Chronic Osteomyelitis of Jaw

Dr. Dhawal Goyal, [1] Dr. Nilima Malik, [2] Dr. Neha Gupta, [3] Dr. Manoj Agarwal, [4] Dr. Rajani Kalla, [5] Dr. Sanyam Agarwal [6]

1. **Dr. Dhawal Goyal**
   MDS, Oral Private Practitioner
2. **Dr. Nilima Malik**
   MDS Oral and Maxillofacial Surgery
3. **Dr. Neha Gupta**
   Assistant Professor, Dept. of Prosthodontics, RUHS College of Dental Sciences, Jaipur
4. **Dr. Manoj Agarwal**
   Assistant Professor, Dept. of Conservative Dentistry & Endodontics, RUHS College of Dental Sciences, Jaipur
5. **Dr. Rajani Kalla**
   Assistant Professor, Dept. of Prosthodontics, RUHS College of Dental Sciences, Jaipur
6. **Dr. Sanyam Agarwal**
   Medical Officer, Dept. of Conservative Dentistry & Endodontics, RUHS College of Dental Sciences, Jaipur

The prevalence of osteomyelitis of jaws in third world country is still at a higher rate despite newer and powerful antibiotics and advances in dental care. This may be due to low socio-economical status, unavailability of primary health care services, and poor nutritional status in the rural areas.

Osteomyelitis may be defined as an inflammatory condition of the bone that usually begins as an infection of the medullary cavity, rapidly involves the Haversian system and quickly extends to periosteum of the affected area. The infection then becomes established in the cortical portion of the bone, creating ischemia and eventually causing necrosis of bone. Osteomyelitis of jaws develops after a chronic odontogenic infection or a variety of other reasons like tuberculosis or fungal infection. An underlying alteration in host defence is present in majority of patients with osteomyelitis of jaws. Osteomyelitis has been noted in patients with diabetes, autoimmune disease, agranulocytosis, leukaemia, severe anaemia, malnutrition, syphilis, cancer chemotherapy, steroid drug use, sickle cell disease, acquired immunodeficiency syndrome[1] and with the habit of tobacco and alcohol consumption.[2]

Cultures, bone biopsy, conventional radiography, scintigraphy, CT scan are used to diagnose chronic osteomyelitis of jaws. Computed Tomograph helps in determination of cortex and medullary involvement of diseased bone better as compared to conventional radiograph.

Therapy for osteomyelitis of jaws requires a multidisciplinary approach. A precise microbiologic diagnosis and adequate debridement of necrotic tissue are essential. Acute hematogenous osteomyelitis usually responds to antimicrobial therapy.

However, chronic osteomyelitis of jaws usually requires surgical debridement. Surgical exploration and sequestrectomy & saucerization are most frequently used to treat these cases. Radical surgery such as decorticotomy or resection is effective in the treatment of extensive cases of chronic osteomyelitis of the jaws. Hyperbaric oxygen is often recommended as an adjuvant in treatment of chronic osteomyelitis of jaws.

In present study, we have analyzed the etiological factors, age and sex prediction, site of occurence, role of CT scan and various treatment modalities followed in our institute over a period of 3 yrs.

Aims and Objectives of our study are-

1. To study the various etiological factors of chronic osteomyelitis.
2. To study the role of systemic conditions as a predisposing factors in chronic osteomyelitis of jaw.
3. To discuss various treatment modalities (surgical & nonsurgical) for management of chronic osteomyelitis of jaws.

Topazian (2002) has classified osteomyelitis as:

A. Suppurative osteomyelitis

1. Acute suppurative osteomyelitis
2. Chronic suppurative osteomyelitis:

(a) Primary- no acute phase preceding

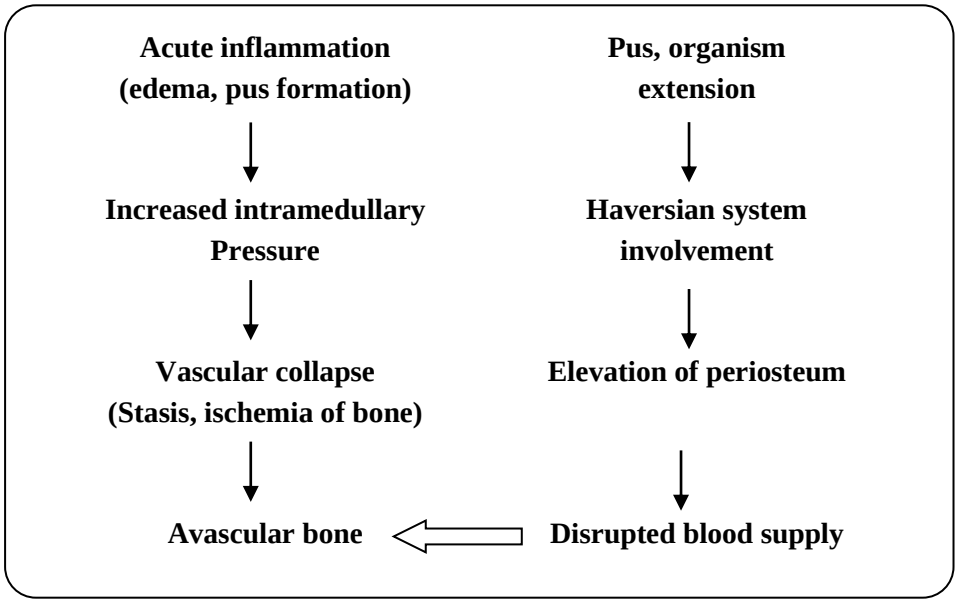
(b) Secondary –follows acute phase

3. Infantile osteomyelitis.

B. Non Suppurative Osteomyelitis

1. Diffuse sclerosing osteomyelitis
2. Focal sclerosing osteomyelitis (condensing osteitis)
3. Proliferative periostitis (Garre's sclerosing osteomyelitis, periostitis ossificans)
4. Osteoradionecrosis

Osteomyelitis of maxilla is less frequent than mandible because maxillary blood supply is more extensive. Thin cortical plate and a relative paucity of medullary tissues in the maxilla preclude confinement of infections within bone and permit the dissipation of oedema and pus into soft tissue and paranasal sinuses.



In Tuberculous osteomyelitis of the maxilla or mandible there are 3 possible methods of inoculation of bacteria into the bone,

1. Direct inoculation of bacilli into the oral mucosa through an ulcer or a breach in continuity of the mucosa or through periodontal membrane.
2. Spread to the bone through an extraction socket or an infected fracture line.
3. Hematogenous spreads from primary focus elsewhere in the body. This primary focus may be active or quiescent, apparent or latent either in the lungs or in the lymph glands of the mediastenum, mesentery, and cervical region or in the kidney or in other viscera.

MANAGEMENT

Management of osteomyelitis of jaws depends on -

- Etiology of the disease
- Predisposing factors like altered immune status of host, vascularity of bone etc.
- Site and extent of the lesion.

Osteomyelitis of jaws usually requires medical and surgical treatment, although occasionally antibiotic therapy alone is successful.

Chronic osteomyelitis of jaw bones can be managed by

1. Medical management
2. Surgical management

MEDICAL MANAGEMENT: It includes-

- Adequate fluid and dietary intake

- Evaluation and correction of host immune system deficiencies
- Systemic Antibiotic therapy
- Anti tubercular therapy-Whenever required
- Antifungal therapy- Whenever required
- Hyperbaric oxygen therapy

SURGICAL MANAGEMENT: It includes

- Local antibiotic therapy- Closed wound irrigation-suction & Antibiotic impregnated beads
- Sequestrectomy and Saucerization
- Decortication
- Resection and Reconstruction

RESULTS

The study was conducted in the department of Oral and Maxillofacial surgery, Nair Hospital Dental College, Mumbai. 40 patients were examined. 32 patients out of 40 were suffering from osteomyelitis due to odontogenic cause. Three patients had etiologic factor as fungal infection, whereas 4 patients had tuberculous osteomyelitis of jaw. One patient had primary chronic osteomyelitis of mandible and etiology was unknown.

In our study

- Mandible was more commonly affected as compared to maxilla. Both bones had predilection for right side more as compared to left side
- Patients having systemic disorders required more time for recovery as compared to patients who did not have any systemic disorders
- Surgical method used primarily for osteomyelitis was sequestrectomy and saucerization. It was carried out in 19 patients and curettage was carried out in only 16 patients. Decortication was carried out in 4 patients and one patient underwent resection followed by reconstruction.
- CT scans of 20 patients were evaluated. The CT scan pattern showed was classified into 4 categories; sclerotic, lytic, mixed and sequestrum. The most common pattern seen was mixed pattern. 9 patients had mixed CT scan pattern and 5 patients had lytic pattern and 3 patients each showed sclerosis and sequestrum pattern.
- Osteomyelitis is more common in mandible due to odontogenic infection as compared to maxilla, whereas fungal osteomyelitis was more common in maxilla (which confirms its route of transmission ie. Inhalation) as compared to mandible. Tuberculous osteomyelitis was seen only in mandible. One case of diffuse sclerosing osteomyelitis or primary chronic osteomyelitis was seen in the mandible.
- Retrospective correlation between CT scan finding and surgical intervention was carried out. It was suggestive that patients whose CT scan showed sclerosis pattern, they underwent decortication and patients with mixed pattern CT scan underwent curettage. One resection was carried out in mixed pattern patient.

CASE REPORT

A 55 years old female patient reported to Maxillofacial Dept., Nair Hospital Dental College with the chief complaint of discharge of pus from right infraorbital region and discharge of pus intraorally since 8 months.

There was h/o extraction of upper molar tooth on right side, later patient noticed extraoral discharging sinus in right infraobital region and discharge of pus intraorally in right upper buccal vestibule. She had consulted to family doctor for the same and taken treatment for 3 months but there was no improvement in symptoms. Then patient was referred to Nair Hospital Dental College for definite management.

Patient gave past history of diabetes since 6 years and was on Inj. Human insulin 10 units before breakfast, 8 units before dinner subcutaneously. She gave H/O hypertension and was taking Tab. Amlodipine 5 mg in morning. There was no other significant past medical history. Patient was a home maker.

Patient’s general condition was fair. Vital parameters were brought within normal limits. Face was asymmetrical. One extraoral discharging sinus was seen in right infraorbital region. On intra oral examination, necrotic maxilla could be appreciated extending from right tuberosity and crossing midline till 25. Grade II mobile teeth 11,12,13,21,22,23,24, 25 were noted. Mouth

opening was adequate. Patient`s oral hygiene was very poor.

OPG showed various grades of radiolucency and radio-opacity with a large sequestrum extending from right tuberosity and crossing midline till 25. Opacification was noted in right maxillary sinus.

CT scan showed the area of erosion and cortical discontinuity with destruction of antero-lateral and postero-lateral wall of right maxillary sinus. Necrosis of alveolar bone was seen extending from right tuberosity crossing midline up to left side premolar.

Bone scintigraphy showed increased radiotracer 99mTc-MDP uptake in right and left maxilla. No similar lesion was found in other bones of body.

Diagnosis was made as chronic suppurative osteomyelitis of right maxilla. Patient was started on Tab. Doxy 100 mg OD and meantime patient was worked up for general anesthesia and blood sugar and blood pressure were brought within normal limit. Pus for culture and antibiotic sensitivity test was repeatedly sent but there was no organism seen. Mantoux test and sputum for AFB were negative.

Finally patient was posted for surgery under general anesthesia and large sequestrum of maxilla was removed via Weber-Fergusson approach. Thorough curettage of the defect was done. Extra oral sinus tract present in infra- orbital region was removed with help of 11 no. blade. Granulation tissue and necrosed bone were sent for biopsy and culture and sensitivity test.

Patient was started on Inj. Ampiclox and Inj. Gentamicin. Report of pus for culture and sensitivity test was suggestive of fungal infection. On KOH smear filamentous fungi were seen. Growth on Saburaund media was suggestive of Aspergillus. Amphotericin –B was started on day (1) 25mg, day (2) 37.5mg then 50mg/day till 3 weeks followed by oral fluconazole for 6 weeks. The dose of Amphotericin –B varies from 0.5mg/kg to 1.5 mg/kg according to severity of infection. Amphotericin –B was available as dry powder which was supposed to be mixed with 200 ml of normal saline and infused over 2 to 3 hrs.

Special attention was maintain hydration of patient. 200 ml of normal saline was rapidly infused before slow infusion of Amphotericin –B and once Amphotericin –B infusion was over, again 200 ml of normal saline was flushed rapidly.

Patients input and output chart was maintained to monitor renal function and after infusion patients serum electrolytes were checked. After every 3rd day renal function tests were assessed. Inj. Avil 25mg and Inj. Paracetamol 300mg were given before infusion to prevent the episode of fever and chills which could occur during infusion. To prevent photosensitivity reaction to the drug I.V. set and infusion bottle were covered with yellow paper.

Wound responded well to surgical intervention which was followed by

Inj. Amphotericin - B therapy.

CONCLUSION

The clinician should consider patient’s immune compromised status and treat any compromising condition and the condition that alter the vascularity of bone and predispose the patient to the onset of osteomyelitis of jaws, concomitantly with the orofacial infection. With the increased number of immunocompromised patients seeking health care services, one might as a direct consequence expect the incidence of osteomyelitis to increase.

Almost all the avenues and pathways have been explored, but still a lot has to be learnt. It is true that the dread of morbidity and mortality due to osteomyelitis has been conquered, but we still can not boast of a positive and accurate approach to the multitude of problems presented by chronic osteomyelitis of jaws.

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