



Physiotherapy Rehabilitation in Idiopathic Chronic Osteomyelitis: A Case Report

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Osteomyelitis is an infection-related inflammation of the bones and bone marrow. Generally in the legs, arms, spine. Foot and ankle osteomyelitis can be excruciatingly painful for patients and a difficult management challenge for orthopedic surgeons. Acute staphylococcal osteomyelitis had a 50% death rate in the pre-antibiotic era. Osteomyelitis of the foot and ankle can occur due to a variety of reasons, with diabetic foot infections being one of the most common. Osteomyelitis is a bone marrow inflammation which progression, involving the cortical plates and frequently periosteal tissues, along with the majority of cases occurring after bone trauma or surgery, or as a result of vascular insufficiency. Chronic nonbacterial osteomyelitis is an autoinflammatory disease that primarily affects children and adolescents and is characterized by recurrent or persistent osteitic foci. The symptom is bone pain, which may or may not be accompanied by soft tissue tenderness. Chronic osteomyelitis is related with avascular necrosis of bone along with the establishment or formation of sequestrum (dead bone), and surgical debridement, in addition to antibiotic therapy, is required for cure. Physiotherapy has effect in improving the quality of life of the patient with osteomyelitis.

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1. INTRODUCTION

The infection of bone is called as osteomyelitis. Osteomyelitis is known as an infection of the bone. It includes hematogenous osteomyelitis, vertebral osteomyelitis, osteomyelitis after trauma, and diabetic foot infection are several major syndromes commonly seen in this condition. There are no of systemic infectious diseases that may spread from bone to the bone such as enteric fever, actinomycosis, mycetoma, syphilis, tuberculosis. There are two types of osteomyelitis are pyogenic and tuberculous. There are many etiologic agents that may cause Osteomyelitis [1]. *Staphylococcus aureus* less frequently other organisms involved are *E.coli*, *pseudomonas*.

Fever, malaise and leukocytosis generally are related to bony lesions radiologic examination confirms bony destruction. Persistence neglect and chronicity of OM Over time, this can lead to the development of amyloidosis. Some morphological features are Pathological changes in any state of osteomyelitis include suppuration, ischaemic necrosis healing by fibrosis, and bony repair [2].

The sequence of pathologic changes is as under:

1. The infections begins in the metaphyseal end of the marrow cavity which is largely occupied with pus. At this stage microscopy reveals congestion, edema, and exudate of neutrophils.
2. The tension in the marrow cavity is increased with pus and result in infection along marrow cavity the marrow cavity, into endosteum into haversian and volkmanns canal causing Periosteitis.
3. The infection may reach subperiosteal space forming subperiosteal abscesses.
4. The combination of suppuration and impaired blood supply to cortical bone result in erosion, thinning, infarction necrosis of the cortex called Sequestrum

Because of the lengthy treatment process, osteomyelitis is a difficult diagnosis for every patient. To properly diagnose and treat this bacteria-related severe disorder, highly experienced orthopaedic surgeons are required [3,4]. Chronic osteomyelitis with proliferative

periostitis is a rare type of osteomyelitis marked by new bone formation and periosteal reaction. Garre's osteomyelitis is another name for it.

Management of Osteomyelitis is a multidisciplinary approach. Skin grafting is the oldest fundamental procedures in the field of plastic and reconstructive surgery. Most widely and commonly used method is Tie-over dressing. It secures the skin graft to its recipient bed, reduce the size of dead space, and prevent hematoma formation under the graft. Other Treatment options include medications, antibiotics bone grafting depending upon the extent of infection. Physiotherapy plays a role in avoiding secondary complications as well as improving the quality of life of the patient.

2. PATIENT INFORMATION

In this case we found a female patient of 38 years complaining of pain and swelling over right foot 10 years back. Pain was sudden in onset and gradually increasing in nature. Patient noticed swelling which was lemon shaped 10years back which gradually increased in size over time. patient went to private hospital where she was managed with operative procedures 10yrs back[no documentation present]..

Patient went to private hospital for primary management and came to AVBRH for further management.

Chart 1. Clinical Events

Events	Date
Complaints of pain and swelling	10/05/2021
Visited AVBRH with same complaints	11/05/2021
Diagnosed with osteomyelitis	14/05/2021
Underwent surgery	15/05/2021
Started physiotherapy	19/05/2021

2.1 On Inspection

The patient was conscious and well oriented. Prior consent was taken from patient before the physical examination. The patient was examined in supine position on inspection swelling was present, patient's hip was externally rotated.

2.2 On Palpation

Grade II tenderness at the ankle, mild warmth present .Pain at rest on NPRS was 5/10.All ankle range of motion is reduced.

2.3 Physical Examination

The patient was made comfortable, the pulse was 86 beats/min. the respiratory rate was 18 breaths / min. The blood pressure was 130/80 mm of hg. There was no loss of appetite and no marked weight loss. On examination there was no change in limb length measurement, both the limbs were bilaterally symmetrical.

Range of motion: the range of motion of upper limb at all the joints; shoulder, elbow, wrist and hand, and fingers were normal [complete and painless]. The range of motion of lower limb is elicited in Table 1.

Pain: there was no pain in the upper limb. There was marked pain in lower limb at right ankle. The pain was increasing gradually and was insidious.

Table 1. The range of motion of lower limb

Joint	Movement	Left	Right
Hip	Flexion	0-130	0-110
	Extension	0-30	0-30
Knee	Flexion	0-120	0-120
	Extension	0-120	0-120
Ankle	Plantarflexion	0-40	0-15
	Dorsiflexion	0-20	0-10

Tightness: soft tissue tightness was not found in upper limb. There was soft tissue tightness in lower limb in right side. Stiffness in the muscle restricted the range of motion and patient was not able to do daily activities due to pain.

2.4 Investigation

Xray was done which revealed reduction in joint space at all ankle joint,sclerotic margins in all the ankle bones ,abnormal bone growth was seen at the base of first metatarsal.

As shown in the figure (Fig. 1 and Fig. 2)



Fig. 1. Presentation of the Ankle



Fig. 2. Shows anterior and lateral View of X-ray



Fig. 3. Anterior view of X-Ray

Table 2. Clinical Investigations

Investigations	Dosage	Rationale
Range of motion	10 repetition 3 times daily	To maintain tissue extensibility and avoid formation of adhesions.
Ankle joint isometrics	5 seconds hold 10 times, thrice daily	To maintain and improve strength of the musculature
Ambulation with walker	3 times daily	To maintain lung compliance and maintain cardiovascular endurance
Breathing exercise	10 repetition every 2 hourly	To maintain lung compliance and avoid accumulation of secretions
Stretching exercise	3 reps 30 second hold	To maintain tissue extensibility

2.5 Management

Patient education regarding the condition and the importance of exercise was explained to the patient, safe mobilization using walker was taught to the patient. These Exercises were followed for a duration of 8 weeks and home exercises were advised. Weekly monitoring was done for the patient and the protocol repetition and duration was changed depending upon the patient’s condition.

2.6 Outcome Measures

Table 3. Post Treatment- Range of motion

Joint	Movement	Left	Right
Hip	Flexion	0-130	0-110
	Extension	0-30	0-30
Knee	Flexion	0-120	0-120
	Extension	0-120	0-120
Ankle	Plantarflexion	0-40	0-40
	Dorsiflexion	0-20	0-15

Numeric Pain Rating Scale – Pre 5/10
Post 2/10

3. DISCUSSION

In this Case report we are discussing a case with chronic osteomyelitis and the physiotherapy

rehabilitation in it. Dikopova NZ et, al. conducted a study on the effect of physiotherapy intervention alveolitis which shows significant reduction in the duration of the rehabilitation period in the patient [5]. Ana Lucia L. Lima et, al. Conduced a study for treatment recommendations for treatment in osteomyelitis which revealed that a multidisciplinary antimicrobial treatment, role of hyperbaric oxygen as adjuvant therapy [6,7]. Thierry Rod-Fleury et al. Conducted a study which revealed that Six weeks of IV treatment beyond six weeks did not shown remission incidence [8].

The movement in ankle joint is a complex movement as it involves subtalar joint, inferior tibiofibular joint and tibiotalar joint. The mobility in ankle was maintained along with peripheral circulation [9]. As, the patient developed osteomyelitis the patient again underwent a revision surgery, Osteomyelitis is a common complication of road traffic accidents. The diagnosis frequently is delayed because of its rarity and variable presentation, which may be acute with systemic signs or insidious with mild local signs. The diagnosis should be considered in patients with persistent peripatellar pain and swelling, cellulitis, septic prepatellar bursitis, and septic arthritis of the knee that does not respond

to standard treatment. Treatment is identical to the treatment of osteomyelitis at other locations.

4. CONCLUSION

In cases of osteomyelitis physiotherapy intervention plays a crucial role to maintain and improve range of motion, strength and prevent deconditioning of cardiovascular and pulmonary system.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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