



Acute Maxillary Osteomyelitis in a Patient with Severe Covid-19 Pneumonia – A Case Report

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Abstract:

With the advent of efficient antibiotics, maxillary osteomyelitis has become a rare entity. But it is still encountered in patients with immunocompromised states like Diabetes, HIV and malnutrition. We report such a rare presentation in a Covid-19 patient. A 64 year old male patient was diagnosed with Covid-19 pneumonia of the severe type. The day after discharge, He reported to Darshan Dental & Oral cancer center with complaints of acute mobility in left upper teeth. Clinical examination revealed extensive gingival recession of left maxillary premolars and molars. Radiographs revealed severe bone loss involving 25, 26, 27 and 28. He was diagnosed with acute maxillary osteomyelitis associated with chronic periodontitis. Culture and sensitivity of the microbiome of the affected molar area was performed. The mobile teeth were extracted under local anesthesia. The patient was under regular follow up and the extraction site healed without any further complications.

Keywords: *Maxilla, Osteomyelitis, Covid-19, Cefixime, Bone Loss, Tooth Mobility*

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1. Introduction

Several new diseases are reported including Ebola virus, Zika virus, Nipah virus, and coronaviruses (CoVs). Recently, a new type of viral infection emerged in Wuhan City, China, and initial genomic sequencing data of this virus do not match with previously sequenced CoVs, suggesting a novel CoV strain (2019-nCoV), which has now been termed severe acute respiratory

syndrome CoV-2 (SARS-CoV-2). COVID-19 is caused by SARS-CoV-2 and has become a global pandemic. Elderly males with cardiovascular disease, obesity and/or Diabetes mellitus are at higher risk for severe Covid-19. The major route of spread is through infected fluid droplets secreted by the respiratory system of infected individuals.^{1,2}

The virus had spread worldwide within 6 months resulting in greater



morbidity and mortality than previous SARS-CoV and MERS-CoV. It has infected over 12.7 million globally and killed more than 560000 which are ever increasing. It is a pleomorphic, enveloped, positive sense, single-stranded RNA virus with four structural proteins – spike S protein, nucleocapsid N protein, membrane matrix M protein and envelope E protein. It utilizes the lipids from host cell to bud off as a new virion resembling a crown with S proteins. The S protein binds with ACE-2 receptor, priming of S protein by host protease and responsible for viral entry. After successful entry and uncoating of the virus, the genomic RNA is involved in transcription of viral replicase, genomic transcription and replication, translation and production of structural proteins which are assembled as virions and released from the cell. The virus can infect monocytes, macrophages, dendritic cells and lymphocytes. In severe Covid-19 infection, the dysregulated immune system responds by marked increase in cytokine release called as Cytokine storm syndrome /hypercytokinaemia.³

Main problems with Covid-19 pandemic are that disease symptoms are diverse and varied manifestations among patients. Some show severe symptoms whereas others may appear asymptomatic. Severe cases show a typical pattern. Most symptoms appear in about 2-14 days after virus exposure including fever, muscle pain, headache, cough, sore throat, loss of taste or smell. Severe cases show overwhelming lung infection, difficulty in breathing due to pneumonia and development of ARDS which could be fatal in 40% of patients. It may progress to end stage multi-organ failure. It can cause neurodegenerative changes, neurological deficits and damage to BBB. Patients can present with anxiety,

impaired attention, impaired memory, depressed mood and post-traumatic stress disorder.^{3,4,5,6}

There is potential risk of coagulopathy, deep vein thrombosis, large vessel stroke, pulmonary embolism and thromboembolism in severe Covid-19 patients with comorbid conditions like hypertension, obesity, cancer, congestive heart failure, cancer etc. It can affect GI tract and liver presenting with nausea, vomiting, abdominal pain, loss of appetite and diarrhea. Infection of the kidney can lead to proteinuria, hematuria and acute kidney impairments.^{3,5}

Osteomyelitis is inflammation of the bone that begins as a medullary cavity infection that rapidly involves the haversian systems and extend into the periosteum. It tends to occur more frequently in the mandible than the maxilla. Maxilla has significant collateral blood flow, thin cortical bones and bone marrows with struts that make it resistant to infection. But still, maxillary osteomyelitis (OM) can be caused by traumatic, rhinogenic and odontogenic causes. Systemic diseases can compromise the immune system leading to OM.⁷

In this case report, we present a rare case of acute maxillary osteomyelitis in a patient recovering from severe Covid-19 pneumonia.

2. Case Report:

A 64 year old male patient reported to a private multi-specialty hospital with complaints of high grade fever, difficulty in breathing and cough. He was reported to be Covid-19 positive and diagnosed with Covid-19 pneumonia of the severe type. He was under intensive cardiac and respiratory care. He was discharged after three weeks of hospitalization.

The day after discharge, He reported to Darshan Dental & Oral cancer center on



15/9/2020 with complaints of acute mobility in left upper teeth. He was having difficulty in eating due to mobile teeth. Past medical reports showed that at the time of ICU on 31/8/2020, his RBS was 526 mg/dl, Uric acid was 7.7, 101.6 deg F was the body temperature and 18440 was the Total Leucocyte count. He had a positive history of type II diabetes mellitus and hypertension under erratic treatment. On 2/9/2020, HbA1C values was 10.5 indicating poor diabetic control.

Clinical examination revealed extensive gingival recession of left maxillary premolars and molars. Tooth mobility to vertical and lateral forces was noted. There was tenderness on palpation of the maxillary alveolus. (Figure 1)

Radiographs revealed severe bone loss involving 25, 26, 27 and 28. There was a diffuse radiolucency involving the posterior maxilla. (Figure 2) He was diagnosed with acute maxillary osteomyelitis associated with chronic periodontitis.

Culture and sensitivity of the microbiome of the affected molar area revealed mixed microbial infection that was highly responsive to cefixime. (Figure 3)

The mobile teeth - 25, 26, 27 and 28 were extracted under local anesthesia (Figure 4) and patient was prescribed Cefixime 200mg twice a day along with Diclofenac sodium 100mg thrice a day. The patient was under regular follow up and the extraction site healed without any further complications.

3. Discussion:

Diagnosis is very important in immunocompromised patients as it is extremely difficult to treat infectious diseases in such individuals. Dental infections are a predisposing factor for maxillary osteomyelitis. Peravali et al had

reported 68% of OM in diabetic individuals was caused due to hyperglycemia altering the immune response and blood flow distribution in maxilla. 7 Authors have also reported vascular anomalies and coagulation tendencies during and after Covid-19 infections.³ Reported literature from across the world also highlight the importance of co-morbid conditions like old age, male patients, diabetes and immuno-compromised status can increase the risk of contracting Covid-19. ⁴⁻⁶ Our patient was a 64-year old male patient, a chronic diabetic who was not under proper medication as revealed by his high RBS and HbA1C values. It could be the cause for him to contract Covid-19 as a high risk group and end up with severe Covid-19 pneumonia.

The most relevant infections of the jaws are represented by lateral and apical periodontitis, osteomyelitis, peri-implantitis, and their complications, such as facial cellulitis and other infections involving deep spaces of face and neck. The treatment of these conditions involves local procedures and, sometimes, specific antimicrobial drugs after microbial diagnosis. ⁸ Our patient was diagnosed with acute maxillary osteomyelitis due to chronic periodontitis. Microbial culture revealed a mixed aerobic and anaerobic growth that was highly responsive to Cefixime.

Treatment varies from non-invasive medical approach to more invasive radical treatment. A combination of surgical treatment with removal of loose teeth and sequestra was the recommended protocol. ⁷ Our patient also underwent surgical removal of 25-28 under local anesthesia. As the patient was responsive to cefixime, he recovered swiftly without any further complications.

Right diagnosis at the right time could be life saving for the patient. We are



proud that the patient could be identified promptly and relieved of his dental problems without much post-operative morbidity.

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Figures & Legends



Figure 1: Clinical picture showing extensive bone loss, gingival degloving and periodontal disease





Figure 2: Orthopantomograph revealing severe bone loss involving 25, 26, 27 & 28. Diffuse radiolucency is seen the posterior maxillary alveolus extending to the tuberosity region.



Figure 3: Clinical picture showing the microbial swab collection from the oral cavity for culture and antibiotic sensitivity



Figure 4: Picture showing the extracted teeth