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Trauma in pregnant patient - A case report and review of literature

[1]Neelima Gehlot, Department of oral and maxillofacial surgery, Teerthanker Mahaveer Dental College and Research Center, Moradabad, Uttar Pradesh, India.

[2]D.S Gupta, Department of oral and maxillofacial surgery, Teerthanker Mahaveer Dental College and Research Center, Moradabad, Uttar Pradesh, India.

[3]Subhajit Mitra, Department of oral and maxillofacial surgery, Teerthanker Mahaveer Dental College and Research Center, Moradabad, Uttar Pradesh, India.

[4]Swapnil Mahavir Jain, Department of oral and maxillofacial surgery, Teerthanker Mahaveer Dental College and Research Center, Moradabad, Uttar Pradesh, India.

[5]Flora Kalita, Department of oral and maxillofacial surgery, Teerthanker Mahaveer Dental College and Research Center, Moradabad, Uttar Pradesh, India.

Corresponding Author: Subhajit Mitra, Department of oral and maxillofacial surgery, Teerthanker Mahaveer Dental College and research center, Moradabad, Uttar Pradesh, India.

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Abstract

Maxillofacial trauma during pregnancy is an alarming situation, immediate restitution of form and function is too necessary, as it directly affect the nutrition of mother and the child. Along with that interfering with mastication, breathing and normal mouth opening. Such a gravid situation brings lots of dilemma related to imaging and kind of surgical intervention to be done. A very careful assessment of patient's systemic and gestational status is absolutely necessary along with the foetus, before and after instituting any surgical intervention. We present a case of a 23-year-old female one month old trauma history in her third trimester with HCV reactive. She was treated with open reduction and internal fixation as close reduction in such an gravid condition is never an indication. There was successful restitution of occlusion and facial symmetry.

The patient was followed up at one week two-week one month respectively, which demonstrate restitution of normal mouth opening, function and facial symmetry. The article aims to analyze the principles in management of maxillofacial trauma in pregnant women and tried the clarify the common misconception and complications

Keywords: Trauma, pregnancy, foetus, maxilla, zygomtic bone.

Introduction

Pregnant women with maxillofacial component deserve a special attention, as their treatment and management involve two lives the mother and the foetus. This article aims to clarify various clinical queries regarding: (i) whether to intervene or not, (ii) type of imaging and its

role, (iii) Choice of anesthesis - LA or GA, (iv) conservative or surgical approach. This case report will help us to analyze the various principle regarding treatment of a gravid patient.

Case report

A 23-year-old female patient reported to our Department of Oral and maxillofacial Surgery, with a chief complain of difficulty and pain in chewing since one month. The pain was dull aching in nature which radiates toward the malar which did not subside on medication. The patient was pregnant in her second trimester with HCV reactive. She admitted in ICU for 7 days under dept of neurosurgery as she gives a history of loss of consciousness for 2 hours. Examination of the patient at our center reveals gross facial asymmetry (elevated left malar region), deviated nose on left side. On comparing with pre trauma picture it shows that the upper labial fullness is lost, lower lip is protruded. Mid face appears to be retruded.

The birds and worms view (fig) reveals flattening on the left side compared to the right side, mild deviation of nose towards the left. Extra oral palpation shows mild tenderness present over left FZ region, left infraorbital rim & medial orbital wall, left zygomatic body fracture, left maxillary buttress fracture. No step deformity recorded. Bilateral TMJ joint movements were normal on palpation. Neurosensory examination reveals neuro sensation normal. Intra oral examination shows class 3 molar relation. Mouth opening was 27 mm. On palpation mild tenderness in upper labial and buccal vestibule, no step deformity or segmental mobility present. Based on the above clinical presentation provisional diagnosis of Le fort 1 fracture, left ZMC fracture, left zygomatic arch fracture. 3D CT face demonstrated lefort 1 fracture with bilateral zygomatic complex fracture. Lab investigations (viral markers) further denotes HCV positive patient. Plan of open reduction and fixation was done, aiming at improving the mouth opening, occlusion and facial asymmetry. INTA operatively oral intubation with flexor metallic tube was preferred. Fracture site was anatomically reduced and fixation was done with Lateral eye brow approach was done to expose and reduce the fracture segment at F-Z suture region. Fixation done with 2 holes with gap mini plate(1.5mm). Pre auricular incision was given on the left side, fracture site at left zmc region was exposed and reduced. Fixation done with 2 holes with gap. 2 L mini plate (1.5mm) was used for fixation of left maxillary buttress region.2 hole with gap mini plate (1.5 mm) was used for fixation of right maxillary buttress region. Extra oral closure was done with 3-0 vicryl, and sub cuticular skin closure with 4-0 prolene. Intra oral closure with 3-0 Mer silk. Post operatively reference has been sought in view of fetal well-being and maternal status. The patient was then reviewed after 3 days, 7 days, during which she demonstrated restitution of her normal occlusion, mouth opening and improved facial asymmetry.

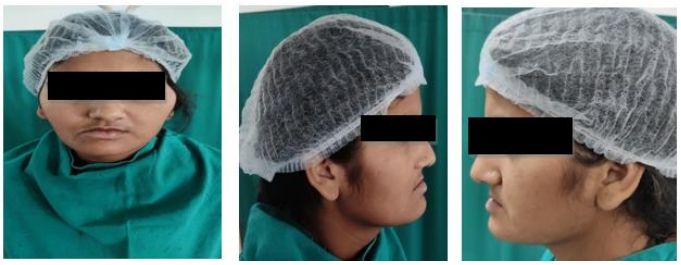


Fig 1: Pre –operative pictures

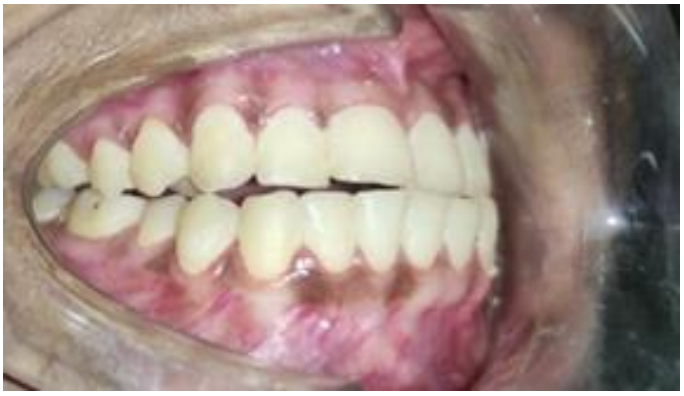


Fig 2: Pre operative occlusion pictures

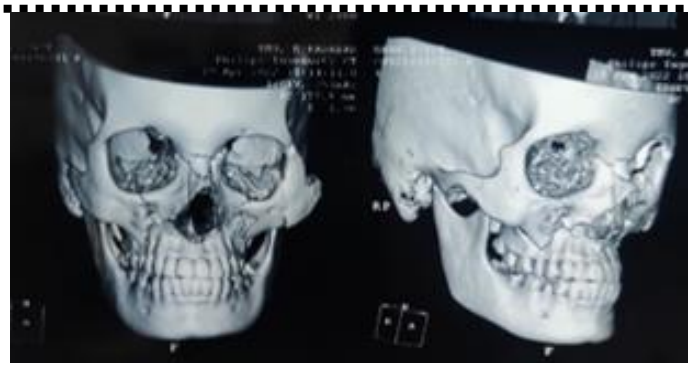


Fig 3: Pre-Operative CT

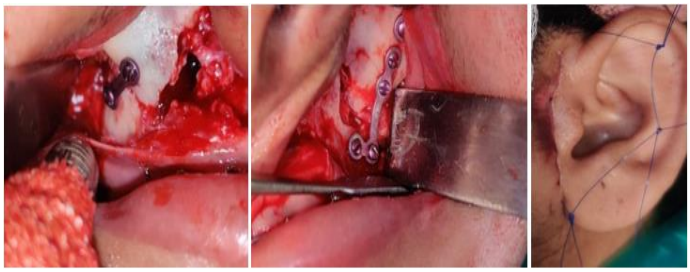
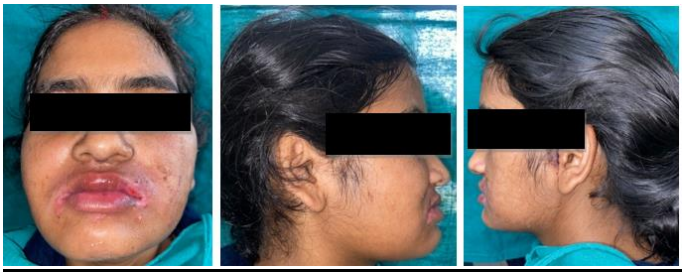


Fig 4: Intra operative pics



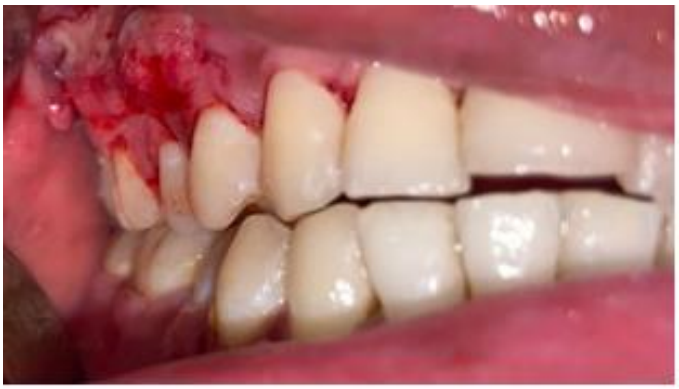


Fig 5: Post operative pics

Discussion

Various doubts were put up regarding investigation, surgical management and anaesthesia in the maxillofacial injuries management in pregnant females. The first step of fracture management is to evaluate the trauma imaging. If a pregnant female comes only with maxillofacial trauma even then the aim is to look after the injury site and to make sure that the foetus is safe.[3] even its compulsory to observe the abdomen's internal organ. The clinical inference of declaration is described by Aramanadka et al .[4] The study reveals the physiologic changes of internal organs in pregnant female which make them more susceptible to injuries. Head CT or Chest CT should be carried out on pregnant females without terror of radiation which affects the embryo .[5]

For General anaesthesia, 2nd trimester is best suited as in 1st and 3rd trimester foetal injury can take place due to an aesthetic anoxia .[6] Drugs used in GA can give rise to teratogenicity and abortion in 1st trimester .[7] For non-obstetric cases appropriate guidelines came for managing the cases of maxillofacial trauma - (1) Whenever indicated, non - obstetric surgical management under GA can be done in a pregnant woman. (2) Till Postpartum, all the elective procedures have to put on hold. (3) To carry out any essential surgery, The trimesters play a major role in it. (4) With the help of multidisciplinary approach, all urgent surgeries are done and while performing a surgery uterine and foetal monitoring are important. (5) In case of maternal cardiac pulmonary arrest, a Caesarean section should be performed within 4 mins according to 4 min rule.[8]

If a pregnant female gets post traumatic cardiac arrest, a Caesarean section should be done to deliver a foetus. Throughout 1st and 3rd trimester, possible course of action for any surgical treatment is local anaesthesia. Patient with associated systemic diseases like Christmas disease or Von Willebrand's disease, Local anaesthesia is contraindicated .[6] According to Donaldson et al, no foetal toxicity is seen even if the dose is above the maximum recommended dose. [9]

Type of LA agent which is safe for pregnancy is categorized in pregnancy risk category B. Lignocaine

which falls under category B of food and drug administration is considered safe in pregnancy for all the trimesters .[11] LA used in obstetric field is Bupivacaine, which has low foetal to maternal ration and doesn't even cross the placental barrier like lignocaine does [12], and bupivacaine comes under C category. High dose of bupivacaine can cause cardiac arrest and hence is not recommended in pregnant females .[13] In a pregnant female maximum dose of 2% lignocaine with 1:100,000 epinephrine is 4.4 mg/kg whereas in non - pregnant females the dose is 7.7 mg/kg .[10] In 1st trimester, use of nitrous oxide sedation should not be given .[14] Epinephrine is better vasoconstrictor than levonordefrin as seen from foetal aspect .[10]

In 10% of pregnant females signs of shock are seen in 3rd trimester .[15] Pregnant female should be positioned and should be given a 15 tilt and a wedge should be placed Unger their right hip (left lateral decubitus position) in the 2nd and 3rd trimester. To manage the supine hypotension syndrome, manual displacement of uterus is done .[16]

Due to limited use of aesthetic agents conservative management is favored more for treatment of maxillofacial trauma in pregnant females. Conservative management is considered because of the ill effects of surgical procedures on patient .[4]

Some authors say ORIF under LA is better .[17] As in conservative management, Inter-maxillary Fixation is done for the treatment of fracture ,[17,18] but it can still interrupt the anatomic reduction, and can even disturb the masticatory function which could affect the nutrition of mother and the foetus.

Under GA, only some cases are managed and according to Zhang et al,[13] case of superiorly dislocated condyle with Para symphysis fracture is done in ORIF under GA. Pre-auricular and vest alar incision were given to fix the condyle as well as the Para symphysis fracture with the help of mini plates. Neff et al, published a paper and stated that out of 46.3%, only 45.5% of experts have suggested that internal fixation is goof for a pregnant female in 2nd trimester, instead of maxillo - mandibular fixation .[18] Rigid fixation of maxillofacial fractures are advised because it provides good nutrition to both mother and the foetus and even keep away the aspiration risk. As pregnant female, are on greater risk of regurgitation as they have reduced tone of lower esophageal sphincter .[10]

Maxillofacial surgeon, neurologist, obstetrician, orthopaedic surgeon, pediatric surgeon, anaesthetist and radiologist all are involved in a multidisciplinary approach done for management of craniofacial trauma in a pregnant female. Type of anaesthesia doesn't matter (LA or GA) if the pregnant women is in her late 2nd or 3rd trimester, what matters is if the delivery is expected then it should be supervised by a senior obstetric surgeon, paediatrician and an aesthetic while performing a maxillofacial surgery .[22,16]

For a pregnant female, the trauma life support order is, (1) Patient's ideal positioning

(2) primary surveying (3) foetal status evaluation (4) secondary surveying (5) management should be conclusive .[29] Caesarean section should be performed in feasible pregnancy and if mother goes into cardiac arrest, then resuscitate the mother and foetus should be saved.[3,19]

Direct and indirect trauma can lead to risk on foetal life and so evaluation of foetus is very important. Pinard stethoscope or a hand held doppler can be used to measure foetal heart rate.To keep an eye on uterine activity, it should be measured by cardiotocography .[16]

Some abnormalities common in pregnant females are Leucocytosis, increased fibrin, Alkaline phosphate value increased, partial pressure of CO2 decreased, and decreased serum creatinine, and D-Dimer is also seen .[3]

Analgesic which is universally accepted to give to pregnant female is Acetaminophen, this drug comes under B category and is labelled safe for pregnant females .[10] Other NSAID drugs are not given due to their inhibitory effect on prostaglandin synthesis .[10]

Steroids, If administered during pregnancies they are considered to be the safest. In neonatal morbidity reduction, corticosteroids play a vital role.

Category B antibiotics can be given to a pregnant female with no systemic complications. When Prescribed in 2nd and 3rd trimester, higher dose of Penicillin V, Amoxicillin and Amoxicillin with Clavulanic acid are given .[3]

Pregnancy doesn't make any difference on the pharmacokinetics of Cephalexin and Clindamycin .[3] Less foetal abnormality is observed even in administration of Metronidazole .[20]

For traffic safety, the seatbelt should be positioned properly, meaning it should prevent the uterus rupturing and foetal death. Deactivate all the airbags and if not then at least 10-inch distance should be maintained between pregnant female and the airbag. [21]

Conclusion

A very less literature has been found regarding the controversies whether to go for an open reduction internal fixation or closed management in maxillofacial trauma in a pregnant woman. The main objective of the treatment should be well-being of the mother and the foetus. Functional rehabilitation is very important as breathing and mastication will directly influence the nutritional status of the foetus. So, more research paper with adequate sample size is needed to understand such a situation better and a standard can be set for such gravid situation.

This case report helps to understand a bit more regarding open reduction and internal fixation.

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