

Management of chronic suppurative osteomyelitis in a patient with pycnodysostosis by intra-lesional antibiotic therapy

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Abstract

Pycnodysostosis is a rare sclerosing bone disorder characterized by short stature, brachycephaly, short/stubby fingers, open cranial sutures/fontanelle, and diffuse osteosclerosis, where multiple fractures of long bones and osteomyelitis of the jaw are common complications. We present a rare case of pycnodysostosis with chronic suppurative osteomyelitis of the mandible in a 36-year-old woman; which was nonsurgically managed by a conservative approach involving a novel protocol referred to as intra-lesional antibiotic therapy.

Key words: Antibiotic, conservative management, mandible, osteomyelitis, pycnodysostosis

INTRODUCTION

Pycnodysostosis, a rare bone dysplasias with an estimated prevalence of 1/million is characterized by physical features of dwarfism, hypoplastic nails, blue sclera, proptosis, parrot beak nose, frontal bossing and radiographic features of osteosclerosis, multiple fractures, acro-osteolysis of the distal phalanges, nonossified fontanelles, and clavicular dysplasia.^[1-4] It is a autosomal recessive disease due to mutations mapped to chromosome 1q21 region that lead to cathepsin K (cysteine protease) deficiency in osteoclasts.^[3,5,6] Faulty bone metabolism^[7,8] makes these patients susceptible to osteomyelitis of the jaws which can be complicated further by pathologic fractures.^[9-14] The management of this condition is complicated and has intrigued surgeons for decades as the treatment options range from surgical debridement of the sequestrum^[15] with concomitant antibiotic therapy followed by surgical correction using a reconstruction plate,^[11] or using a vascularized bone graft^[14] to conservative therapies such as antibiotic coverage, hyperbaric oxygen therapy and simple curettage of the sequestrum.^[9,11,12,15] We report a rare case of Pycnodysostosis with chronic suppurative osteomyelitis of the left body of mandible which was successfully maintained conservatively only with systemic and local antibiotic therapy for 3 years due to “patient’s refusal” to surgical intervention. For local antibiotic therapy, we used a previously unreported protocol of intra-lesional antibiotic administration, naming this innovative approaches intra-lesional antibiotic therapy (ILAT) technique.

CASE REPORT

A 36-year-old female patient reported to the Department of Oral and Maxillofacial Surgery with a complaint of pain and purulent discharge on the left side of the face since 3 years. She gave a history of extraction of mandibular first molar, multiple fractures of lower limbs since two decades for which she was conservatively manage data primary health center. Clinical examination revealed short stature [height-122.4 cm, Figure 1a], underweight (29 kg), prominent nose, accentuated nasolabial fold [Figure 1b], stubby fingers [Figure 1c] and blue sclera [Figure 1d]. Intra-orally a mucosal defect with bone exposure measuring 8 mm × 4 mm in relation to the left posterior mandibular ridge was observed [Figure 2a]. Purulent discharge was evident through an extra-oral draining sinus in the mandibular left body region [Figure 2b]. Radiographic examination showed evidence of the generalized diffuse osteosclerosis and acro-osteolysis [Figure 3]. Antero-posterior and



Figure 1: Clinical examination revealing: (a) Short stature, (b) prominent nose, accentuated nasolabial fold, (c) stubby fingers, and (d) blue sclera

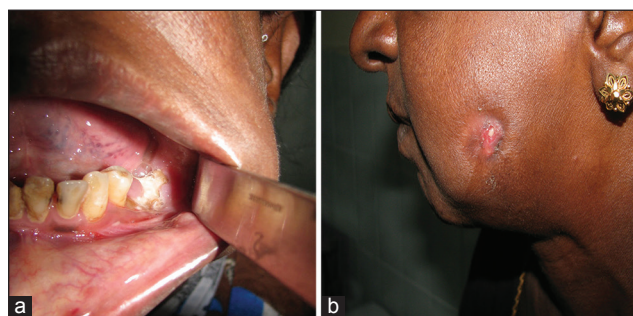


Figure 2: (a) Intra-oral photograph showing mucosal defect with bone exposure involving left posterior mandibular ridge. (b) Extra-oral photograph showing purulent discharge evident through extra-oral draining sinus

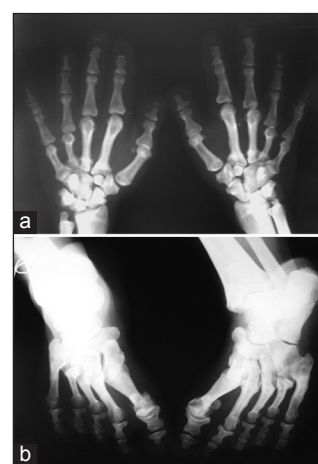


Figure 3: (a) X-ray of hands showing evidence of acro-osteolysis. (b) X-ray of feet showing evidence of acro-osteolysis

lateral views of the skull indicated straightening of the mandibular angle and widened coronal suture with persistence of the anterior fontanelle. Multiple healed old fractures of the femur, tibia and fibula were also

observed in the radiographs. The orthopantomograph showed a sequestrum in relation to the left body of the mandible [Figure 4a]. The computed tomography scan revealed a sinus tract arising from the sequestrum to the skin surface suggesting osteomyelitis. It also showed evidence of root remnants of the molar ankylosed within the sequestrum [Figure 4b]. Routine blood investigations, urine analysis and specific diagnostic tests for calcium, phosphorous and alkaline phosphatase levels revealed no significant alterations. Following thorough investigations and clinical correlations the patient was diagnosed to be a case of Pycnodysostosis with chronic suppurative osteomyelitis secondary to extraction of the left mandibular first molar.

All the treatment options were explained to the patient, but her persistent refusal for any surgical therapy necessitated conservative management to contain the disease and provide symptomatic relief. A previously unreported protocol for intra-lesional antibiotic administration for such cases was attempted to examine its feasibility. We called this the ILAT technique. Empiric systemic antibiotic therapy was started with tablet moxifloxacin (400 mg once daily), injection cefotaxime sodium (1 g twice daily), injection metronidazole (500 mg thrice daily) along with oral ibuprofen (400 mg thrice daily). Meanwhile, purulent exudate swab was sent for culture and sensitivity, the reports of which revealed the presence of staphylococcus aureus resistant to ceftazidime, cephalexin, amoxicillin, vancomycin, and ampicillin and sensitive to gentamycin, imipenem and azithromycin. Systemic antibiotics and analgesics along with local drug delivery of gentamicin sulfate 80 mg/2 ml TDS in the form of irrigations through the extra-oral sinus tract and intra-oral mucosal opening

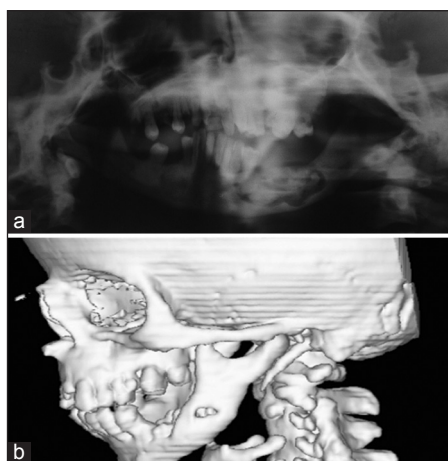


Figure 4: (a) Orthopantomograph revealing sequestrum involving left body of the mandible. (b) Computed tomography scan showing sinus tract arising from the sequestrum to the skin surface suggesting osteomyelitis

was administered followed with the application of extra-oral cotton dressings. 2 weeks of this therapy resulted in a marked reduction in the purulent discharge evident from reduced purulent exudate collected on the dressings. The color of the exudate changed from thick and opaque yellow to thin, and watery pink suggesting transition from purulent to serosanguinous nature thus reflecting clinical improvement. The patient's condition has remained stable when examined at periodic intervals of 3 months for 3 years. Local drug irrigation has been carried out every 6 months during the follow-up period [Figure 5].

DISCUSSION

Pycnodysostosis is a sclerosing bone disorder, which needs to be differentially diagnosed from osteopetrosis and cleidocranialdysostosis. The present case was diagnosed as Pycnodysostosis due to the absence of aplastic anemia, which is a prominent feature in cases of osteopetrosis. While the presence of osteosclerosis ruled out cleidocranialdysostosis as a probable diagnosis. Pycnodysostosis patients are prone to osteomyelitis of the jaws following tooth extractions,^[9-14] which is due to faulty bone metabolism^[7,8] as a consequence of cathepsin K deficiency in osteoclasts.^[3,5,6] Management of such patients has always remained a challenge as the rare occurrence of this disorder makes establishing and recommending treatment protocols difficult. In the present case, the patient's refusal for surgical intervention and the positive findings obtained with conservative management in some previously reported cases^[12] prompted us to use conservative management. An innovative ILAT was used in our case, and the goal of containment of the disease and symptomatic relief was successfully achieved for the past 3 years improving the quality of life of the patient. With well-documented evidence of the successful use of gentamycin-containing polymethylmethacrylate chains for local drug delivery in chronic osteomyelitis cases^[16] and musculoskeletal sepsis,^[17] furthermore along the lines of culture and sensitivity reports, gentamicin sulfate for

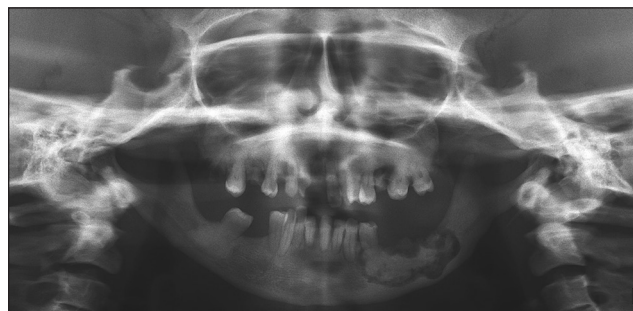


Figure 5: 3 years follow-up orthopantomograph of the patient

local therapy was chosen. Gentamicin sulfate has the advantages of broad antibacterial spectrum, bactericidal action, low rate of primarily resistant pathogens, low allergy rate without fear of nephrotoxic and ototoxic side-effects.

The results obtained in our case using conservative management are supported^[12,18] as well as refuted^[14] by the previous reports, which points toward the conflicting opinion toward the management of this condition. While surgical based reconstruction approaches are successful^[13,15] in some cases, the use of novel methods to treat this condition is justified by the questionable nature of surgical intervention in the event of poor vascularity, diffuse osteosclerosis, tendency to fracture, lack of healthy immune response and patients noncompliance. Moreover, simple curettage, systemic antibiotic therapy and hyperbaric oxygen therapy do not lead to complete resolution of the condition. It is of paramount importance that irrespective of the surgeon's suggestion, the patient must be aware of the risks and benefits of the surgical procedure and its possible complications. It is important that the patient must actively participate in the treatment plan. Although the management adopted in this particular case is not definitive, the goal of containment of the disease and symptomatic relief was successfully achieved and followed for up to 36 months. This ILAT technique may even serve as a basis of management in cases of osteomyelitis where surgical intervention is contraindicated due to other systemic complications or if the patient has to be maintained till the clinical conditions are fit for surgical intervention.

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