

Analysis of Patients with Facial Lacerations Repaired in the Emergency Room of a Provincial Hospital

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Original Article

Background Facial laceration is the most common injury encountered in the emergency room in the plastic surgery field, and optimal treatment is important. However, few authors have investigated this injury in all age groups or performed follow-up visit after repair. In the present study, the medical records of patients with lacerations in the facial area and underwent primary repair in an emergency room over a 2-year period were reviewed and analyzed.

Methods Medical records of 3,234 patients with lacerations in facial area and underwent primary repair in an emergency room between March 2011 and February 2013 were reviewed and identified.

Results All the 3,234 patients were evaluated, whose ratio of men to women was 2.65 to 1. The forehead was the most common region affected and a slip down was the most common mechanism of injury. In terms of monthly distribution, May had the highest percentage. 1,566 patients received follow-up managements, and 58 patients experienced complications. The average days of follow-up were 9.8.

Conclusions Proportion of male adolescents was significantly higher than in the other groups. Facial lacerations exhibit a 'T-shaped' facial distribution centered about the forehead. Careful management is necessary if a laceration involves or is located in the oral cavity. We were unable to long term follow-up most patients. Thus, it is necessary to encourage patients and give them proper education for follow-up in enough period.

Keywords Lacerations / Facial injuries / Follow-up studies

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INTRODUCTION

Facial laceration is the most common injury encountered in an emergency room setting in the plastic surgery field, and optimal treatment is important because these injuries can cause permanent scarring. In addition, in order to minimize scarring after wound repair, continuous follow-up is important for wound management. Many reports on facial laceration in this setting

have focused on pediatric cases, and relatively few reports have addressed this issue in all age groups or followed patients after repair.

Therefore, to look into the characteristics of laceration and the result after repair in all age groups, we reviewed and analyzed cases using the medical records of patients who treated for facial lacerations and underwent primary repair in the emergency room and followed up after repair in outpatient clinic for wound

management at our Department of Plastic and Reconstructive Surgery over a 2-year period.

METHODS

Medical records were retrospectively reviewed and 3,234 patients with facial lacerations and who underwent primary repair in our emergency room between March 2011 and February 2013 were identified. All the patients were treated at the Department of Plastic and Reconstructive Surgery. We excluded all cases in which only key suturing was performed in the emergency room, or in which primary repair was not possible in the emergency room because of a complicated or dirty wound.

All wounds were closed layer by layer to obliterate potential sites of inflammatory exudate accumulation and minimize potential infections [1].

Gender, age, lacerated region, mechanism of laceration, time of injury, monthly and daily distributions, sobriety at time of injury, associated facial fracture, success or failure at follow-up, follow-up time, complications, and the need of re-suturing and scar revision for hypertrophic scar formation were analyzed.

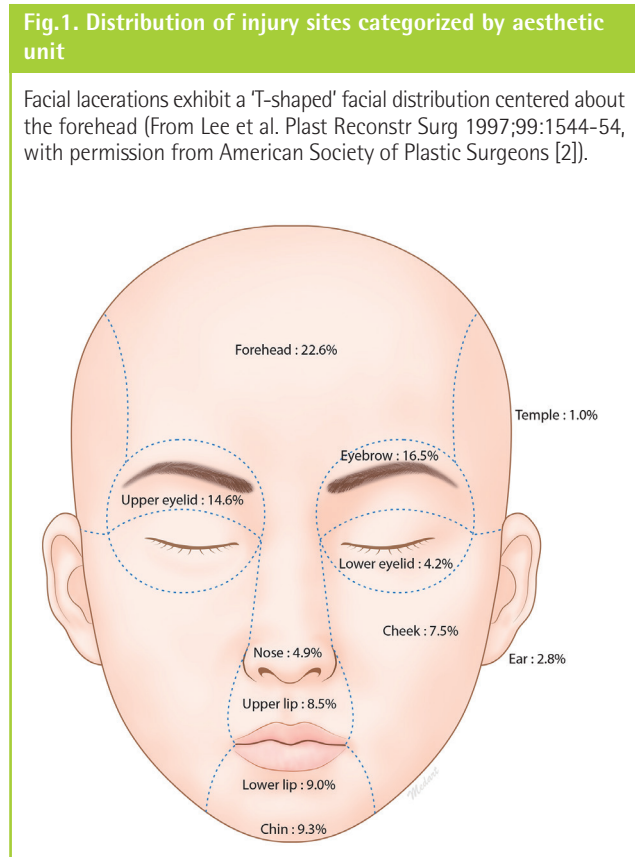
Patients were divided into 5 groups by age as follows: preschool (0–6 years), school (7–12 years), adolescents (13–18 years), adults (19–64 years) and seniors (over 65 years). To investigate differences between genders and sobriety at time of injury, collected data were analyzed using the chi-squared test. Statistical significance was accepted for P-values of <0.05.

Lacerated regions were defined as previously described by Lee et al. (Fig. 1) [2]. Multiple lacerations and lacerations involving more than one anatomical region were analyzed separately.

Mechanisms of the laceration were classified as slip down, traffic accident, impact, or unknown. Traffic accident was defined as an incident involving a pedestrian, the occupant of a vehicle, or the rider or pillion passenger of a motorcycle. Accidents were classified as unknown when the cause was uncertain.

An associated facial fracture was defined as one primarily repaired in the emergency room.

We included the cases of follow-up for checking complete wound healing, and excluded those checked for wound status of incompletely healed.



RESULTS

All the 3,234 patients were evaluated. There were 2,348 (72.6%) men and 886 (27.4%) women (male/female [M/F] ratio 2.65 to 1). Patients included were of preschool age (0–6 years), school age (7–12 years), adolescents (13–18 years), adults (19–64 years), and seniors (> 65 years) and their corresponding distributions were 1,130 (34.9%), 328 (10.1%), 206 (6.4%), 1,406 (43.5%), and 164 (5.1%), respectively (Table 1, Fig. 2).

Table 1. Distribution of age and gender in the study population

Age (yr)	No. of patients			Inebriated state when injured
	Total	Male	Female	
Preschool (0–6)	1,130 (34.9)	750 (66.4)	380 (33.6)	0 (0)
School age (7–12)	328 (10.1)	242 (73.8)	86 (26.2)	0 (0)
Adolescents (13–18)	206 (6.4)	173 (84.0)	33 (16.0)	14 (6.8)
Adult (19–64)	1,406 (43.5)	1070 (76.1)	336 (23.9)	310 (22.1)
Senior (over 65)	164 (5.1)	113 (68.9)	51 (31.1)	12 (7.3)
Total	3,234 (100)	2,348 (72.6)	886 (27.4)	336 (10.4)

Values are presented as number (%).

Fig. 2. Distribution of age and gender

The study cohort comprised 2,348 (72.6%) men and 886 (27.4%) women (male/female ratio 2.65:1). Patients included were of pre-school age (0–6 years), school age (7–12 years), adolescents (13–18 years), adults (19–64 years), or seniors (over 65 years) and these corresponded to 1,130 (34.9%), 328 (10.1%), 206 (6.4%), 1,406 (43.5%), and 164 (5.1%), respectively, of all study subjects.

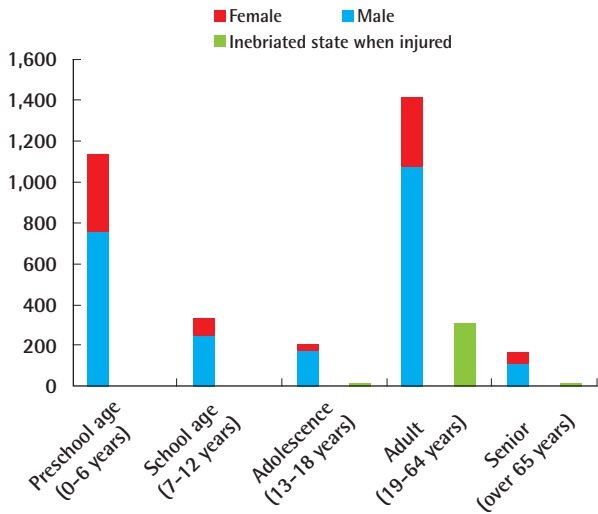


Table 2. Distribution of injury site

Injury site	No. of patients (%)
Forehead	770 (22.6)
Eyebrow	564 (16.6)
Upper eyelid	496 (14.6)
Chin	316 (9.3)
Lower lip	308 (9.0)
Upper lip	290 (8.5)
Cheek	255 (7.5)
Nose	168 (4.9)
Lower eyelid	144 (4.2)
Ear	96 (2.8)
Canthal area	88 (2.6)
Others	188 (5.5)
Total	3,683 (100)

Foreheads (770, 22.6%), eyebrows (564, 16.6%), and upper eyelids (496, 14.6%) were the most common lacerated regions (Table 2, Fig. 1). A slip down (1,326, 41.0%) was the most common mechanism of injury followed by impact (1,197, 37.0%) (Fig. 3). More patients were injured between 7 and 8 PM (Fig. 4).

In terms of monthly distribution, May (345, 10.7%) accounted for the highest percentage and February (189, 5.8%) the least (Fig. 5). Regarding days of the week, Saturday (738, 22.8%) had the highest percentage followed by Sunday (719, 22.2%) (Fig. 6). The percentage of patients inebriated at time of injury was greatest amongst adults (310, 22.1%) (Table 1, Fig. 2).

One hundred thirty-four patients had a facial laceration ac-

Fig. 3. Distribution of facial laceration modes

A slip down (1,326, 41.0%) was the most common mechanism of injury followed by impact (1,197, 37.0%).

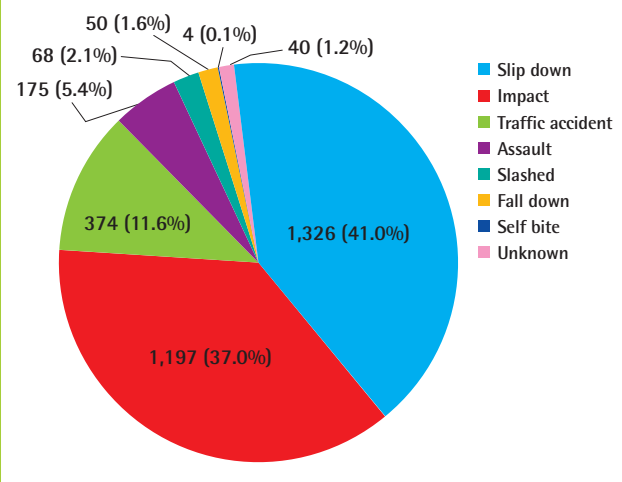


Fig. 4. Distribution of time of injury

More patients were injured from 7 to 8 PM.

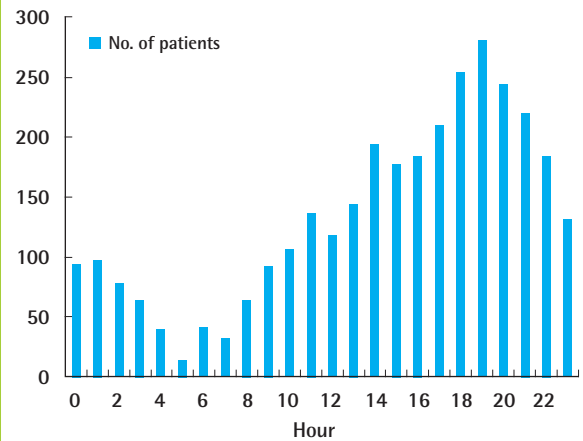


Fig. 5. Distribution by month of injury

Numbers of injuries peaked in May (345, 10.7%) and showed a nadir in February (189, 5.8%).

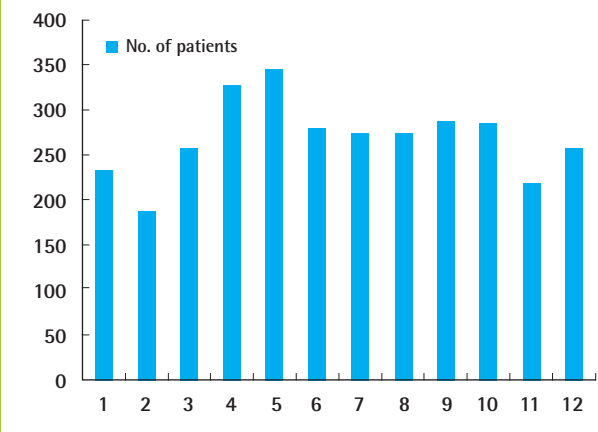


Fig. 6. Injury distribution by day of the week

Numbers of injuries were greatest on Saturdays (738, 22.8%) and Sundays (719, 22.2%).

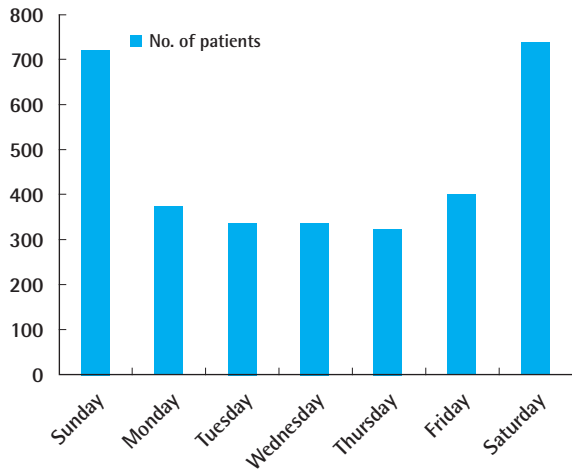


Table 3. Distribution of involved facial fracture

Fracture site	No. of patients
Nasal bone	80
Orbital wall	70
Maxilla	24
Zygoma	18
Mandible	8
Frontal	4

accompanied by fracture, and underwent primary repair in the emergency room. The most common fracture site was nasal bone, followed by the orbital wall (Table 3).

One thousand five hundred sixty-six patients (48.4%) underwent follow-up management, and 58 of these had a complication. The most common complication was dehiscence (32 patients) (Table 4). Thirty-four of the patients with a complication needed re-suturing and no further wound complication occurred in these patients.

The average follow-up time was 9.8 days and stitches were taken out 4-6 days after repair. Nine hundred fifty-one (60.7%) patients were completely restored at this time and follow up was discontinued. Six hundred fifteen (39.3%) patients continued follow up after 4-6 days post-repair for further management. Five of these underwent scar revision due to hypertrophic scarring, but keloid was not encountered.

DISCUSSION

The percentages of males and females with a facial laceration that underwent primary repair in the emergency room between

Table 4. Distribution of complications

Complication	No. of patients	No. of need for re-suture
Dehiscence	32	21
Necrosis	14	7
Infection	8	2
Inappropriate repair	4	4
Total	58	34

March 2011 and February 2013 were 72.6% (2,348) and 27.4% (886), respectively. The M/F ratio for all study subjects was 2.65, and the bias toward men was greatest in adolescents, as has been mentioned previously in several reports [3-6]. In adolescents, the proportion of males was significantly higher than in the other groups ($P < 0.001$). And, the proportion of males in the adult group was significantly higher than in the preschool group ($P < 0.001$). No significant gender difference was observed between the other groups. It is considered that male patients, regardless of age (including the pediatric group), are more likely to have accidents because they are more active and tend to drink alcohol (in adults).

Preschool-aged children accounted for 34.9% of all study subjects, which represented a higher rate of injury than in the other age groups. This was probably because they lacked attention and exhibited instability during walking [4]; these factors appear to be important from the perspective of injury prevention in this group.

The most frequently injured areas were foreheads, eyebrows, upper eyelids, chins, and lips. These findings concur with those of other studies, which found that facial lacerations exhibit a 'T-shaped' facial distribution centered about the forehead [2,4,7,8].

The monthly distribution of cases showed peaks in April and May, presumably because outdoor activities start in earnest at this time of year. The many tourists drawn to the region serviced by our hospital probably explains the higher number of patients treated on Saturdays and Sundays. Although the lack of hospitals in our region with plastic surgeons available at weekends is another possible reason.

Only 2 of the 134 patients of preschool or school age had an accompanying facial fracture, which can be attributed to the flexibility and elasticity of the pediatric skeleton and prominent buccal fat pad [3,4,9]. However, it should be noted that cases with no facial laceration and cases facial laceration that did not undergo primary repair were excluded from this study.

All patients that underwent primary repair in the emergency room and left hospital were asked to attend the outpatient clinic, but only 1,566 patients (48.4%) complied. Our city is a tourist Mecca and is visited by many day trippers. In addition, it is a rel-

atively small city, and thus, 24-hour hospital facilities for the treatment of facial lacerations are limited. Accordingly, many patients that underwent primary repair requested postoperative care near their places of residence, which explains why less than half of all patients were followed.

Fifty-eight patients experienced a complication. Fourteen of these 58 patients were injured while inebriated and 10 of these 14 patients required re-suturing. Although it was not significant ($P=0.578$), we suspect an association between complications in inebriated patients and the need for re-suturing. Further analysis on a large number of cases is needed to resolve this issue.

In all patients, stitches were removed at 4 to 6 days after primary repair, except for patients with a wound infection requiring drainage through the repair site and for those requiring early stitch removals due to inappropriate repair. Of the patients that developed dehiscence after stitch removal, some with mild dehiscence were treated with a surgical adhesive strip (Steri-Strip) and achieved complete wound healing, and others with moderate dehiscence were re-sutured. Dehiscence caused by stitch removal using excessive strength did not occur in any patient.

All necrosis cases were partial, and treated using a foam dressing after debridement. Repair was performed after debridement when there was a high probability of substantial scarring after wound dressing.

All infections occurred in cases of lip laceration, involving oral mucosa or a penetrating wound. Infections with mild discharge were treated by dressing, gargling, or oral antibiotics, and those with severe discharge by stitch removal at time of infection detection, drainage, infection control for 4-5 days, and delayed repair. An irregular skin margin at the repaired site developed in some patients due to inappropriate repair during follow-up. They underwent re-suturing at time of detection, all re-sutured wounds healed completely without additional complications.

Follow-up was performed at 1, 3, and 5 days after primary repair (not on weekends or holidays). Sometimes stitches were removed at 4 days after primary repair when wound healing was rapid, for example, for simple wounds in eyelids. According to one report, surgical adhesive strip may provide some benefits for up to 6 weeks postoperatively [10]. However, the duration of its use is highly dependent on convenience and patient compliance, and thus, after total stitch-out, we applied surgical adhesive strip for 2 weeks to amenable sites to prevent hypertrophic scarring. Subsequent follow-up treatments were administered at 14 days after primary repair and involved the prescribing of silicone ointment or gel and the education of patients on the benefits of frequent massage. Afterwards, we recommended monthly follow-up visits for scar management.

As mentioned in various literatures, continuous use of silicone

ointment or gel was known to be effective in managing the scars [11-13]. Nevertheless, this study has limitation because only 67 patients (4.3%) were followed for more than one-month, and thus, we were unable to follow-up most patients beyond scar maturation.

This research on facial lacerations repaired in the emergency room was based on review of 3,234 patients. As mentioned above, proportion of male adolescents was significantly higher than in the other groups. Facial lacerations exhibit a 'T-shaped' facial distribution centered about the forehead. All infections occurred in cases of lip laceration, involving oral mucosa or a penetrating wound. Thus, careful management is if a laceration involves or is located in the oral cavity. Because of our city is a tourist Mecca, many patients that underwent primary repair requested postoperative care near their places of residence. Thus, we were unable to long term follow-up most patients. It is necessary to encourage patients and give them proper education for follow-up in enough period.

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