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Post Covid-19 Complication in Oro Maxillofacial - A Case Report

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Abstract

In late 2019, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) emerged as the cause of a cluster of pneumonia cases in China and the corresponding disease which is spreading quickly around the world was designated as Coronavirus Disease 2019 (COVID-19), has resulted in a pandemic. Especially in patients with severe/critical disease COVID-19 has associated with a set of coagulation abnormalities that increase the risk of thromboembolic events.

In this case report we discuss about a treated case of COVID-19 which was reported to us, after an apparent clinical improvement, developed dental complication in maxilla with multiple pus discharging sinuses, mobility in teeth & osteolysis of alveolar bone along with involvement of maxillary sinus, 2 weeks after recovery of Covid-19 disease. One of the potential complications of COVID-19 are thromboembolic events which can manifest later in the disease course. Possibly a thromboembolic event must have blocked one of the terminal vessels in maxilla leading to this type of avascular necrosis.

Hence many such discussion are getting raised about the prevention of thromboembolic events in selected group of patients with history of COVID-19 disease.

Keywords: COVID-19; Maxillary necrosis; Thromboembolism; Pneumonia

Introduction

In late 2019, a novel coronavirus whichemerged as the cause of a cluster of pneumonia cases, in Wuhan, a city of the Hubei Province in China has now designated as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) [1]. Around the world it has spreaded quickly resulting in a pandemic [2]. The disease caused by the SARS-CoV-2 was named as coronavirus disease 2019 (COVID-19) by World Health Organization (WHO) [3], COVID-19 affected more than 18 million people and around 700,000 people died according to the last WHO report [4].

The clinical spectrum of COVID-19 ischaracterized by respiratory failure, shock and/or multiorgan dysfunction, which ranges from mild infection with or without pneumonia, severe pneumonia with respiratory distress and/or hypoxia in ambient air to critical disease [5]. In patients with severe disease, the acute respiratory distress syndrome (ARDS) is the most frequent complication (19.6% - 29%) [6,7], resulting in a remarkable

hypoxemic respiratory failure. However, several other clinical events could aggravate the course of COVID-19 including thromboembolic events.

Due to rich vascularity, maxilla rarely undergoes necrosis and if at all necrosis occur it is due to bacterial, viral, or fungal infections. Necrosis mainly infects immunocompromised patients. The infection begins in the nose and paranasal sinuses due to inhalation. Either by direct invasion or through the blood vessels the infection can spread to orbital and intracranial structures [8].

It occurs by invading the arteries leading to thrombosis that subsequently causes necrosis of hard and soft tissues. In the medical literature there are no reported cases of post covid-19 dental complications. Here we report a case of maxillary avascular necrosis by maxilla after a thromboembolic event, causing impaired vascular supply in an uncontrolled diabetic patient to emphasize early diagnosis of this potentially fatal disease. Early diagnosis and prompt treatment can reduce the mortality and morbidity of this lethal disease.

Case Report

A 32-year-old diabetic male reported with inability in chewing from one side since few days. Patient gave history of positive Covid-19 hospitalization a month back and recovered well in 10 days thereafter. On intra-oral clinical examination, multiple pus drainage sinuses were seen on the left maxillary teeth alveolus starting from left upper central incisor to left upper second molar. All teeth were grade two mobiles but non carious (Figure 1a-c).

Figure 1a,b,c: *Multiple pus drainage sinuses on the left maxillary teeth alveolus starting from left upper central incisor to left upper second molar and all teeth were grade two mobile with no palatal swelling.*

Patient did not have any other relevant past dental history. OPG was done which showed irregular radiolucencies in left upper maxilla.

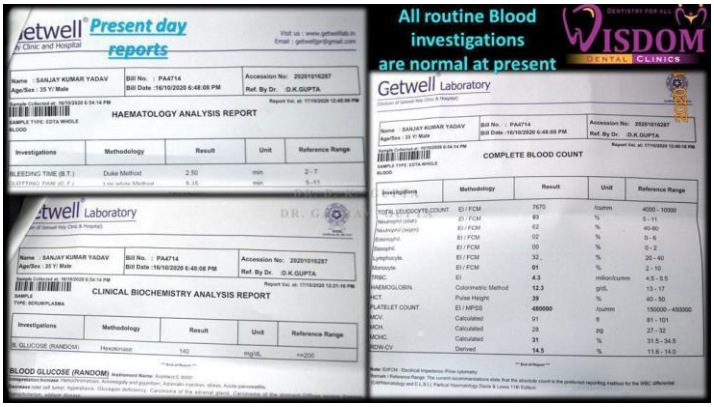
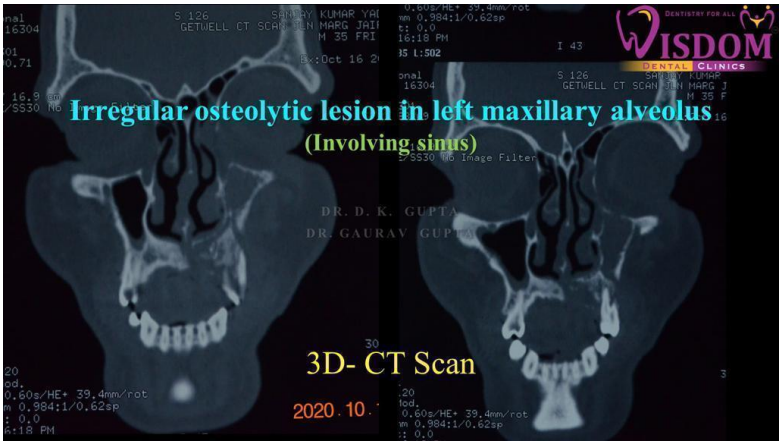
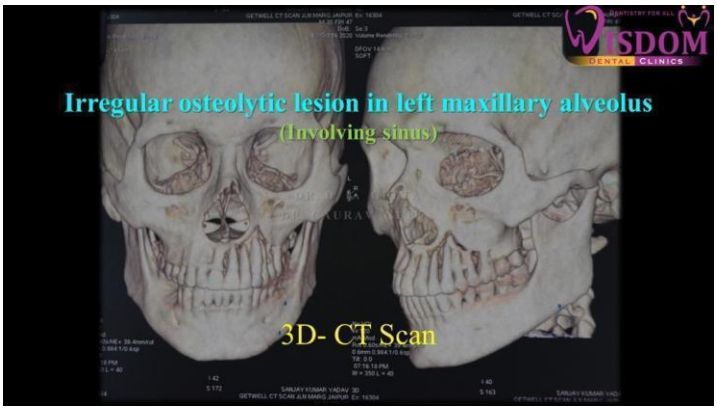


Figure 2: *Routine Blood examination done.*

All routine blood examinations came normal (Figure 2). 3D CT scans were done which showed irregular osteolytic lesions in whole of the left maxillary alveolus involving maxillary sinus as well (Figure 3a-c).





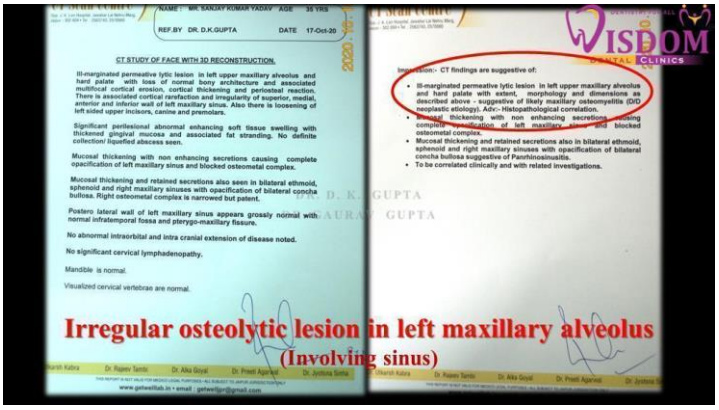


Figure 3a,b,c: *3D CT scan done.*

Looking at the severity of lesion it was planned to extract the involved teeth, curettage the lesion, removed the complete inflamed bone and sinus lining under local anesthesia. Mucoperiosteal flap was raised till healthy bone is seen, mobile teeth were removed &along with it the necrotic bone came out (Figure 4a-e).

Figure 4a-f: *Mucoperiosteal flap was raised till healthy bone is seen, mobile teeth were removed &along with it the necrotic bone.*

Infected sinus lining was completely removed (Figure 5).

Figure 5: *Removal infected sinus lining.*

Iodoform dressing was packed in the cavity for hemostasis followed by 3.0 black silk wherein primary closure of the defect was achieved (Figure 6a,b). Three specimens were collected from inflamed soft tissue, necrosed bone and maxillary sinus lining and sent for histopathological examination.

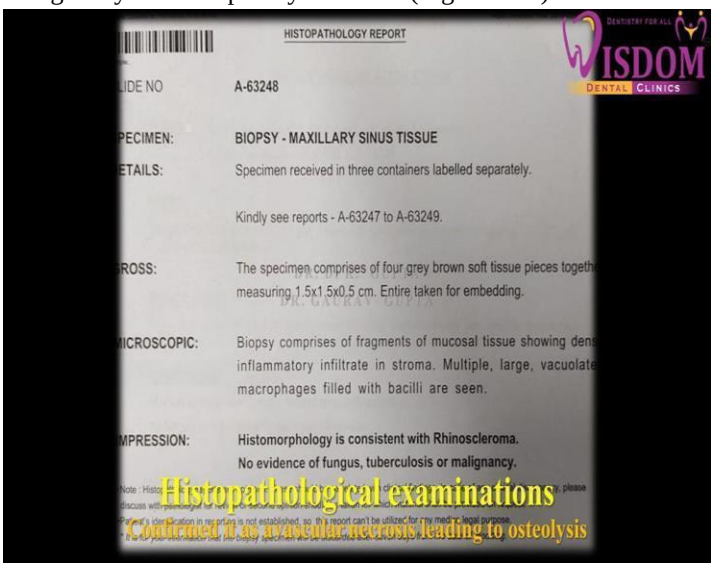
Figure 6 a,b: *Iodoform dressing was done with suturing.*

On third day, iodoform dressing was removed (Figure 7a,b).

Figure 7a,b: *On third day, iodoform dressing was removed and sutured back.*

Figure 8a,b: *Uneventful 10th day healing.*

Routine anti-microbial, anti-inflammatory drugs were prescribed, and patient was told to follow strict oral hygiene measures. On 10th day, all sutures were removed, the healing was uneventful (Figure 8a,b). The histopathological reports of the lesion & bone showed signs of inflammation while sinus lining showed rhinoscleroma, possibly because of Kelbsiella bacteria which is involved in pneumonia. The presence of any fungus or malignancy was completely ruled out (Figure 9a-c).



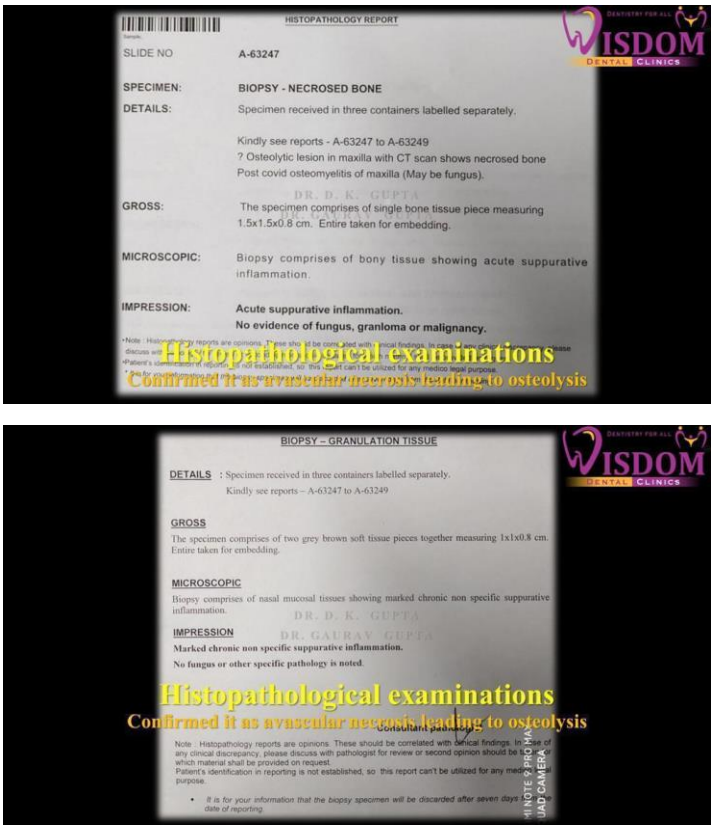


Figure 9a,b,c: *Histopathological report of retrieved bone ,sinus and granulation tissue.*

Discussion

We reported a case of patient who has clinically recovered from COVID-19 but has developed multiple pus discharging sinuses along mobility in teeth with inability to chew. CT of face showed irregular osteolysis of maxillary alveolar process & other parts of maxilla with maxillary sinus involvement, possibly an avascular necrosis. This is highly unfortunate and unprecedented with no reported cases in literature. Firstly, several studies reported the occurrence of thromboembolic phenomenon in patient settings, especially in ICU patients with severe or critical COVID-19 [9-14]. Secondly, we retrieved only ten articles in a PubMed search for papers concerning thromboembolic events after COVID-19 cases [15,16].

Patients with mild COVID-19 recover within two weeks, according to the last WHO report [17]. But a few studies reported cases of mild COVID-19 which complicate with venous thromboembolism events even in the active phase of the disease [15-22].

The normal immunologic response of patients to infections can get altered in uncontrolled diabetes mellitus. Such patients have altered polymorphonuclear leukocyte response with decreased granulocyte phagocytic ability. Reports have suggested that immunocompromised patient's serum has reduced to inhibit Rhizopus invitro, which makes them suitable hosts to opportunistic infections [23].

The pathogenesis of COVID-19-related hypercoagulable state is evolving. In some severe COVID-19 cases, an intense and uncontrolled inflammatory response seen to contribute to thrombosis, especially in the microvasculature due to thromboinflammation [24]. A subgroup of critical COVID-19 patients exhibits clinical and laboratory features related to a hyperinflammatory syndrome resembling a secondary haemophagocyticlymphohistiocytosis (SHL) such as unremitting fever, hyperferritinemia, hypertriglyceridemia and ARDS [25]. In these cases, increased levels of proinflammatory cytokines, such as interleukin (IL)-1B, interferon-gamma (IFN-γ), inducible protein 10 (IP10), monocyte chemoattractant protein 1 (MCP1) and tumor necrosis factor-alpha (TNF-α), were observed [7]. This inflammatory response causes damage to the vascular endothelium, compromising its thrombo-protective state [24]. Several of coagulation abnormalities seen in SARS-CoV-2-infected patients due to activation of coagulation cascade caused by inflammation and endothelial injury.

Clinical and laboratory features compatible with a SHL were not exhibited by any of our patients. Still damage to the endothelium caused by inflammation in the pathogenesis of APE in these cases cannot be ruled out.

According to the literature, studies showed more male predilection than women. One of the explanations for the male sex risk factor for severe COVID-19 is the possible sex-related differences on the immune response to SARS-CoV-2 infection [26]. The reason behind this theory is that women produce less inflammatory cytokines after infection, which is linked with their shorter disease duration and higher survival rates [27]. It has also been noted that male ratio is more prone for thrombosis when hospitalized with COVID-19 [11].

Differential diagnosis can be malignant salivary gland tumor arising from the accessory glands of the palate, squamous cell carcinoma of maxillary sinus as chronic ulcers with raised margins causing exposure of underlying bone, other features can be antral carcinoma, which is local pain, swelling, epiphora, diplopia, numbness, epistaxis, or nasal discharge. In our patient no symptoms suggestive of any malignancy [8].

Extranodal NK T-cell lymphoma (nasal type angiocentric lymphoma or midline lethal granuloma) characteristically occurs in midline, affecting the oronasal region. Patients may report nasal stuffiness, pain, and palatal swelling in the initial stages. Patients develop progressive areas of ulceration that can lead to bone necrosis and perforation latterly. Wegener's granulomatosis is an uncommon condition characterized by a necrotizing granulomatous condition of respiratory tract, widespread vasculitis and necrotizing glomerulonephritis with common presenting signs and symptoms include nasal stuffiness and

epistaxis with or without complain of fever, sinusitis, rhinorrhea, arthralgia, and weight loss [8].

In strawberry gingivitis, gingiva has a peculiar erythematous hyperplasia. It causes oral-antral fistula by destructing underlying palatal and alveolar bone. Due to extension of infections such as acute necrotizing ulcerative gingivitis (ANUG) from the gingiva to bone, necrosis of bone occurs. But in the reported case nothing as such was seen [8].

Conclusion

Thromboembolism is a potential complication of mild COVID-19 cases and may occur late in the course of the disease or even after its recovery, when the symptoms related to the acute illness have already disappeared. These thromboembolic events can result into avascular necrosis because of impaired vascular supply in certain parts of body like maxilla in this case. Hence according to all the above events more literature and study is required about the prevention of thromboembolic events in selected group of patients with COVID-19.

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