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# Gun Shot Injury Face- A Suicidal Attempt

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***Abstract:*** *Gunshot & Blast injuries usually produce complex wounds; and those involving face include even more complexities which then requires a team of highly skilled specialists to treat.*
*A 15 years old boy was brought to the hospital with massive bleeding from the mouth and face following a suicidal shot with rifle placed under the chin.He needed immediate intervention to control the bleeding and secure the airway. In response to that, Emergency Tracheostomy and primary closure with haemostasis was done in OT . Due to extensive damage to the face, delayed surgical reconstruction was also required which had to be staged over a period of 3-4 months.*
***Keywords:*** *Gunshot, Tracheostomy, Haemostasis, Reconstruction.*

## I. Introduction

Facial injuries or maxillofacial trauma may involve soft tissue ,facial skeleton and special sensory organs like eyes, nose, ears ,tongue etc.
These injuries are categorized depending upon the causes:-
1. Motor vehicle accidents
2. Fall
3. Assaults
4. Sports
5. War injuries
6. Animal attacks
7. Industrial accidents

Gunshot injuries can be placed under war injuries or civilian. Civilian may be again homicidal or suicidal.Suicidal injuries to the face produce
very complex wounds which need multiple surgical specialists for different tissue management at the same time or one after other .

The face is defined as the area between both external auditory meatus, horizontally; as well as from top of the forehead to chin, vertically.
There are three zones:-
1. Chin to base of nose
2. Base of nose to eyebrows
3. Above the eyebrows

The type of tissue varies in these zones and so the control and treatment also varies accordingly. In facial injuries, the final outcome is directly dependent on early proper care as in the treatment of severe other injuries.

The mechanism of injury in gunshot cases is due to the explosive powder in bullets which throws the end projectile elements out, striking at the speed of 1500 meter/sec. however, this depends upon ammunition, type of gun, type of bullets; and its velocity, mass and also the distance .The damage or death occurs according to the placement and the path ;Head & chest are most vulnerable areas as they are the most vital part of body.
The management depends on severity and tissue damage .The first and foremost action should be taken to secure airway and breathing. Control of the bleeding should be the most important and must be taken care of as this may be the main cause of airway obstruction. The broken mandible &its bony pieces may also obstruct the passage. The injured tongue which lacks voluntary control may fall back in the pharynx to block the airway. Urgent endotracheal intubation or tracheostomy has to be done followed by detection and removal of impacted bullet or broken piece or pieces of bone. Radiological confirmation directs the further surgical approach, x ray,CT scan or MRI help to decide the further action.

Laboratory investigations are also done to know the general status of the patient &amount of blood loss, so as to figure out the required amount of blood for the transfusion.

## II. Case Report

A 15 years old boy, came to the casualty, with profuse bleeding from face & mouth.He was fully conscious but unable to lie down as blood was flowing back into air passage .There was history of suicidal attempt by a gun keeping under the chin. History was given by his father and brother who brought himto the hospital. Patient was immediately shifted to operation theatre and was intubated, which was very difficult because of presence of the continuous flow of blood and severely damaged tissues. Tracheostomy was performed and under anaesthesia complete examination was done, as well as haemostasis was achieved. An extensive loss of tissue was noted including the anterior half of mandible & alveolus, floor of mouth,anterior half of tongue, complete lower lip, left half of upper lip, anterior part of upper jaw & premaxilla, hard palate, floor &lateral wall of nose and part of left maxilla. Debridement of wound with haemostasis and repair of tongue was done in first stage.Ryle's Tube inserted, blood transfusion was started. As the loss was severe further repair &reconstruction was planned afterwards in next stages.

[fig.1&2 , showing the wound left and right side respectively. Please note the site of entry of bullet under the chin]

[Fig 3 one week after the initial repair]

Two to three weeks after the initial primary management next step was planned. A PMMC(pectoralis major myo-cutaneous)flap was taken from left side chest wall. This flap was sutured to the defect over the floor of mouth and ventral surface of the tongue covering and extending upto chin. Still the boy was unable to close mouth and Ryle's Tube feeding was continued.

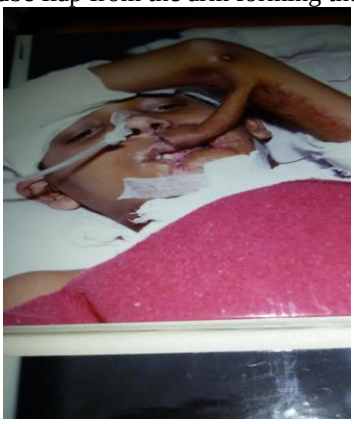
[Fig 4&5 – PMMC flap over chin and chest wall; stitches are in healing state]

In next stage; (after 4 weeks)we took the left arm to raise skin and made a tube flap for lip reconstruction (as discussed with the plastic surgeon and with his directions) which was thought to be the best suitable flap to form the appropriate shape of the lip . This flap takes 3-4 weeks to take up at recipient site.Donor site was covered with STSG
(split thickness skin graft).

[Fig 6 showing the tube flap at arm]

After 4 weeks the upper end of tube flap is cut to stitch it to the mouth at the upper lip region and also to the floor of nose. Again after 4 weeks, when the flap is taken up at the recipient site, it was separated completely from the donor site and stitched to the lower lip area, this way it could close the mouth completely.
At this point closure of mouth was achieved with the formation of both the lips, tongue, floor of mouth and base of nose; thus, Ryle's tube was removed. [Though the position of arm keeping constantly over the forehead is not comfortable for the patient]

[Fig:-7, showing the tube flap from the arm forming the lip and base of nose]



[Fig:-8, showing the formation of the lower lip with the remaining tube flap, detached from the donor site]

In Next stage Anguloplasty , that means formation of angle of mouth left side by cutting & suturing the edges , was done, and at the same time removal of skin folds and adhesions were done to give appropriate shape to the mouth. At this stage patient was quite happy as he was able to take meals and could talk and sit freely with family. Few month later, his jaw was also reconstructed by taking bony graft from iliac crest.

[Fig 9, showing starting healing of tissues and shape of face after the procedure was completed]

## III. Discussion

Peace time gunshot injuries may occur in different situations like social crimes or terrorism or assault or homicidal. Other unintended firearm accidents are to attempt suicides .There are many social and personal problems causing psychiatric conditions like Depression leading to suicidal tendency .Mechanism of injury in all cases of gunshot is due to throwing of end projectile elements from the explosive powder in bullets on striking at very high speed of 1500 meter/sec. Pattern of injury depends on range of arm –close contact, intermediate range and distant range. Other factors affecting the tissue damage are-

1. Firing distance
2. Length & diameter of the firearm barrel
3. Characteristics of gun powder
4. Angle between fire arm barrel and target
5. Characteristics of cartridge
6. The environment ;moisture, wind & heat
7. Type of clothing
8. Intermediate target
9. Characteristics of target tissue.

The management depends on severity of injury -immediate & delayed treatment like Airway and Breathing is taken care first, then control of bleeding, followed by radiological investigations like CT scan, MRI &USG to know the exact extent of bony and soft tissue damage including neurological trauma .The bony and cartilaginous framework of the face supports the soft tissue & teeth and provides attachment to the muscles of facial expression and mastication. The character in the face, the emotional expression and the functions of chewing & eating depend upon a normal anatomical and functional relationship between these structures. These all are managed later on therefore it is called delayed management. The complicated bony, vascular and nervous

anatomy of face makes the management of facial gunshot wounds very challenging. There are structures which are important cosmetically and functionally requiring the treatment accuracy therefore carefully planned surgical correction by all of the specialists is mandatory.

Gunshots are quite uncommon in young children especially suicidal attempts. But when they happen, being unprofessional they escape death but always associated with functional and aesthetic deformities. These lead to so many social as well as mental problems and prolonged & expensive hospital stay and lot of post treatment psychiatric sittings.

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