

# Chronic suppurative osteomyelitis of the maxilla and zygomatic bone: a treatment challenge and the importance of early surgical exploration.

SADJ October 2016, Vol 71 no 9 p412 - p414

CJ Perumal,<sup>1</sup> AS Singh,<sup>2</sup> K Rajkumar<sup>3</sup>

## ABSTRACT

Osteomyelitis of the maxilla rarely occurs.<sup>1</sup> Treating this condition presents a challenge to the Oral and Maxillofacial surgeon as a result of the diverse clinical and radiographic presentations which influence the choice of the treatment modalities. This case report highlights the importance of early surgical exploration in patients with chronic suppurative osteomyelitis of the maxillary and zygomatic bones that has remained refractory to prolonged antibiotic treatment.

**Key words:** chronic, suppurative, maxilla, exploration, osteomyelitis

## INTRODUCTION

Osteomyelitis may be defined as an acute or chronic inflammatory process in the medullary spaces or cortical surfaces of bone.<sup>2</sup> It begins as an infection of the medullary cavity, involving the Haversian systems and subsequently extends to involve the overlying periosteum of the affected bone. Bone destruction with sequestration is a characteristic feature of the disease.<sup>3</sup> Osteomyelitis can occur due to infections from bacterial, viral or fungal micro-organisms, which may arise from a root canal, periodontal ligament, fracture site, soft tissue wound or surgical site, such as an extraction socket.<sup>4</sup> Serious complications may ensue, such as cerebral abscesses, encephalitis and meningitis.<sup>3,4,5</sup>

## ACRONYMS

<b>BIPP:</b>	bismuth iodoform paraffin paste
<b>CT:</b>	computed tomography
<b>FCOD:</b>	florid cemento-osseous dysplasia

Hudson classified osteomyelitis into acute and chronic forms, based on the disease having a clinical duration of more than one month.<sup>6</sup> Peterson classified acute osteomyelitis into three types, one with a contiguous focus, another of the progressive type and one of the haematogenous type. He classified chronic osteomyelitis as being recurrent multifocal Garre's, suppurative or non-suppurative and sclerosing.<sup>2</sup>

Treatment of this condition with appropriate antibiotics early in its course may result in complete resolution of the infection.<sup>7</sup> However, allowing the infection to progress without adequate treatment over a prolonged period may result in the need for repeated surgical debridement and antibiotic treatment. Suppurative osteomyelitis can involve the periosteum, cortex

1. **Colin J Perumal:** BDS. Division of Maxillofacial and Oral Surgery, Grey's Hospital, Pietermaritzburg, KwaZulu-Natal, South Africa.
2. **Avin S Singh:** BDS, MDent (MFOS), MSc, MDS. Head, Division of Maxillofacial and Oral Surgery, Grey's Hospital, Pietermaritzburg, KwaZulu-Natal, South Africa.
3. **Kavir Rajkumar:** BChD, Dip Odont (Oral Surgery). Division of Maxillofacial and Oral Surgery, Grey's Hospital, Pietermaritzburg, KwaZulu-Natal, South Africa.

### Corresponding author

**Colin J Perumal:**  
Division of Maxillofacial and Oral Surgery, Grey's Hospital, Pietermaritzburg, KwaZulu-Natal, South Africa. E-mail: colmax@tiscali.co.za



Figure 1: Pre-operative view of cutaneous fistulae.

or bone marrow. In an established case, the symptoms may include deep bone pain, induration, swelling with erythema of the overlying soft tissue, malaise, fever, adenopathy, paresthesia in the distribution of the sensory nerves, trismus, anorexia and discharging sinuses.<sup>2,8</sup> Within 10-14 days after the onset of osteomyelitis, teeth in the involved area may become mobile and sensitive to percussion. Pus may exude around the gingival sulcus or through mucosal and cutaneous fistulae.<sup>8</sup>

Maxillary osteomyelitis occurs infrequently compared with mandibular osteomyelitis.<sup>1</sup> This may be due to the rich vascularity and thinner cortices of the maxilla, which promote rapid healing. There are also more possibilities for collateral blood supply than exist in the mandible. These characteristics of the maxilla allow adequate drainage of oedematous fluid and pus into the soft tissues and paranasal sinuses, reducing the chances of festering infection within the bone. However, when an infection does not respond to regular treatment methods, it is essential that the problem is recognised early and is treated aggressively by the surgeon to avoid life threatening complications.<sup>5</sup>

The treatment objectives in these circumstances are to remove dead bone and eliminate or diminish the presence of the causative micro-organisms by using a combination of surgery, antibiotics and supportive care.<sup>9</sup> Surgical options may include either open surgical exploration or endoscopic exploration and then debridement.<sup>10</sup>

This paper discusses a rare case of chronic suppurative osteomyelitis of the right zygomatic bone which presented with persistent discharging sinuses in the regions of the right cheek and lateral border of the right orbit.

## CASE REPORT

A 55 year old female with a medical history of hypertension and type II diabetes was referred to the Maxillofacial and Oral Surgery Clinic, Grey's Hospital, South Africa. The patient presented with a right unilateral facial swelling with pus discharging through three cutaneous fistulae in the right zygomatic-orbital region, the lesion being of three years duration (Figure 1). The patient had undergone a maxillary sequestrectomy performed three years ago by the Department of Otolaryngology. This was done in an attempt to treat her chronic suppurative sinusitis, which had eroded her maxillary sinus walls and hard palate (Figures 2 & 3). She had received several doses of antibiotics including a Penicillin derivative such as Amoxicillin combined with Clavulanate, an Imidazole such as Fluconazole, a Tetracycline such as Doxycycline and a Nitroimidazole such as Metronidazole on separate occasions spanning the three year period.

The records of the patient did not reveal whether investigations for microbial culture and sensitivity were done. It was therefore presumed that antibiotics were administered empirically. The discharging sinuses had not resolved with the antibiotic treatment. Several computed tomography (CT) views, recorded at the time of attendance at the MFOS Clinic, confirmed the presence of a circumscribed mixed radiopaque/radioluscent lesion, 1.4 cms in diameter, within the body of the zygomatic bone extending from the region of the right lateral orbital wall to the infero-lateral orbital margin. The lesion contained a hypodense cortex with multiple air loculi within and around it, an appearance in keeping with the features of a sequestrum (Figure 4). A provisional diagnosis of chronic suppurative osteomyelitis was made.

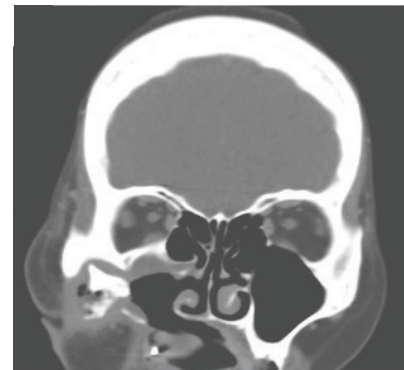
A culture swab of the inflammatory exudate demonstrated colonies of Actinomyces. The treatment plan involved surgical and medical management. The patient was surgically explored under general anaesthesia. An incision was made along the pre-existent scars in the right infraorbital region along the fistula and in the region of the zygomatic buttress. This approach was used with a view to accomplishing a simultaneous scar revision. The sequestrum as well as the associated granulation tissue were removed. The cavity was burred down until healthy bone was found (Figure 5). The revised scar was approximated using resorbable sutures subcutaneously, and non-resorbable sutures were inserted on the skin. Gauze soaked in bismuth iodoform paraffin paste (BIPP) was placed into the defect intraorally and then removed after five days. The patient was discharged under antibiotic cover, which included Amoxicillin and Metronidazole, for a period of two weeks. Subsequent clinical reviews of



**Figure 2:** Axial view of CT scan showing sequestration involving the maxillary and zygomatic bones.



**Figure 3:** Three dimensional reconstruction of the CT scan demonstrating destruction of the right maxillary bone.



**Figure 4:** Coronal view of CT demonstrating destruction of the right maxillary bone and sequestration in the superior lateral aspect of the antrum.



**Figure 5:** Intraoperative view of surgical site.



**Figure 6:** Post-operative view of the patient six weeks later.

the patient revealed complete resolution of the infection (Figure 6). Histology of the excised tissue confirmed the presence of a sequestrum associated with necrotic bone surrounded by inflamed granulation tissue.

## DISCUSSION

Chronic osteomyelitis of the maxilla or zygomatic bone may result in the formation of a single or multiple extra-oral sinuses, bone loss and facial disfigurement. Patients with co-morbidities such as diabetes, immunosuppressive therapy and radiotherapy are particularly susceptible to developing osteomyelitis, which may be refractory to medical management.<sup>8</sup> Various other systemic diseases have also been associated with osteomyelitis including malignancies, malnutrition and acquired immune deficiency syndrome. Medications that may trigger osteomyelitis include steroids, chemotherapeutic agents and bisphosphonates.<sup>3,8</sup> Paget's disease of bone and florid cemento-osseous dysplasia (FCOD) result in a decrease in vascularity of the affected bone, which predisposes to the development of osteomyelitis.<sup>10</sup>

In this case, diabetes may have contributed to the progression of the infection. Acquired immune deficiency syndrome was excluded as a contributing factor. Treatment after isolating *Actinomyces* by microbial culture should be vigorous.<sup>11</sup> In view of the prolonged duration of the infection, a decision was taken to perform surgical exploration and debridement of the affected areas followed by postoperative administration of antibiotics. It has been shown that lysis of *Actinomyces* species occurs at a rate slower than that seen in other microbes and therefore, prolonged antibiotic administration is recommended.<sup>12,13</sup>

## CONCLUSION

This case of chronic suppurative osteomyelitis of the maxilla emphasises the need for early exploration of an infection site which has draining sinuses associated with the maxillary and zygomatic bone. In lesions that fail to respond to antibiotic therapy, early surgical exploration and debridement is recommended, and should be accompanied by vigorous antibiotic administration, determined after culture and sensitivity investigations. Early resolution of such lesions is desirable to improve the quality of life of patients and to prevent possible life-threatening consequences.

**Conflict of Interest:** None declared.

## References

1. Adekeye EO, Cornah J. Osteomyelitis of the jaws: a review of 141 cases. *Br J Oral Maxillofac Surg* 1985; 23:24–35
2. Miloro M, Ghali GE, Larsen P, Waite P. Osteomyelitis and Osteoradionecrosis. In: *Pierson's Principles of Oral and Maxillofacial Surgery*. 3rd ed. B.C. Decker, Inc. Hamilton; 2004; 313-24
3. Auluck A. Maxillary necrosis by mucormycosis: A case report and literature review. *Med Oral Patol Oral Cir Buccal*. 2007; 12: E360-364
4. Koobusch GF, Fotos P, Goll KT. Retrospective assessment of osteomyelitis: Etiology, demographics, risk factors, and management in 35 cases. *Oral Surg Oral Med Oral Pathol*. 1992; 74: 149-54
5. Miller M, Haddad AJ. Cervicofacial actinomycosis. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 1998; 85: 496-508
6. Hudson JW. Osteomyelitis of the jaws: a 50-year perspective. *J Oral Maxillofac Surg* 1993; 51: 1294-301
7. Topazian RG. Osteomyelitis of jaws. In: Topazian RG, Goldberg MH, editors. *Oral and Maxillofacial Infections*. 3rd ed. Philadelphia: Saunders; 1994; 251-86
8. Singh M, Singh S, Jain J, Singh KT. Chronic suppurative osteomyelitis of maxilla mimicking actinomycotic osteomyelitis: A rare case report. *Nat J Maxillofac Surg*. 2010; 1: 153-6
9. Yadav S, Malik S, Mittal HC, Puri P. Chronic suppurative osteomyelitis of posterior maxilla: A rare presentation. *J Oral Maxillofac Pathol*. 2014; 18 : 481-6
10. Arunkumar JS, Naik AS, Prasad KC, Santhosh SG. Role of nasal endoscopy in chronic osteomyelitis of maxilla and zygoma: a case report. *Case Rep Med*. 2011; 1-3
11. Goldstein BH, Sciubba JJ, Laskin DM. Actinomycosis of maxilla: review of literature and report of case. *J Oral Surg* 1972; 30: 362e6
12. Barnard D, Davies J, Figdor D. Susceptibility of *Actinomyces israelii* to antibiotics, sodium hypochlorite and calcium hydroxide. *Int Endod J* 1996; 29: 320e6
13. Garant PR. Light and electron microscopic observations of osteoclastic alveolar bone resorption in rats monoinfected with *Actinomyces naeslundii*. *J Periodontol* 1976; 47: 717e23