

# A Study of Human Bite Injuries to the Face

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## Abstract

**Introduction:** Human bites of the face present to the surgeon sometimes with a dilemma as to the method and timing of surgery. Often patients present with soft tissue defects as a result of the injury sustained. Reconstruction, therefore, becomes absolutely necessary to avoid psychosocial complications.

**Aim:** To analyze human bites injuries of the face and management of these wounds.

**Materials and Methods:** All patients who had human bites of the ear lip and nose accounting to about 39 cases were included in the study. The methods included obtaining a thorough history from the patients, thorough clinical examination and necessary investigations with appropriate surgical reconstruction.

**Results:** A total of 39 cases were included in the study, the most common site of injury was the ear accounting to about 67%, and primary reconstruction was done in about 15 (88%) cases in the trauma theatre. Secondary reconstruction was done in 2 (12%) cases in elective operation theatre.

**Conclusion:** Human bites are potentially dangerous wounds and constitute a significant cause of morbidity. Emergency physicians should be well acquainted with the evaluation and proper management of human bites to avoid complications.

**Key words:** Human bites, Management, Reconstruction surgery

## INTRODUCTION

The true incidence of human bite injuries is difficult to estimate because the vast majority probably go unreported and do not seek medical attention. Of those reported, approximately 60% occur in the upper extremities, while another 15% occur in the head and neck region. The remainder occurs on the breasts, genitals, thighs, and other areas. Upper extremity bites most frequently occur on the dominant extremity. Head and neck injuries most commonly occur on the ears, nose, or lips.<sup>1,2</sup> Human bites of the face present to the surgeon sometimes with a dilemma as to the method and timing of surgery. Often patients present with soft tissue defects as a result of the injury sustained.

Reconstruction, therefore, becomes absolutely necessary to avoid psychosocial complications.<sup>3</sup> In the US, human bites are the third most common next to dog and cat bites.<sup>4</sup> People behave barbarically out of rage and go to this extreme of biting fellow human beings. Most of the bites have taken place under the influence of alcohol.<sup>5</sup> Illiteracy is one of the major contributing factors for human bites. The most common bites were on the ear, the lip and the nose in that order. One of the main reasons for human bites is quarrel among family members.<sup>6</sup> Ear loss whether total or partial leads to a lot of social stigmas and the victim camouflages the defect in public places. Lower lip defects can compromise the function of the oral sphincter. Nasal defects are easily noticeable, and the victims find it very difficult to socialize because of the nasal defect. We have discussed the various options available for the reconstruction of the ear, lip and nose defects. There is no specific classification available for human bites so far except for region wise classification.<sup>7</sup>

## Aim

To analyze human bites injuries of the face and management of these wounds

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## MATERIALS AND METHODS

This prospective observational study was conducted in the Department of Plastic and Reconstructive Surgery, Government Rajaji Hospital, Madurai Medical College, Madurai. The patients with a history of human bites to the face who were admitted to the emergency ward were included in the study. All patients who had human bites of the ear, lip, and nose were included in the study. The methods included obtaining a thorough history from the patients, thorough clinical examination and necessary investigations with appropriate surgical reconstruction. Proper pre-operative planning was done. Pattern and template were made as per tissue loss. Immediately after admission, patients were given anti-tetanus prophylaxis. Wound swab was taken for culture and sensitivity. Thorough wound wash was given using Betadine, hydrogen peroxide, and saline. A course of antibiotics was started with injection Cefotaxime 1 g intravenous (IV) bd, injection Ampicillin 1 g IV bd, and injection Metronidazole 500 mg IV TDS for as long as the patient stayed in the hospital after which oral antibiotics was given to a total period of 5 days. In stable patients primary single staged repair was done or the first stage of staged reconstruction was done on the day of injury. In patients with associated injuries priority was given to life saving measures followed by secondary reconstruction. Procedures, outcomes, and complications were explained to the patients and informed written consent was obtained from all patients. Cases were followed up after 1 and 2 weeks then monthly for at least 3 months after the final stage of reconstruction.

## RESULTS

A thorough examination of the bite wound in adequate lighting must be performed. The wound may be irrigated to facilitate the examination. The extent of damage to the soft tissue, depth of the bite, involvement of tendons, presence of infection or foreign bodies such as fragments of teeth must be assessed. Special care must be taken during the examination of fight bites, and examination must be performed in the closed fist position so as to passively flex the fingers, making it easier to assess the damage to the extensor tendons.

The data show that about 74% ( $N = 28$ ) of injured belonged to 21-40 years. 21% ( $N = 9$ ) of the patients belonged to 41-60 years age group. Only 5% ( $N = 2$ ) of the cases were <20 years. About 95% ( $N = 37$ ) of the patients were males. Only 5% ( $N = 2$ ) were females (Table 1).

About 44% ( $N = 17$ ) of the patients had completed their middle school education, and 33% ( $N = 13$ ) of them had

completed primary education. About 13% ( $N = 5$ ) of them were illiterate. Only about 5% ( $N = 2$ ) of the victims had completed secondary school education and graduation (Table 2).

The daily wages group had there were 92% ( $N = 36$ ), and 8% ( $N = 3$ ) of the patients were monthly salary group. About 32% ( $N = 13$ ) of the victims were under the influence of alcohol at the time of injury. As per the history obtained from the victims, about 74% ( $N = 29$ ) of the assailants were under the influence of alcohol at the time of injury.

The most common site of injury was the ear accounting to about 67% ( $N = 26$ ) followed by a lip in about 18% ( $N = 7$ ) of the cases. Nose was injured in 11 % ( $N = 4$ ) of the cases. Chin was injured in one patient, and only the Cheek was injured in another patient (Table 3).

The average hospital stay for the reconstruction of ear defects was 4.4 days. The average hospital stay for nose defects was 5 days and that for lip defects was 3.1 days. The hospital stays for Chin and Cheek injuries was 1.5 days (Table 4). The right side of the ear was involved

**Table 1: Age incidence**

| Age in years | N (%)   |
|--------------|---------|
| ≤20          | 2 (5)   |
| 21-40        | 28 (74) |
| 41-60        | 9 (21)  |

**Table 2: Literacy status**

| Literacy   | N (%)   |
|------------|---------|
| Illiterate | 5 (13)  |
| Primary    | 13 (33) |
| Middle     | 17 (44) |
| Secondary  | 2 (5)   |
| Graduate   | 2 (5)   |

**Table 3: Region of bite**

| Region of bite | N (%)   |
|----------------|---------|
| Ear            | 26 (67) |
| Lip            | 7 (18)  |
| Nose           | 4 (11)  |
| Chin           | 1 (2)   |
| Cheek          | 1 (2)   |

**Table 4: Average hospital stay**

| Region          | Number of days |
|-----------------|----------------|
| Ear             | 4.4            |
| Nose            | 5              |
| Lip             | 3.1            |
| Chin, and cheek | 1.5            |

in 14 patients, and the left side was involved in 12 patients. Middle third and lower third defects were present in 7 (27%) cases each. About 6 patients (23%) presented with the upper third defects and 4 (15%) patients presented with upper 2/3<sup>rd</sup> defects. Two patients presented with the lower 2/3<sup>rd</sup> defects.

Primary reconstruction was done in about 15 (88%) cases in the trauma theatre. Secondary reconstruction was done in 2 (12%) cases in elective operation theatre (Table 5).

Superiorly based postauricular (PA) skin flap with cartilage implantation was done in 12% ( $N = 2$ ) of the cases with the upper third defects. Superiorly based PA flap was done in 6% ( $N = 1$ ) of the cases in the upper third defect and inferiorly based PA flap was done in 6% ( $N = 1$ ) of the cases with the lower and middle third defect. Converse tunnel procedure was done in 12% ( $N = 2$ ) of the cases with the upper and middle third defects. Dieffenbach procedure was done in 12% ( $N = 2$ ) of the cases for the middle third defect. PA bipediced flap was done in 6% ( $n=1$ ) of the cases for middle third defect. Skin graft was done in 12% ( $N = 2$ ) of the cases for partial thickness loss in the upper and middle third defects. For lobule reconstruction, double cross skin flap was done in 22% ( $N = 4$ ) of the cases followed by "Y" flap in 6% ( $N = 1$ ) of the cases. Reimplantation of the injured, debrided ear was attempted in 6% ( $N = 1$ ) of the cases as a composite graft (Table 6).

Flap edema occurred in 4 (58 %) cases. There was no wound infection in any of the cases. Skin graft took well in both the cases. There was partial flap necrosis in "Y" flap reconstruction done for lobule defect. Hypertrophic scar was present in one case with double cross skin flap done for lobule defect (Table 7).

In about 86% ( $N = 6$ ) of the cases, the lower lip was injured particularly in the middle third. In only one case (14%), the upper lip was injured. There was partial thickness loss in six cases (86%). Only one patient (14%) presented with full thickness loss of the lower lip involving the middle part (2/3<sup>rd</sup> defect). In 6 (86%) patients the loss was <1/3<sup>rd</sup>. In only one patient (14%), the loss was about 2/3<sup>rd</sup> of the lower lip. None of the cases had more than 2/3<sup>rd</sup> loss.

In about 6 (86%) patients primary reconstruction was done in the trauma theatre under local anesthesia. In only 1 (14%) patient secondary reconstruction was done using bilateral stair step advancement flap for 2/3<sup>rd</sup> defect of the middle of the lower lip in elective theatre under endonasal general anesthesia (Table 8).

In about 5 (72%) patients, wedge excision of the defect was done, and primary suturing was done in three layers

using 3/0 Vicryl for mucosa and muscle followed by 4/0 ethilon simple suture for the skin under local anesthesia. In one patient, there was partial thickness loss involving only the vermilion in the middle third of the lower lip, mucosal advancement flap reconstruction was done. In another patient with about 2/3<sup>rd</sup> loss of middle part of the lower lip, stair step opposing advancement flap reconstruction was done (Table 9).

Wound gaping was present in one case, which was sutured by wedge excision and suturing. It was resutured on the second post-operative day. The wound was healthy on further follow-up. Microstomia was present in one patient who underwent Stair-step Opposing Advancement Flap

**Table 5: Timing of reconstruction – Ear**

| Reconstruction | N (%)   |
|----------------|---------|
| Primary        | 15 (88) |
| Secondary      | 2 (12)  |

**Table 6: Methods of reconstruction**

| Procedures                          | N (%)  |
|-------------------------------------|--------|
| PA flap with cartilage implantation | 2 (12) |
| PA flap                             | 2 (12) |
| Converse tunnel procedure           | 2 (12) |
| Dieffenbach procedure               | 2 (12) |
| Postauricular bipediced flap        | 1 (6)  |
| Skin graft                          | 2 (12) |
| Double cross skin flap              | 4 (22) |
| "Y" flap                            | 1 (6)  |
| Reimplantation                      | 1 (6)  |

PA: Postauricular

**Table 7: Complications**

| Complication              | N (%)  |
|---------------------------|--------|
| Flap edema                | 4 (58) |
| Reimplanted part necrosis | 1 (14) |
| Wound infection           | Nil    |
| Graft loss                | Nil    |
| Partial flap loss         | 1 (14) |
| Hypertrophic scar         | 1 (14) |

**Table 8: Timing of reconstruction – Lip**

| Reconstruction | N (%)  |
|----------------|--------|
| Primary        | 6 (86) |
| Secondary      | 1 (14) |

**Table 9: Methods of reconstruction – Lip**

| Methods                              | N (%)  |
|--------------------------------------|--------|
| Mucosal advancement flap             | 1 (14) |
| Stair step opposing advancement flap | 1 (14) |
| Wedge excision and suturing          | 5 (72) |

reconstruction which resolved after 3 months. There was no wound infection in any of the cases (Table 10).

### Nose

All the patients who had bites on the nose were males in the economically productive age group. All of them belonged to backward community and lived in and around Madurai. They had completed their middle school education. Majority of the victims and assailants were under the influence of alcohol. Family quarrels and unknown reasons were responsible for the injuries. In all the cases, the lower third of the nose was affected. These patients presented to the emergency ward late in the afternoon.

### Reconstruction

In all the four cases secondary reconstruction was done using oblique forehead flap in stages, in elective operation theatre under general anesthesia. In the first stage, defect was recreated, oblique forehead flap was planned, raised and attachment given to the defect. In the second stage after 3 weeks, once the scar settled well, pedicle was divided, and flap inset was given using 4/0 ethilon. The pedicle was returned to reconstruct the glabellar region. The remaining part of the pedicle was discarded. There was no wound infection or flap failure. The average hospital stay was 5 days.

## DISCUSSION

The human bite injury is a deceptive wound. The potential for infective, functional and esthetic complications requires prompt treatment in an appropriate setting. Human bite injuries may present in one of two forms, the closed fist injury or the occlusive bite injury. Primary reconstruction of the facial defects improved the self-esteem of the patients, reduced the hospital stay as well as the cost and had a regular follow-up. Most of the patients belonged to the economically productive age group of 21-40 years. In a study conducted by Harrison, majority of those bitten were young males, with 44% of the males aged 16-25 years. The male to female ratio was 3:1.<sup>7</sup> About 74% of the assailants were under the influence of alcohol while committing the injury. Ear was the common site of injury followed by lip and nose. In a study conducted by Henry *et al.* alcohol consumption was documented in 86% of cases. The majority (70%) occurred over the weekend or on a public

holiday. Facial injuries made up 70% of injuries with the remainder being to the upper limb.<sup>5</sup>

Middle third and lower third defects were the common presentations. Ear reconstruction remains one of the most challenging procedures encountered by reconstructive surgeons. This is due to the intricate detail and anatomic complexity of the cartilaginous auricular framework and its relationship with its thin soft-tissue envelope. The golden standard is a reconstruction with autologous costal cartilage introduced by Tanzer.<sup>8,9</sup> This is later expounded by Brent<sup>10</sup> and refined by the work of Nagata and Firmin.<sup>11</sup> This study focused on autologous ear reconstruction after trauma. Bite injuries were the leading cause of acquired auricular deformities. Totally, there were seven patients who had lip defects. Only one of them had upper lip defect which was partial and included the right lateral subunit. Out of them, five patients had <30% tissue loss. In all the cases, the tissue defect always included the Vermillion. As a complex reconstructive procedure prior to establishment of adequate margins can certainly compromise the ultimate result, it is appropriate not to perform closure until margins have been adequately examined. Functional reconstructions are best accomplished with innervated myocutaneous flaps of orbicularis oris for either lips or the depressor anguli oris lower lip or the innervated levator anguli oris flap for the upper lip.<sup>12,13</sup> In these five patients, primary reconstruction was done with wedge excision of the defect and closure in three layers (Louis method).

## CONCLUSION

Human bite wounds are notoriously deceptive and are often underestimated and undertreated. While controversies regarding optimal management continue, the basic tenets of meticulous wound care are no different than those for contaminated wounds. In ear reconstruction, timely coverage of cartilage framework using local flaps prevented perichondritis and deformities. For upper third defects superiorly based PA flap was ideal. For middle third defects converse tunnel, dieffenbach, and bipedicle flaps were done either with or without cartilage graft. Double cross skin flap gave good esthetic results in lobule reconstruction. In lip reconstruction, primary reconstruction using Louis method served the purpose. Proper wound debridement, antibiotic coverage, primary closure or reconstruction of human bites of the face gives a good result.

**Table 10: Complications – Lip**

| Complication    | Number of patients |
|-----------------|--------------------|
| Wound gaping    | 1                  |
| Microstomia     | 1                  |
| Wound infection | Nil                |

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