ABSTRACT

Various posts COVID-19 complications have been reported recently in the patients. However, there is still a dilemma about whether this oral manifestation is occurred due to corona virus infection or secondary factors resulting from the patient’s systemic condition. These oral conditions in a patient diagnosed after discharge. The pathogen responsible for the pandemic is severe acute respiratory syndrome corona virus 2 (SARS-CoV-2), which has resulted in global healthcare crises and strained health resources. The prevalence of clinical manifestations is still unidentified; the range of COVID-19 manifestations on the oral cavity has been seen in various forms. The current case aims to report a rare finding of bone and soft tissue defect in the mandible as a possible sequel of COVID-19 infection.

Keywords: COVID-19, Mandible, Osteomyelitis, Post COVID.

I. INTRODUCTION

The post-COVID condition is considered a life-threatening illness, ranging from mild symptoms to serious complications. COVID-19 is now declared as a multi-organ disease with a wide range of manifestations. The pathogen that caused the pandemic is severe acute respiratory syndrome coronavirus 2 (SARSCoV2), which has triggered a global medical crisis and depleted healthcare resources.

The current situation of the researchers shows that the coronavirus enters human cells through the receptor for angiotensin converting enzyme 2 (ACE2) through scRNAseq observed in the data analysis. Researchers have identified several organs, which are at increased risk of damage and are susceptible to SARSCoV2[1].

Thus, organs with abundant ACE2 receptor distribution can become virus host cells, causing inflammation in related tissues, such as the tongue and salivary gland tissue. Oral signs and symptoms associated with COVID-19 include changes in taste, recurrent mouth ulcers, desquamative gingivitis, petechiae, and co-infections, such as the growth of a fungus called candidiasis [2].

Since the prevalence of clinical complications is not yet well understood or reported, the range of manifestations of COVID-19 in the oral cavity can be very wide and manifest in a variety of ways. The purpose of this case is to report a rare soft tissue and mandibular defect, which may be a sequel to COVID-19 infection.

Osteomyelitis is an inflammation of the bone cortex and bone marrow, which usually occurs on the chin after a chronic infection [3]-[5]. Local conditions that adversely affect blood supply or cause tissue necrosis can also make the host susceptible to bone infections or local osteomyelitis [6], [7]. Osteomyelitis is diagnosed based on the patient's medical history, clinical examination, and the results of the surgical and radiological examination. Histopathological examination can be compatible with the diagnosis, and microbiological examination is also helpful [8], [9].

Osteomyelitis has a series of clinical manifestations that depend on the virulence of the infectious organism, the resistance of the host, and the response of the peristeam to inflammation [10].

Few reports in the literature of mandibular osteomyelitis after conventional dental treatment [6], [7]. This article reports a case of a COVID patient with mandibular osteomyelitis.

II. CASE PRESENTATION

A. Patient Information

60- year old male patient was a known case of Diabetes Mellitus type II from 25 years with other co-morbidities like Ischemic Heart Disease, Hypertension, operated case of Coronary Artery Bypass Graft (CABG) for triple vessel involvement, Chronic Kidney disease, Glaucoma, and was on medication for the same.
He had a chief complaint of fever for 3 days and throat pain from 1 day, the patient was advised for Rapid COVID Antigen and RTPCR reported Negative and positive respectively on the same day, later, HR-CT scan was planned, it showed ground-glass opacities on the left and right upper lobes of the lungs with the CT severity index score 11/25. With the initial investigational reports, the patient was admitted to the intensive care unit (ICU) of the multispecialty hospital with a well-oriented and conscious state. The treatment had been started as per the Standard COVID-19 Treatment Protocol (Revision 4), received InjRemdesivir 200 mg stat dose, along with InjPiptaz (pipericillin + Tazobactum) 4.5 gm, Inj Methyl Prednisolone 80mg, Inj LMWH 0.4ml Sc and other prophylactic medicines. On the same date night, his condition deteriorated, and oxygen Saturation level fell below 80%, hence Non –invasive ventilation support for 5-8 hours and Inj Tocilizumab had been started with the doctor orders. The patient did not tolerate high flow oxygen pressure and later kept on the oxygen reservoir bag on 15 liters of oxygen for 5 days, On the 6th day, his condition was improvised as his SPO2 level increased to 90% on 10 liters on oxygen reservoir bag. With this condition, patient has been discharged from the hospital.

B. Clinical Findings
On the 8th day, the patient reported loosening of teeth, inability to chew food on the lower left back tooth region, and atypical facial pain followed by numbness, radiating pain to the left ear and head, as he had a habit of tobacco chewing for 25 years. On intraoral examination, blackish discoloration of the teeth, gingival enlargement, foul smell, Grade II mobility of 34, 35, 36, 37, tenderness on percussion, multiple small pus-filled vesicles were observed concerning the lower left back tooth region confined to the attached gingiva. The patient was advised for all routine blood investigations radiological investigations to rule out all plausible causes. Computed tomography (MDCT) revealed the bony architecture of the mandible appeared normal, loss of lower left two incisors (31, 32), Canine (33), and mild right maxillary sinusitis. Pus sample was sent for culture and sensitivity revealed the presence of organism Klebsiella pneumonia and sensitive to colistin.

C. Therapeutic Intervention
There was no blood supply on the necrosed area. As the patient condition was not bearable for the surgical intervention, prophylactic treatment had been initiated to prevent further infection Extractions of mobile teeth along with curettage of the involved region was planned under aggressive antibiotic and antifungal agents included Tab Metronidazole 400 mg, Tab Flucanazole 200 mg, Tab Zerodol SP and Povidine mouthwash for further 10 days. The patient was also explained with various rehabilitation options post healing like Dental Implants and Removable prosthesis also patient was asked to control his blood glucose levels with a proper treatment plan to avoid future complications.

III. DISCUSSION
Jaw osteomyelitis is a rare disease related to a variety of systemic diseases, including diabetes, autoimmune diseases, malignant tumors, malnutrition, and acquired immunodeficiency syndrome. The drugs associated with osteomyelitis are steroids, chemotherapeutics, and bisphosphonates [3]. The purpose of this case report is to educate clinicians and researchers on potential post-COVID complications.

The diagnosis of osteomyelitis is based on the presence of painful isolated and purulent areas in the jaw teeth that do not respond to debridement and conservative treatment. The tissue sample must be cultured for the presence of microorganisms. After obtaining the soft tissue and bone samples, they should be sent to the microbiology laboratory for microbiological identification. The patient has an active infection and pus drains from the open socket formed by the missing tooth. The pus is used for culture and sensitivity and is intended to be used for the growth and cultivation of fungi. The culture samples showed the presence of the Gram-negative bacterium Klebsiella pneumoniae, which was sensitive to colistin and resistant to most other antibiotics. In this case, due to chronic kidney disease, the patient is contraindicated with colistin.

Complications occurred after being discharged from COVID-19 hospital. The patient was taken to an oral surgeon for a detailed clinical examination, and the oral surgeon confirmed a case of osteonecrosis over osteomyelitis.

The main treatment of localized osteomyelitis in a patient with many systemic conditions is to remove the etiology of the disease as well as antibiotic therapy to prevent postsurgical infection [3].

Antibiotic treatment should be started as soon as possible and can be changed according to the results of the antibiotic spectrum [11]. Treatment includes complete surgical debridement and long-term antibacterial treatment. Because the patient's condition is not suitable for surgical intervention, antibacterial treatment is recommended. There is severe

Fig. 1. Oral Examination of lower left back of mandible showing blackish discoloration of the teeth, inflamed gingival.

Fig. 2. CT scan showing loss of bone in the affected area.
necrosis in the abduction area, there is no blood supply, and the area feels abnormal. Even after treatment, the condition of the mandible is still the same, but the intermittent pain is relieved, and the necrosis is limited to this area. It is advisable to use povidine-iodine mouthwash regularly.

IV. LIMITATIONS

This study has limitation as the patient is a case of Chronic Kidney Disease, to diagnose and rule out the spread of infection into the affected area, Magnetic Radiography Imaging with contrast was considered as an appropriate investigational tool, but, it was not advisable to the patient.

Osteomyelitis of jaw have best regime is the removal of sequestra or surgical intervention, as the patient was operated case of CABG triple vessel with Ischemic Heart Disease, and, were on continuous oxygen supply and monitored hourly due to less cardiac output, therefore, recommendation for the medicinal management was needful at the earliest.

V. CONCLUSION

Many researchers have been working on the remedy for the challenging pandemic COVID-19. Some rational drugs and vaccine have been available into the public domain to minimize the mortality around the world. In contrary COVID 19 has been evolving more faster, new strain has been mutating and replicating before the human understanding, not only virus related symptoms, patients are also suffering from the post COVID complications. In present case report, there is riddle about the etiopathogenesis and spread of infection in the mandible. We hypothesize possible reason to diagnose the infection and manage patient as the patient was received continuous oxygen requirement, first cause probably the presence of systemic conditions. Medication Related Osteonecrosis of the Jaw (MRONJ) as the patient received high dose of steroid of 600-800 mg, use of Injectable tocitizumab, whom has severe adverse events, or, hospital acquired infection may lead to deteroiite the quality of life due to mandibular jaw involvement, chronic pain, tooth exfoliation and compromised function. The present case shows only oral drug treatment was needful for the patient with continuous oxygen therapy and of systemic disease. The patients with systemic co-morbidities are prone to be affected by the virus, our prior aim is to made management to fade away the virus, not to make victims live with other complications after the completion of the course of drug.

We need to be more aware in future about COVID-19 drugs regime and their adverse drug reaction, will eventually help to manage patients post COVID complications, and prepare our practices in the near future to face this kind of complications as well as to build protocols for their management in favors of patients, clinicians and humanity.

REFERENCES

[1] Zou X., et al., “Single-cell RNA-seq data analysis on the receptor ACE2 expression reveals the potential risk of different human organs vulnerable to 2019-nCoV infection”, Frontiers of Medicine, 2020, 14.2, pp.1 85-192.
[2] Amorim Dos Santos J., et al., “Oral Manifestations in Patients with COVID-19: A Living Systematic Review”, Journal of Dental Research, 2020, vol. 100(2), pp. 141-154.
[3] Yeoh SC, Macmahon S, Schifter M., “Chronic supplicative osteomyelitis of the mandible: case report”, Aust Dent J.,2005; 50:200–3.
[4] Kushner G M, Alpert B., Osteomyelitis and osteoradionecrosis. In: Miloro M, Ghali GE, Larsen PE, Waite PD. eds. Peterson’s Principles of Oral and Maxillofacial Surgery. 2nd ed. London: BC Decker; 2003. 313-21.
[5] Fonseca RJ, Turvey TA, Betts NJ. Oral and Maxillofacial Surgery. 1st ed. Philadelphia: WB Saunders; 2000. 485-90.
[6] Yavuz MS, Kaya GS, Yalcin E, Aras MH., “Mandibular bone necrosis caused by use of arsenic paste during endodontic treatment: two case reports”, Int Endod J, 2008;41:633-7.
[7] Ozmeriç N., “Localized alveolar bone necrosis following the use of an arsenical paste: a case report”, Int Endod J, 2002; 35:295-99.
[8] Senel FC, Saracoğlu TEKİN U, Durmus A, Bagis B., “Severe osteomyelitis of the mandible associated with the use of non-nitrogen-containing bisphosphonate (disodium clodronate): report of a case”, J Oral Maxillofac Surg,2007; 65:562–5.
[9] Dimitrakopoulos I, Magopoulos C, Karakasis D., “Bisphosphonate-induced avascular osteonecrosis of the jaws: a clinical report of 11 cases”, Int J Oral Maxillofac Surg, 2006; 35:588–93.
[10] Jones J, Amess TR, Robinson PD., “Treatment of chronic sclerosing osteomyelitis of the mandible with calcitonin: a report of two cases”, Br J Oral Maxillofac Surg,2005; 43:173–6.
[11] Clover MJ, Barnard JD, Thomas GJ, Brennan PA., “Osteomyelitis of the mandible during pregnancy”, Br J Oral Maxillofac Surg,2005; 43:261–3.