

CHRONIC OSTEOMYELITIS IN IBADAN

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INTRODUCTION

Chronic osteomyelitis¹ refers to infection of the bone that extends beyond six to eight weeks. The term 'osteo' means bone and 'myelo' means the marrow cavity, both of which are involved in this disease.

CO can arise primarily *denovo* or following acute osteomyelitis in which treatment has been delayed or is inadequate, and this is common among patients with sickle cell anaemia.

Secondary chronic osteomyelitis can arise as a complication of open fractures, arthroplasties or following bone injuries². CO can persist for years.

The hallmark feature of CO is the presence of infected dead bone, called sequestrum that has separated from living bone. The involucrum is a sheath of new bone which forms around the dead bone. There may be a cloaca which is a sinus through which pus discharges, burrowing through the soft tissues to the skin⁶.

There is no medical management of CO³ and treatment is primarily surgical and involves the complete debridement of all devitalised bone and soft tissues regardless of the size of the wound⁴.

CASAUTIVE AGENTS

Staphylococcus aureus has been implicated as the infecting organism in most cases worldwide.

In a study done on 14 patients with CO between September 1995 and March 1997 (Alonge et al) in UCH, Ibadan, 9 out of 14 had *Staphylococcus aureus* as the microbial isolate; 1 had *S. albus*, 1 had *Proteus* spp and 1 had a mixture of *Pseudomonas aeruginosa* and *S. albus*⁸.

In another study on 'microbial isolates' (Alonge et al), it was discovered that *S. aureus* was the predominant causative agent with about 60% prevalence. What is important however is that the sensitivity pattern is changing and it is therefore essential to carry out culture and sensitivity test on the swabs or bone biopsies on all patients with CO so as to know the appropriate antibiotics to use since a lot of resistant strains of microbes have developed.

PATIENTS (MATERIALS) AND METHODS

This study was carried out on data collected from the period April 1996 to January 1997.

A total of 1,402 new patients were seen at the orthopaedic unit of the surgical outpatient department of the University College Hospital (UCH), Ibadan.

75 of these patients had chronic osteomyelitis. Table 1 shows the cases seen and their prevalence.

Table 1

Case /Disease	Number of Patients
Osteoarthritis	102
Fracture	322
Chronic Osteomyelitis	75
Back pain	29
Lumbar Spondylosis	63
Bilateral Genu Vara	30
Unilateral Genu Valgum	20
Dislocations	47
Rickets	22
Non-Union of Bone	18
Malunion	26
Cervical Spondylosis	25
Avascular Necrosis	36
Secondaries to Bone	4
De quervain Tenosynovitis	25
Acute Osteomyelitis	17
Others	263

The bones that were affected by CO are shown in in tabel 2.

Table 2

Bones Affected	No of Cases Seen
Humerus	11
Clavicle	1
Ulnar	1
Femur	19
Femur & Tibia (opposite sides)	3
Tibia & Fibula	1
Humerus & Tibia (opposite sides)	1
Fibula	2
Ankle	1
Ischial	1
Innominate	1
Metatarsal	1
Ilium	1
Unspecified	10
Total	75

(The femur was the bone affected the most)

Of these 4 cases were secondary CO due to open fractures, post operative bone infection (ORIF), RTA. 2 of the cases with primary CO suffered from sickle cell anaemia.

EVALUATION OF PATIENT

This involves a thorough history and physical examination of the patient, with emphasis on anaemia, hypogammaglobulinaemia, malnutrition or debilitating illnesses which are all predisposing factors. CO is also a common complication of sickle-cell anaemia.

Wound swabs for microscopy, culture and sensitivity, a full blood count, Hb genotype, ESR, electrolyte and urea are also carried out as need be³.

There should also be a core biospy of the deep bone using a biopsy needle and this is more reliable than a wound

swab for m/c/s.

Characteristic features on x-ray include

- Loss of corticomedullary differentiation
- Irregular bone expansion
- Bone-in-bone appearance
- Spaces called **lacunae** filled with pus.

An x-ray of the affected bone can be used to identify the infected site. Bone scans and sinograms may delineate the abscess cavity. A bone scan used in conjunction with a bone biopsy can give a definitive diagnosis.

In summary, a proper pre-op evaluation, surgical philosophy, soft tissue assessment, bone consideration and dead space management are all involved in adequate treatment of CO⁵.

RESULTS

75 patients had CO out of 1,402 patients seen (5.34%). Thus 5 of every 100 new cases seen presented with chronic osteomyelitis. Of the 75 patients, 45 were males and 30 were females giving a ratio of 1.5:1 (i.e 60% of the patients were males and 40% were females). Table 3 shows the age of the patients

Table 3

Age range	No of Patients
1-10	11
11-20	24
21-30	17
31-40	8
41-50	10
51-60	4
61-70	1

The commonest age range was 11-20 years.

From ages 11 to 50, a total of 59 patients presented (79%). Ages 11-50 represents the productive age group and thus 79% of the labour force may be affected with CO thus reducing their input to the economy of the nation.

DISCUSSION

TREATMENT OF CO

This debilitating disease that is fairly common in our environment and affects commonly the workforce can only be managed surgically. Various operative techniques have been adopted in the management of the disease and they include:-

- i) Saucerization and curettage
- ii) Papineau technique
- iii) Continuous wound irrigation with antibiotics
- iv) Bone resection and callotaxis
- v) Bone resection and allograft
- vi) Two stage belfast procedure

The belfast procedure is currently the technique of choice for management of patients in UCH, Ibadan (Alonge et al).

Saucerization And Curettage

Involves removal of the sequestrum and the greater part of the thick avascular sclerotic wall of the abscess together with thorough curettage of granulation tissue. The procedure results in the formation of a saucerised cavity which can be safely filled with cancellous bone subsequently.

Continuous Wound Irrigation with Antibiotics

Involves the use of a closed suction drainage and the continuous irrigation of the wound locally with the appropriate antibiotics.

Belfast Procedure

- A two stage procedure.
- The 1st stage involves the excision of all dead bone and infected/edematous soft tissue. The osteomyelitic cavity is curetted and thoroughly lavaged with copious amount of normal saline. The antibiotic beads are then laid in the gutter (bone defect) created.

An important modification of the procedure here in Ibadan was the institution of pentamycin beads (Septopal) with ceftriaxone polymethylmethacrylate beads at the saucerised segment of bone. The ceftriaxone - PMMA beads are locally produced and have been found to be as efficient as the commercially available gentamycin beads. Another important outcome was a four-fold saving in cost in choosing to use cef-PMMA beads (Alonge et al 1999).

The second stage which is undertaken six to eight weeks after the first stage involves the removal of the antibiotic beads and bone grafting of the defect if necessary.

Complications of CO

Chronic osteomyelitis, though far less frequent, remains a cause of invalidism in children and a problem for surgeons⁷.

In adults the complications vary and include

- An acute exacerbation of the infection which could lead to septicaemia.
- There could be infection of implants and this could spread to other implants presented elsewhere in the body.
- Amyloidosis - this occurs only when copious discharge of pus has for persisted for some years.
- Malignant change (usually squamous cell carcinoma) can occur with the sinuses and are usually from metaplasia of the epithelium lining the sinuses. These malignancies can cause a change in the amount or odour of the drainage, a friable vascular enlarging mass and bone destruction.

Treatment of these carcinoma often requires amputation.

- Pathological features which can occur before or after surgery.
- Defined limb which can arise from the diseased bone

DISCUSSION

In an ideal world in which prompt diagnosis was followed by effective surgery and potent antibiotics, chronic pyogenic osteomyelitis would disappear, but we are at present far from this happy state⁷.

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