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Original Research

Conservative is the new modern: Management of maxillofacial trauma amid covid-19 pandemic

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***ABSTRACT*:**
COVID-19 has emerged as a pandemic which has unprecedented impact on all aspects. A key strategy for frontliners in managing the COVID-19, is mitigating transmission via awareness and implementing preventive methods. As behavior modifications, like social distancing, lockdowns, and quarantine of suspected cases are measures to prevent its spread among general population, the healthcare providers are at the frontline in this fight against the coronavirus. Maxillofacial surgery is one of those specialties that had to adapt to this outbreak as we deal directly with oral cavity, thus exposed to aerosolized form of virus. The aim of this study was to examine the effect of this pandemic on maxillofacial surgery practice, and how current situation is being managed. Retrospective analysis of data done from 23 March 2020 to 31 July 2020 included age, gender, etiology and treatment of maxillofacial trauma in HPGDC, Shimla. The objective was to collect and analyze the data, to highlight the importance of traditional conservative treatment during the times of current pandemic and, adopt suitable guidelines for management of maxillofacial trauma patients. The treatment was completed with limited resources, while ensuring the safety of both patient and the medical personnel.
Keywords:-Coronavirus disease 2019 (COVID-19); SARS-CoV-2; Maxillofacial Trauma

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INTRODUCTION

21st century is the era of advancements in surgical interventions for managing maxillofacial trauma worldwide. However, the sudden pandemic outbreak has introduced us to a challenging situation and directed the maxillofacial surgeons to look for the older methods for benefitting the patients during this time of crisis.The novel Coronavirus was first identified in Wuhan, Hubei province in China with rapid spread to other provinces of China and other countries in no time. It was thus declared as a global pandemic by WHO on March 9th2020, becoming a "Public health emergency of international concern"[1]. According to the latest data available, globally as reported on 5th October2020, it has affected as many as **35,109,317** lives, causing more than **1,035,341** deaths worldwide [2].

Speedy expansion of the disease at an alarming rate has directed the government to take appropriate counter measures to halt its progression. The two key points framed focused on reducing the likelihood of the infection and enhancing the health care system of all countries. The scarcity of the resources or limited medical setups, and equipment to run health facilities on routine basis remains a point of concern. Hence, it calls for the need of implementation of certain supportive decision making. The prime goal of amendments in the treatment modalities would be to bring changes in the current practice in oral & maxillofacial practice as followed by other medical specialties [3]. Adapting to this outbreak is highly important for the maxillofacial surgeons, as the treatment procedures are at high risk of aerosolization of respiratory droplets during procedure in upper aerodigestive tract [4].

Limited resources and high risk of spread of SARS-nCov2,came out as bigger challenges. Being the special category of health care workers, area of work, and the type of instrumentation makes the frangibleness high as we cannot avoid or choose to ignore the spread of disease through the way of droplet transmission, contact with oral cavity, and

with the patient's secretion (i.e. saliva, mucous, blood). Risk prevails to health care worker both during the diagnosis and treatment procedure and in turn becoming a source of contagion[1].Therefore, a shift was important to the conservative form for managing maxillofacial trauma keeping both the scenarios in mind i.e. treating the maxillofacial trauma patients and at the same time keeping check on disease transmission. The patients were managed with conservative treatment options of the older times. The latest surgical interventions are not implicated till it is the last resort.

MATERIAL AND METHODS

The details of patients who reported to the Department of Oral and Maxillofacial Surgery from March 23rd 2020 to July 31st2020for the treatment of Maxillofacial trauma, were analyzed retrospectively. A total of 79 maxillofacial trauma patients reported to our department. Patient's demographic details, etiology, diagnosis and treatment modality as adopted according to pandemic scenario were taken into consideration.

RESULTS

A total of 79 patients were included in this study, out of which 62 were male and 17 were females. The male to female ratio was 3.6:1.The range of age varied from 4 to 72 years, with mean age of 35.75 years. All the patients were residents of various districts of Himachal Pradesh. During this COVID - 19 lockdown, main etiology of trauma cases presented to our department was accidental falls out of which majority of patients were belonging to rural population followed by road side accidents, interpersonal violence and bear mauling.

Among these trauma patients, fractures of mandible were most common (25), followed by zygomatico-maxillary complex (17), orbital wall (11), nasal bone (7), frontal bone (5), LefortI and II(4,3 respectively), Nasoorbito-ethmoid fracture(1) with associated soft tissue injuries.None of these patients were managed by ORIF. The only treatment option followed was closed reduction, with IMF using Erich arch bar and ivy eyelet wiring, cap splint with circum-mandibular wiring wherever needed to correct malocclusion, and stabilization of nasal bone fracture using nasal bone splinting.

Figure No. 1: Age and sex distribution

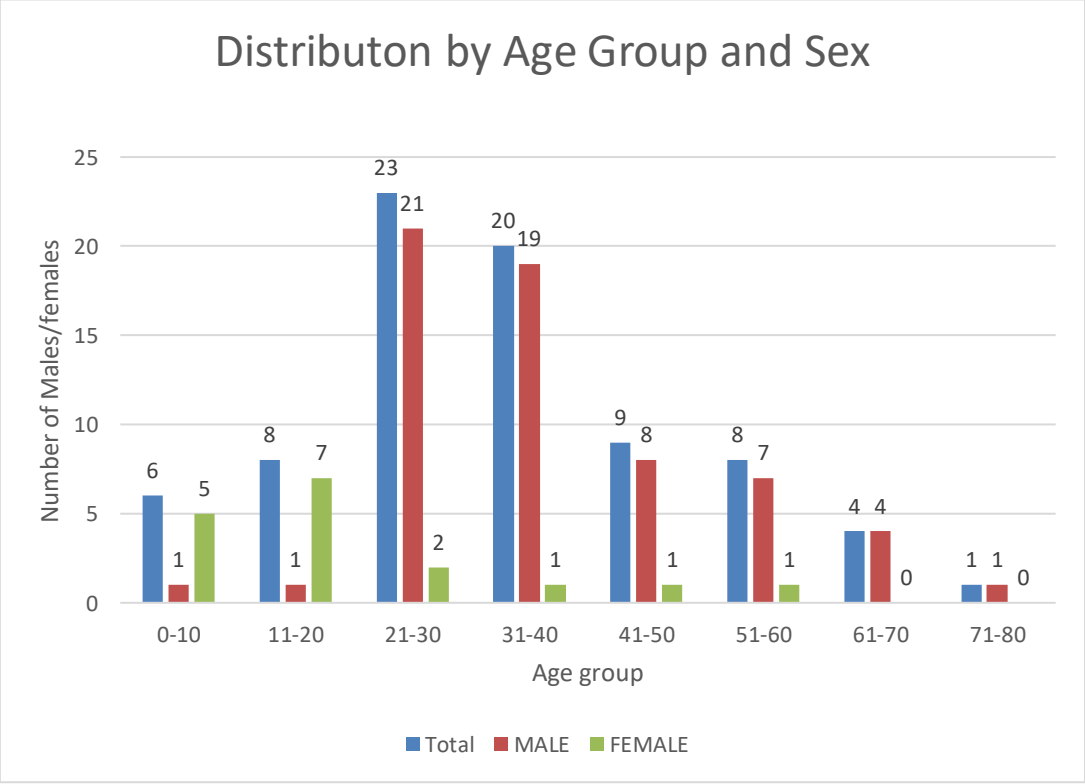


Figure No. 2: Mode of trauma

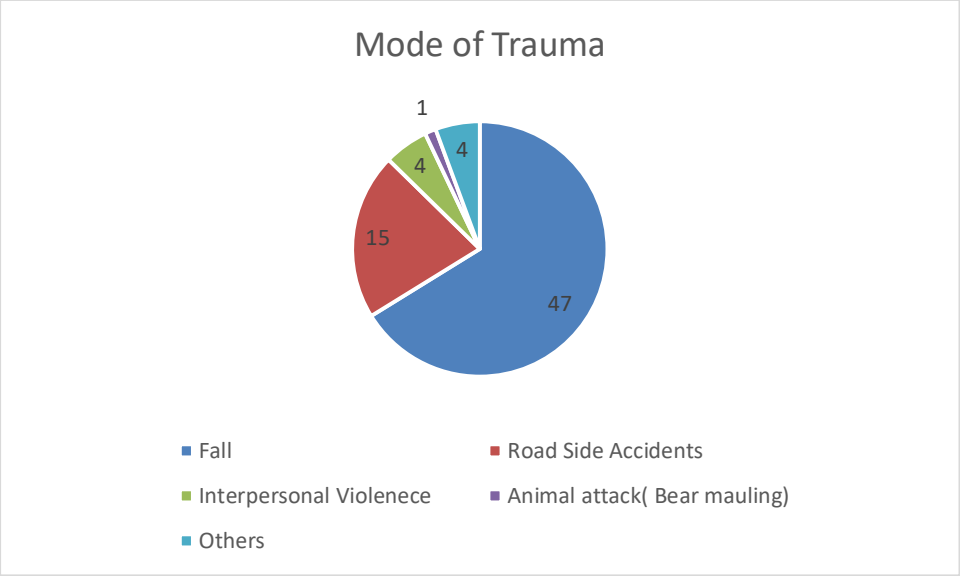


Figure No. 3: Incidence of facial fractures

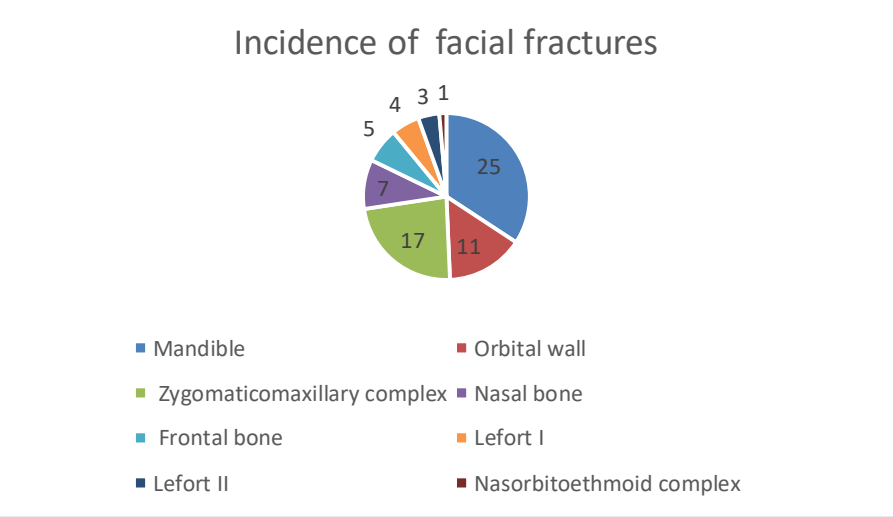


Figure No. 4 – Fracture Right Lefort-2 with Midpaltal split managed by closed reduction with Transpalatal wiring and IMF using Erich Arch Bar

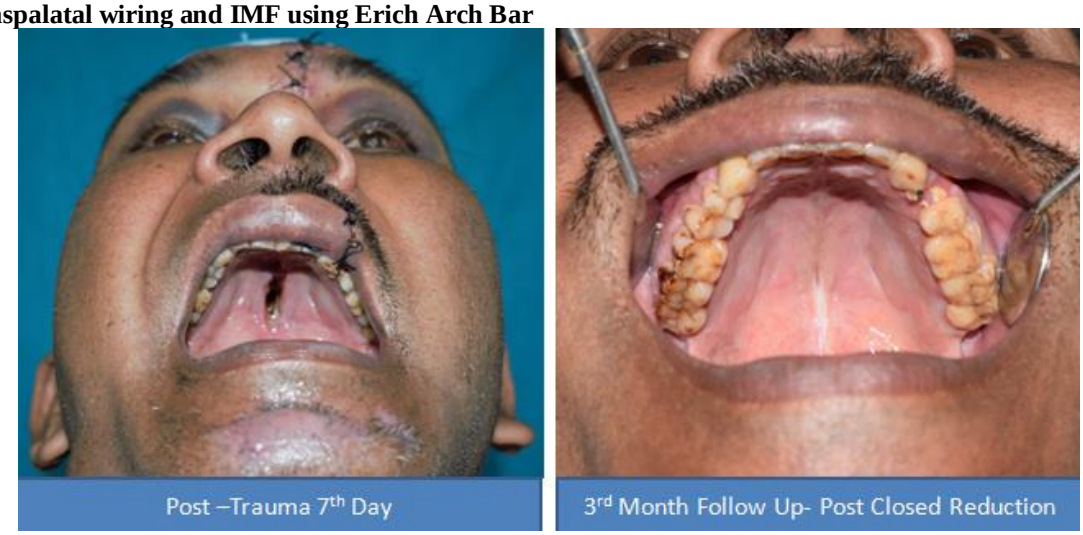
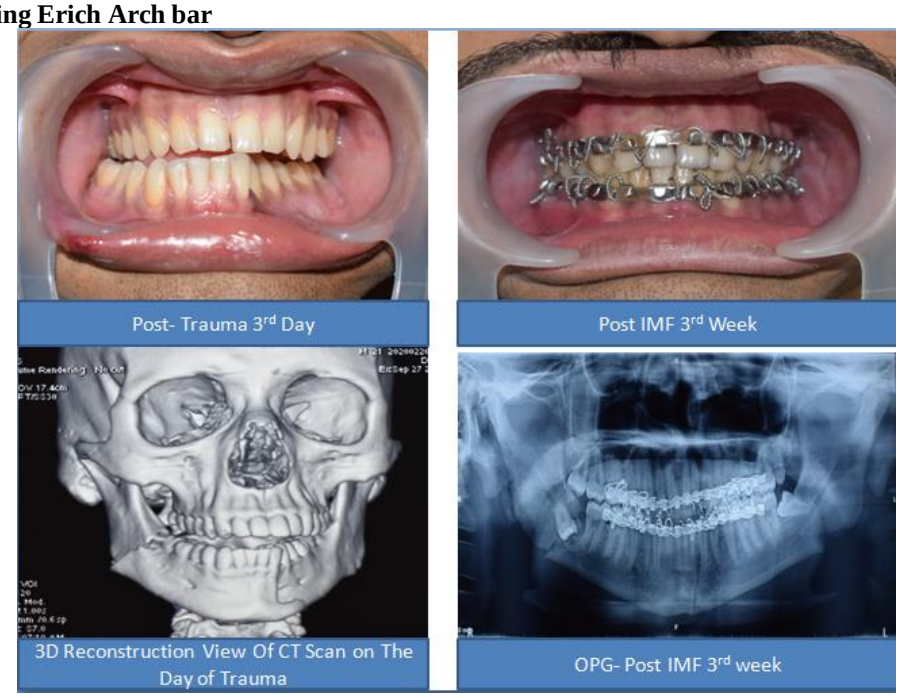


Fig.No. 5 – Fracture Right Angle and Left Parasymphysis of Mandible Managed by Closed reduction with IMF using Erich Arch bar



PROTOCOL

PATIENTS INITIAL SCREENING

Each trauma patient reported was screened initially based on screening format as described in TableNo.1. This procedure is important because the patients with maxillofacial emergencies often have symptoms, such as fever and fatigue, due to acute inflammation. Thus, a first evaluation is essential to accurately identify patients suspicious or at high –risk of COVID-19.

For all 79patients, body temperature was <37°C, and none with cough, sore throat, breathing difficulty, diarrhea, and there was no history of travelling out of the state.

PATIENT'S MANAGEMENT

The patients requiring Intermaxillary fixation, were kept in triage before getting admitted in the ward, and tested for COVID-19 using RT-PCR. Patients who came out to be negative were admitted in the ward, whereas patients who tested out to be COVID-19 positive, were shifted to the isolation ward of nearby medical college isolation centre.

Patients were isolated in a well-ventilated room and had to wear surgical masks. Visitors were limited to one person only with protection measures.Closed reduction was done by 1 consultant and 1 resident using personal protective equipment(PPE): N95, eye protection, face shield, bouffant surgical head cap, fluid resistant single use gown and, surgical gloves.

Patients were kept under observation for 1 day and, discharged the following day. Follow up of patients by telephonic conversation were planned for 1 week, and clinical evaluation on 1 month, 3 months and 6 months were pre-planned on appointment basis. IMF was removed after 4-6 weeks for mandibular and, midface fractures respectively.

DISCUSSION

The SARS-CoV-2 is a β-corona virus, which is an enveloped non-segmented positive-sense RNA virus (subgenus sarbecovirus, Orthocoronavirinae subfamily). Bat is suspected to be the natural host of virus origin. It is quite evident that SARS-CoV-2, could use ACE2, the same receptor as SARS-CoV, to infect humans. The incubation period of this virus ranges from 2 to 14 days, with a mean of 5 or 6 days. The most common symptoms at onset are fever, cough, shortness of breath, and fatigue. Other typical symptoms are rhinorrhea, sneezing, hemoptysis, diarrhea, and abdominal pain. Severe manifestations include severe acute respiratory syndrome (SARS), with peripheral ground-glass opacities in the lungs on chest imaging[5].On March 3rd 2020, WHO reported mortality rate of patients affected by COVID-19 was approximately 3.4% [2].First confirmed case of COVID-19 infection in India was on 30thJanuary 2020, in the state of Kerala, in a person who had a travel history from Wuhan, China. First death due to Coronavirus in India was reported in Karnataka, on 12th March, 2020. Slowly the pandemic spread to various states and union territories, and the first case recorded in the state of Himachal Pradesh was on 20th March 2020, with a progressive increase in the number of the cases thereafter.

The nasopharynx and nose are major reservoirs of the virus. Maxillofacial surgeons, as well as others who perform procedures in the head and neck region, are at high risk of being exposed to and, infected by SARS-CoV2. This necessitates the management of head and neck patients presenting for treatment by development of new protocols to ensure provider, personnel, and patient safety from the virus during that treatment. Majority of countries reacted to the

emergency by decreasing surgical activity with a reduction in elective procedures [4,6.7].

An interesting phenomenon was the variability within countries with one centre was working normally, another in the same country was reducing their activity, as seen in countries like India, Brazil, Pakistan, Turkey, and the USA. The reasons probably stem from the size of these countries, the differences in regional administrations, and the particular characteristics of the virus control efforts [8].

Despite the ongoing COVID-19 pandemic scenario, healthcare specialties cannot ignore the emergency as well as some routine health care services, whereas certain elective procedures can still wait. Maxillofacial surgery is one of such branches where patients cannot be kept deprived of healthcare facilities, thus certain combination of new technology along with older conventional treatment methods can be employed, as new normal for adapting to these times of crisis. As the prevention of progressive spread of COVID-19 is of utmost importance at this stage, therefore, the current approach followed by our department for the management of maxillofacial trauma was to address only emergency treatment. Higher preference was given to conservative treatment using closed reduction under local anesthesia instead of ORIF under general anesthesia that lessened the burden and risk to the anesthetist as well. In few countries like Italy, some centers adopted a telephone triage protocol, patients were then tested with a nasopharyngeal swab, 2 days before admission [6,9]. The ADA and AO-CMF has released guidelines that recommend all elective procedures should be postponed /rescheduled during pandemic till clear management strategies are identified [10,11].

Surgeon has to weigh the risks and benefits of delayed conservative approach to the injury. When intervention is chosen over observation, every effort should be made to: (a) be as expeditious as possible, even if these are not the clinical decisions that would be chosen under more typical circumstances; (b) limit the number of providers involved in patient care; and (c) provide care in the emergency department on an outpatient basis wherever possible. This will reduce the usage of PPE, hospital stay time, number of providers exposed to the patient, and reduce the utilization of critical operating room resources[3].

Most common mode of injury during this pandemic was fall as earlier whereas in few studies domestic accidents has been the main cause of trauma, in contrast with the literature, in which the most frequent causes are road accidents, followed by sports injuries. The reason could be due to the severe restrictions applied during this epidemic period, including the prohibition on travelling from one municipality to another with private or public means, except for work needs, absolute urgency or health reasons. A centre from Brazil reported a peculiarity: Trauma, both due to personal aggression, and motor vehicle accidents had decreased due to social distancing and stay-at-home ordersbut rural population in hilly regions of India, like Himachal Pradesh is dependent for their livelihood on farming, thus, was engaged in normal life activities during this period. Hence, the resultant etiology of trauma in most case is outcome of it. All the patients during this time period were residents of Himachal Pradesh, as tourism was on hold during this time period. Males were more commonly involved, as in this region of India males of age group 21-40 years are most commonly responsible for taking care of the family and go out for work , thus making them more prone for injuries [1,8,12,13].

According to the latest data available, as reported on 11th October,2020, the pandemic affected as many as *7,053,806* lives, caused as many as *1,08,334* deaths in India till now. According to the outbreak of pandemic as majority of countries our centre also focused on emergency treatment only by decreasing the surgical activity with no elective procedure being performed at all. As most of the COVID -19 patients are asymptomatic, many harboring the virus may conceal their flu like symptoms or might be convalescing the disease and daily increase in number of patients has proven that all preventive measures being taken till now are insufficient, thus compromising the safety of health care professional and community as well.

All the patients at our centre were managed conservatively using closed reduction under local anesthesia. As soon as patient arrived in emergency or outpatient department, resident and staff on duty managed to evaluate the patient by proper documentation of history, clinical examination, photographs, and radiographs while keeping a check on unnecessary visits of other staff members whose services were not required. Fractures of maxillofacial region, specially maxilla and mandible need nasal intubation if needed to be managed by ORIF under general anesthesia, which in turn carries high risk to anesthetist also due to aerosolization of virus. Considering COVID-19 virus a new type whose biological behavior, treatment of the pneumonia caused by it are still in the research phase with no available specific therapeutic drug till date, limited availability of resources in the developing nations like India, decreasing the elective procedures, and opting for less time-consuming treatment options would be a great preventive measure to reduce epidemic by unnecessary medical activities. Procedures should be limited to facial fractures, in which a delay in the management could affect the ultimate outcome. Surgeon-specific factors include age >60 years, immunosuppression, cardiac co-morbidities, chronic pulmonary disorder, or multiple other medical co morbidities. Follow-ups for patients whenever possible were performed by video or telephone thereby reducing physical contact, as being followed in other countries of the world. So far we have succeeded in achieving favorable outcomes following closed reduction. Complications like restricted

mandibular movements, delayed return to normal function were the major drawbacks of the conservative treatment, whereas reduced treatment cost, short hospital stay time, undergoing unnecessary surgical interventions emerged as major benefits. This approach helped us to perform our professional, moral and ethical obligations while struggling with unparalleled public health challenges of COVID-19. These patients have been planned for a long time follow up, hence benefits and complications can be studied in detail for the longer run.

Unsafe working conditions, made worse by the lack of PPE, testing capabilities, all leading to high-risk situations for many healthcare workers, and patients in many countries. However, it is admirable that almost every centre did its best to optimally face the outbreak. Apart from all the negative impacts of COVID-19 pandemic, it certainly has emphasized on closed reduction which in a way reduced unnecessary surgical intervention in all cases as was being practiced in modern times. Telehealth initiative has emerged as a good access for health care and is convenient to both the patient and the provider. This great effort from health care community has no precedent in history. Protecting healthcare workers from high-risk infection hazards is vital in ensuring their safety, while delivering care and avoiding a healthcare system collapse. This was our main aim during this time which could be achieved only by keeping the elective procedures on hold, and choosing closed reduction as the treatment option wherever possible and involving minimum contact of staff members with patients, and, adequate protective measures while treating the patients.

CONCLUSION

It seems appropriate to request that every healthcare institution receives well-researched and documented protocols for dealing with future inevitable global pandemics. These should be developed and vetted, by both local and coordinated international healthcare-based organizations. Based on these guidelines, specific and effective specialties could be developed to ensure the safety and well-being of both the providers, and the patients worldwide.

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COMPLIANCE WITH ETHICAL STANDARDS

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

ETHICAL APPROVAL

This study was approved by the research ethics committee of the college.

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