



## MANAGEMENT OF ACQUIRED SOFT TISSUE DEFECTS OF FACE

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**(ABSTRACT)** **Background:** Since time immemorial, soft-tissue defects of face due to injuries have been documented in literature and even depicted in sculptures, reflecting the image of society. Facial injuries themselves are rarely life-threatening, but are indicators of the energy of injury. Soft-tissue defects of the face can arise out of various causes which may include simple or complex contused lacerations with loss of tissue, avulsions, bites and burns. Common etiologies are road traffic accidents, foreign bodies, defects secondary to tumor excision, homicidal trauma, thermal, chemical and electrical burn, suicidal injuries, human bites, animal bites, gunshot injuries and blast injuries. The management of acquired soft tissue defects of face requires precise planning and coverage by a modality which is functionally and aesthetically pleasant.

**Objectives:** To study the epidemiology of acquired soft tissue defects of face. To restore the aesthetics of the face by resorting to appropriate modality of reconstruction.

**Materials & Methods:** This study was conducted in the Department of Surgery, Govt. Medical College Jammu, J&K, India and included 40 patients having been diagnosed with acquired soft-tissue defects of the face admitted in surgery ward from November 2018 to October 2019 (Prospective study). All the defects were evaluated for size, depth, and status of the base of the defect (presence of gross contamination or infection, integrity, and viability of the wound edges) along with evaluation and documentation of cranial nerve function, particularly the facial and trigeminal nerves. The management depended upon the defect site, size, status and type. 52.5 % patients underwent flap coverage whereas 22.5% underwent skin grafting for coverage of defects. 25% of the patients underwent primary closure of the facial defects.

**Results:** Majority of the patients had restoration of anatomy and normal function after reconstructive procedures with colour and contour matching of that of the recipient site. No major complication was encountered in any of the patients.

**Conclusion:** Acquired soft tissue defects of the face can be reconstructed by a variety of modalities which should not only be functionally adequate but also aesthetically appealing. Flaps are a versatile modality of reconstruction with the choice of flap being governed by the site and size of the defect.

**KEYWORDS :** Acquired soft tissue defects of face, reconstruction of defects.

### BACKGROUND

The management of soft tissue injury after facial trauma poses unique challenges to the surgeon, given the specialized nature of facial tissue and the aesthetic importance of face. The general principles of trauma management and wound care are applied in all cases.<sup>1</sup>

Although rarely life threatening, the treatment of these injuries can be complex and may have significant impact on patient's facial function and aesthetics.<sup>2</sup> Lacerations to the face and scalp account for approximately 50% of the wounds treated in the emergency department.<sup>3</sup> Lacerations and contusions involving face are most common in children and the elderly.<sup>4,5</sup> Facial burns can lead to soft tissue defects of the face needing coverage.<sup>6</sup> Animal bites can lead to grotesque facial deformity owing to subtle loss of facial tissue.<sup>7</sup> Human bites in maxillofacial region are as serious as animal bites and can lead to complex defects over the face.<sup>8</sup> Road traffic accidents, assault, gunshot wounds contribute to the soft tissue defects of the face needing reconstruction.<sup>9</sup> Resection of various skin malignancies involving face result in a variety of soft tissue defects needing reconstruction.<sup>10</sup>

In the present study, an attempt has been made to describe in detail the management of patients with acquired soft tissue defects of face. The evaluation of various reconstructive modalities for coverage of the soft tissue defects arising out of various etiologies has been made.

### MATERIALS AND METHODS

This study is done on 40 patients having being diagnosed with acquired soft tissue defects of face requiring reconstruction, admitted in Post Graduate Department of Surgery, Government Medical College, Jammu(J&K). The patients were studied prospectively, personal and demographic data of the patients was noted.

In the hospitalized patients, a detailed history including the timing, mechanism of injury and any post injury signs and symptoms of associated cranial injury (nausea, vomiting, loss of consciousness) was obtained.

All the defects were evaluated for size, depth, and status of the base of

the defect (presence of gross contamination or infection, integrity, and viability of the wound edges). All the patients underwent pre-operative investigations for requisite anaesthesia.

The defect was then suitably covered by either skin graft or flap. Primary closure of the wounds was achieved in 25% of the patients. Flap division and inset if required was done after interval of three weeks. Patients were followed-up periodically in the post-operative period.

### Inclusion Criteria

Soft tissue defects of face sustained due to road traffic accidents, foreign bodies, secondary to tumor excision, homicidal trauma, suicidal or self-inflicted injuries, Thermal, chemical and electrical burn, human bites, animal bites or mauls, gunshot injuries.

### Exclusion Criteria

Congenital soft tissue defects of face.

### RESULTS

**Table 1- Age Distribution Of Patients**

AGE GROUP	NO. OF PATIENTS	PERCENTAGE (%)
<10 years	7	17.5
11-20 years	4	10
21-30 years	7	17.5
31-40 years	3	7.5
41-50 years	9	22.5
51-60 years	10	25
Total	40	100

Maximum number of patients were in the age group of 51- 60 years (25%) followed by 41- 50 years of age (22.5 %). The average age of the patients was 32.6 years. The youngest patient in the study was 6 months old whereas the oldest patient was 60 years old.

Out of the 40 patients 29 (72.5%) were male and 11(27.5%) were female making a male: female ratio of about 2.6:1. Out of all the

patients, majority were residents of rural areas (62.5%).

Maximum patients requiring coverage for soft tissue defects of face were either labourers or farmers (32.5%), followed by children (27.5%).

**Table 2- Causes Of Defect**

CAUSE	No. OF PATIENTS	PERCENTAGE
Animal bites	13	32.5%
• Crow bite	1	2.5%
• Dog bite	11	27.5%
• Camel bite	1	2.5%
Post tumour excision	12	30%
Trauma	9	22.5%
Bear maul	3	7.5%
Human bites	2	5%
Electric burn	1	2.5%
Total	40	100%

Animal bites accounted for 32.5% of the defects out of which 27.5% were dog bites whereas defects arising out of the excision of tumor accounted for 30% of the cases.

**Table 3- Site Distribution Of Defect**

SITE	NUMBER OF PATIENTS	PERCENTAGE (%)
Degloving Injury	1	2.5%
Forehead	4	10%
Eyelid/eye	3	7.5%
Nose	12	30%
Cheek	14	35%
Lip	4	10%
Ear	2	5%
TOTAL	40	100

Cheek was the most common site of defect (35%) in our study followed by nose (30%).

Flaps were the most common modality of coverage (52.5%) of the soft tissue defects of face followed skin grafting (22.5%). Primary closure of the wound was achieved in 25% of the cases.

**Table 4- Type Of Flap**

TYPE OF FLAP	NUMBER OF PATIENTS	PERCENTAGE (%)
FOREHEAD FLAP	8	20
FRICKE'S FLAP	2	5
SUPERFICIAL TEMPORAL A. FLAP	2	5
ESTLANDER'S FLAP	4	10
TAGLIACOZZI FLAP	1	2.5
RETROAURICULAR FLAP	2	5
CHEEK ROTATION FLAP	1	2.5
CHEEK ADVANCEMENT FLAP	1	2.5
TOTAL	21	52.5

Forehead flap was the most common modality of coverage (20%) followed by Estlander's flap (10%).

Patients requiring skin graft as a modality of coverage took 2 weeks to recover whilst the recovery period was 4 weeks in the patients undergoing flap coverage as a reconstructive modality.

No major complication was noted in any of the patients. There was 1 case of partial graft loss as a complication of split thickness skin grafting. 2 instances of hair growth at the recipient site were observed with the usage of forehead flap due to extension of the flap into the hair bearing area of the scalp due to requirement of additional length of the flap.

**DISCUSSION**

Facial soft tissue defects can be one of the most challenging cases presenting to the surgeon. Immediate reconstruction of most defects leads to better restoration of form and function as well as rehabilitation. In our study, 40 cases of soft tissue defects were included. Maximum number of patients were in the age group of 51- 60 years which

accounted for 25% of all the patients. The average age of the patients was 32.6 years. The youngest patient in the study was 6 months old whereas the oldest patient was 60 years old. The relationship between age and soft-tissue defects of face owing to various reasons has been established in studies by other authors.<sup>11,12,13</sup> The males outnumbered females in our study group and contributed for 72.5% of the cases. This finding goes well with other study groups.<sup>12,13,14,15</sup>

In our study, animal bites constituted the majority of cases and accounted for 13 cases (32.5%) of the study group. Dog bite accounted for 11 cases (27.5%) with 1 each case of crow bite and camel bite (2.5%). The post tumour excision facial defects needing reconstruction constituted 12 cases (30%). Trauma related soft tissue defects constituted 9 cases (22.5%). The number of bear maul cases included in the study were 3 (7.5%), human bite cases 2 (5%) and electric burn leading to soft tissue defects of face was observed in 1 case. Various etiologies for soft tissue defects of face have been put forward in studies of various authors.<sup>8,9,13,16</sup>

In our study most of the patients were residents of rural area; 62.5% cases. This finding goes well with other study groups.<sup>14,17,18</sup>

In the study entailed, labourers/farmers accounted for 13 cases (32.5%); in service patients accounted for 10 cases (25%); housewives and school going children accounted for 6 cases each (15%), whereas children <5 years of age staying at home contributed to rest of the cases (12.5%). Relationship between occupation and facial soft tissue defects has been noted in the studies carried out by other authors.<sup>17,19,20</sup>

In our study, cheek was the most common site of soft tissue facial defect due to injury accounting for 14 cases (35%); nose was involved in 12 cases (30%); forehead and lip defects contributing to 4 cases each (10%); eyelid defects were observed in 3 cases (7.5%) ear defects accounted for 2 cases (5%) whereas degloving injury of face accounted for 1 case. The site of the soft tissue defects of face arising out of various etiologies has been studied by other authors too.<sup>8,16,21,22,23</sup>

Out of total 40 cases of soft tissue facial defects, primary closure of the soft tissue defects on the face was done in 10 cases (25%), skin grafting was the modality of coverage in 9 cases (22.5%) whereas flap coverage was required in 21 cases (52.5%). The role of various coverage modalities for soft tissue defects of face has been established in other studies too.<sup>9,11,23,24</sup>

In our study Forehead flap was the most common modality of coverage used (20%), followed by Estlander's flap (10%). 2 cases each of Fricke's flap, superficial temporal artery flap, and retro auricular flap were done (5% each). In rest of the 3 patients having soft tissue defects of face, Tagliacozzi, cheek rotation and cheek advancement flaps were performed in one case each (2.5%). Various authors in their studies have utilized a variety of flaps for coverage of soft tissue defects of the face.<sup>25,26,27,28,29</sup>

None of the patients had any major complications arising out of the reconstructive modality.

**CONCLUSION**

In conclusion, soft tissue injuries and defects are among the most common cranio-facial injuries encountered by emergency department personnel and plastic surgeons. These injuries account for nearly 10% of all emergency department visits. The reconstruction requires meticulous assessment of the defect so that the reconstructed part is aesthetically and functionally acceptable. A variety of reconstruction modalities in form of various procedures such as primary closure, split thickness skin grafting, full thickness skin grafting, flap coverage are available.



**Plate 1 - Soft Tissue Defect Of Nose Post Basal Cell Carcinoma**

### Excision With Raised Left Paramedian Forehead Flap Followed By Flap Inset



**PLATE 2 – (Clockwise from left to right) Electric burn of face followed by defect post-debridement followed by Right Tagliacozzi flap coverage and 1 month after flap inset.**



**PLATE 3 – (Clockwise from left) Carcinoma lower lip with defect post-excision followed by marking and raising of Estlander's Flap and flap inset. Bottom Right – 6 months post-op**

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