed in completing the manuscript.

References

1. Browner B, Jupiter J, Krettek C. Skeletal trauma: basic science, management, and reconstruction. 5th ed. Philadelphia: Elsevier Sanders, 2015, 1565-2387.
2. Magu NK, Rohilla R, Arora S. Conservatively treated acetabular fractures: a retrospective analysis. Indian J Orthop. 2012; 46(1):36-45. Doi:10.4103/0019-5413.91633.
3. DeFroda SF, Gil JA, Born CT. Indications and anatomic landmarks for the application of lower extremity traction: a review. Eur J Trauma Emerg Surg. Epub. 2016; 42(6):695-700.
4. Austin DC, Donegan D, Mehta S. Low complication rates associated with the application of lower extremity traction pins. J Orthop Trauma. 2015; 29(8):e259-65.
5. Nguyen VD, London J, Cone RO. Ring sequestrum: radiographic characteristics of skeletal fixation pin-tract osteomyelitis. Radiology. 1986; 158:129-31.
6. Green SA, Ripley MJ. Chronic osteomyelitis in pin-tracts. J Bone Joint Surg. 1984; 66:1092-8.
7. Brad Parsons, Elton Strauss. Surgical management of chronic osteomyelitis. The American Journal of Surgery 188 (Suppl to July 2004) 57S-66S.
8. Vaishya, Raju, Abhishek Vaish. Ring sequestrum of the tibia. BMJ case reports, bcr2013201837, 2014, Doi: 10.1136/bcr-2013-201837.