

Namita Shrestha
Bhawana Dangol
Ishwor Raj Devkota
Ajit Nepal
Deepak Yadav
Sangita Bhandary

Department of ENT-Head & Neck
Surgery, Patan Hospital, Patan
Academy of Health Sciences,
Lagankhel, Kathmandu, Nepal

Corresponding Author:

Dr. Namita Shrestha
Department of ENT-Head and Neck
Surgery, Patan Hospital, Patan
Academy of Health Sciences,
Lagankhel, Kathmandu, Nepal

E-mail: namitadgr8@yahoo.com

AN OVERVIEW OF FACIAL AND HEAD AND NECK TRAUMA AT PATAN HOSPITAL

Objective:

To find out the prevalence of various types of head and neck trauma.

Material and Methods:

This retrospective study was done in the department of ENT and HNS, Patan Hospital, PAHS. Charts were retrospectively reviewed for total 61 inpatients with a diagnosis suggestive of head and neck trauma from August 2013 to January 2015. Data was collected for age, sex, address, type of admission (emergency/OPD), mechanism of injury, site of injury, imaging including X-rays/CT scan wherever applicable and results, surgical therapy, type of anesthesia, hospital admission duration, complications, and follow-up and analyzed.

Result:

Males were common than females (62.3% vs. 37.7%). Fall was the most common mode of injury (100%) in both pediatric and elderly population and in adults RTA (42.10%) was the most common mode. In the type of injury most common in pediatrics was oral cavity and oropharyngeal injury (47.60%), in adults facial soft tissue injury (STI) and facial fractures (42.10%) were equally common and in geriatrics it was (100%).

Conclusion:

Adult males were prone to head and neck trauma mostly sustaining soft tissue injury (STI) and fractures due to RTA and physical assault. Injury to oral cavity and oropharynx and STI due to fall is common in extreme of ages. Though the management outcomes were good and no grave complications were reported in this study.

Key words: Cut, Fall injury, Fracture, Trauma

INTRODUCTION:

Since time, immemorial injuries to the head and neck specially face have been documented in literature and even depicted in sculptures, reflecting the image of society.¹ In this modern, mechanical era, injuries to the face, head and neck are becoming more frequent.² Head and neck trauma includes many facial fractures as well as soft tissue injury to face, oropharyngeal injury and also trauma to neck. Head and neck trauma may or may not be associated with fractures like maxillofacial fractures or isolated fracture of nasal bone.¹ The head and neck consists of several vital organs with functional and aesthetic units. The aim of management of head and neck trauma is functional and aesthetic recovery in the shortest period. The final outcome depends on initial wound care and primary repair. Head and neck trauma demand meticulous care.¹⁻⁴ Oropharyngeal trauma which goes largely under reported has been reported to cause grave complications like carotid artery aneurysm and Cerebrovascular accidents (CVA).⁵⁻⁹ Facial trauma and fracture nasal bone leading to disfigurement becomes a social stigma and has the gross detrimental effect on the personality and future of the victim.¹⁻³ Most reviews of head and neck trauma have concentrated on fractures. Soft tissue trauma to face and oropharyngeal trauma have been largely under reported and we aim to find out the prevalence of different soft tissue trauma of head and neck along with the fractures at Patan Hospital. The aim and objective of this study was to find out the pattern of various types of head and neck trauma in this region.

MATERIAL AND METHODS:

Charts were retrospectively reviewed for total 61 inpatients with a diagnosis suggestive of head and neck trauma at Patan Hospital, Patan Academy of Health Sciences (PAHS) from August 2013 to January 2015. Ethical approval was taken from institutional review committee. Patients of all age group with all type of accidental, suicidal and homicidal trauma to face, oropharynx and neck were included in the study. Records were evaluated for the following clinical data points: age, sex, address, type of admission (emergency/OPD), mechanism of injury, site of injury, associated other injury, imaging including X-rays/CT scan wherever applicable and results, surgical therapy and indications, type of anesthesia, hospital admission duration, complications, and follow-up. Age group is divided into pediatric (0-14 years), adult (15-60 years) and geriatric (60 and above). Results were subsequently analyzed to determine the prevalence of various types of head and neck injury at Patan Hospital and their mode of management, duration of hospital stay and complication. Data were also analyzed to find the correlation between different age group and type and mode of injury.

RESULT:

A total of 61 patients with head and neck trauma admitted in the department of ENT at Patan hospital during August 2013 to January 2015 were included in this study. Of the 61 cases, most of them were adult age group 62.3%, the females were 37.7% (23) and 62.3% (38) were male. 86.9% had presented to emergency room (ER) and 13.1% presented to out patient

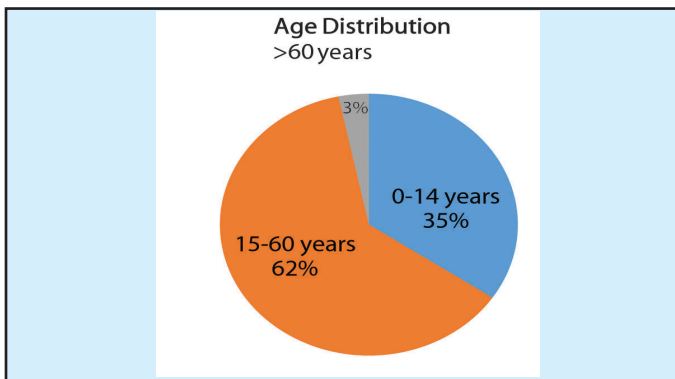
Table 1. Demographic data of the 61 cases.

Age group	Pediatrics(1-14years)	34.4%
	Adult(15-60yrs)	62.3%
	>60years	3.3%
Sex	Female	37.7%
	Male	62.3%
Address	Lalitpur	67.2%
	Kathamndu	14.7%
	Bhaktapur	6.6%
	Others	11.5%
Presentation	ER	86.9%
	OPD	13.1%

department(OPD). Maximum (67.2%) of them were from Lalitpur. Demographic data are tabulated in table1.

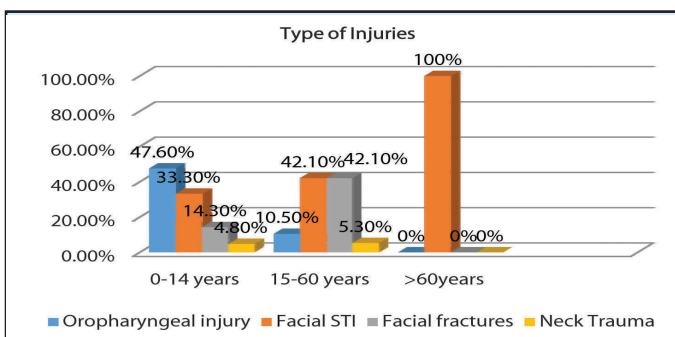
In our study patients were divided into three age groups; pediatric(0-14 years), adult (15-60 years) and geriatric (>60years). Most of the patients belonged to the adult age group as shown in the figure 1.

Figure 1: Age Distribution



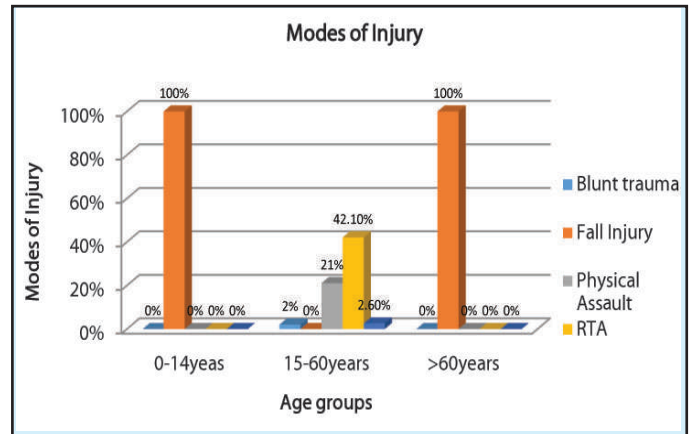
All the soft tissue injuries(STI) including cuts and lacerations to the face, forehead, cheeks, pinna were included in the facial soft tissue injuries which was 41% of all the injuries, 23% had trauma over oral cavity and oropharynx, which included cut lips, injuries to buccal mucosa, alveolus, soft palate and hard palate. Facial fractures included fractures of maxilla, mandible, nose and temporal bone were seen in 31.1% of the cases where

Figure 2: Types of injuries according to age groups.



as 4.1% of the cases had trauma to the neck, which included 3 cases of cut throat, blunt trauma to neck. Different injuries in different age groups have been demonstrated in figure 2. In the pediatric age group oropharyngeal injury was the most common injury whereas facial STI and facial fractures are the commonest injuries in adult age group. In the geriatrics facial STI is the only injury sustained. The most common mode of injury was fall (57.4%), followed by RTA (26.2%), physical assault (13.1%), blunt trauma(1.6%) and suicidal attempt (1.6%). Different modes of injury in different age group has been demonstrated in the figure 3.

Figure 3: Modes of injury according to age groups.



Imaging was done in only 34.4% of the cases. X-ray was done in 22.9% of the cases(all the fracture nasal bone) and CT scan was done in 11.5% of the case. One case of blunt trauma neck had undergone nasopharyngolaryngoscopy.14.5% of the patients were managed conservatively and 85.5% had to undergo surgery. Among them primary repair was done in 57.4% of the total cases and 9.7% cases of STI were infected which required debridement and hence secondary repair was done. In all the cases of fracture nasal bone i.e. 26.2% of all the injuries, close reduction was done. One case of cut throat required exploration and repair and tracheostomy. In one case of septal haematoma incision and drainage was done. 37.7% of surgical interventions were done under general anesthesia and 50.8% were done under local anesthesia. In our study complication was noted in 11.5% of the cases. 9.7% of the total cases developed wound infection requiring secondary repair. A case of fracture temporal bone which presented late with facial nerve palsy and traumatic tympanic membrane perforation which was managed conservatively. Another case of avulsion of pinna had developed avascular necrosis of upper 2/3rd of pinna.

DISCUSSION:

In our study most of the patients were males 62.3% like in other studies.^{6,8,9,11,12} In a study conducted by Jeffrey C. Posnick et al.¹² injuries in boys were more prevalent than in girls (63% versus 37%). Adults were more prone to trauma (62.3%) followed by pediatric (34.4%) in our study. Most of the studies observed male and adult

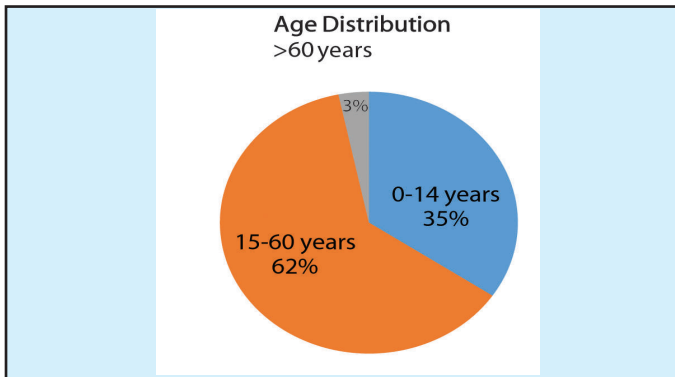
Table 1. Demographic data of the 61 cases.

Age group	Pediatrics(1-14years)	34.4%
	Adult(15-60yrs)	62.3%
	>60years	3.3%
Sex	Female	37.7%
	Male	62.3%
Address	Lalitpur	67.2%
	Kathamndu	14.7%
	Bhaktapur	6.6%
	Others	11.5%
Presentation	ER	86.9%
	OPD	13.1%

department(OPD). Maximum (67.2%) of them were from Lalitpur. Demographic data are tabulated in table1.

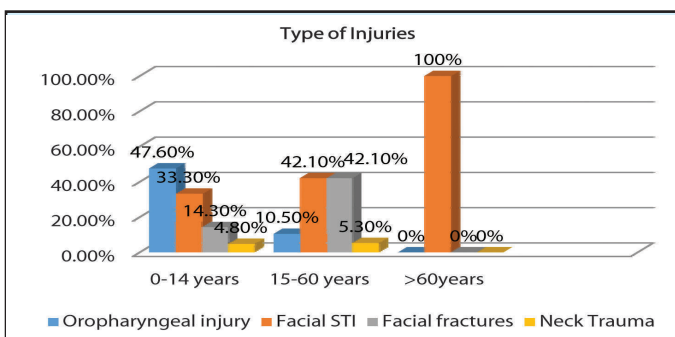
In our study patients were divided into three age groups; pediatric(0-14 years), adult (15-60 years) and geriatric (>60years). Most of the patients belonged to the adult age group as shown in the figure 1.

Figure 1: Age Distribution



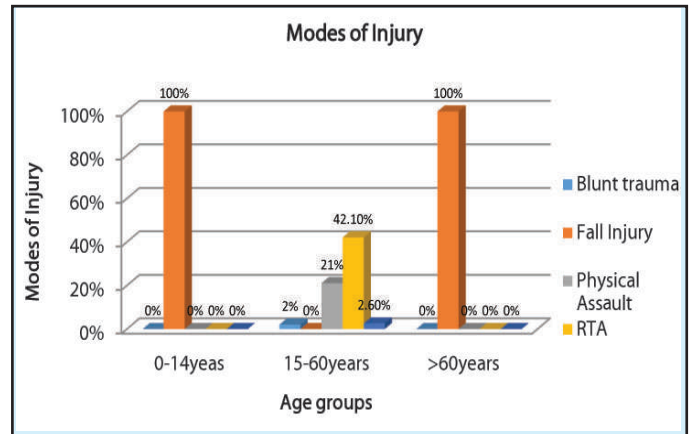
All the soft tissue injuries(STI) including cuts and lacerations to the face, forehead, cheeks, pinna were included in the facial soft tissue injuries which was 41% of all the injuries, 23% had trauma over oral cavity and oropharynx, which included cut lips, injuries to buccal mucosa, alveolus, soft palate and hard palate. Facial fractures included fractures of maxilla, mandible, nose and temporal bone were seen in 31.1% of the cases where

Figure 2: Types of injuries according to age groups.



as 4.1% of the cases had trauma to the neck, which included 3 cases of cut throat, blunt trauma to neck. Different injuries in different age groups have been demonstrated in figure 2. In the pediatric age group oropharyngeal injury was the most common injury whereas facial STI and facial fractures are the commonest injuries in adult age group. In the geriatrics facial STI is the only injury sustained. The most common mode of injury was fall (57.4%), followed by RTA (26.2%), physical assault (13.1%), blunt trauma(1.6%) and suicidal attempt (1.6%). Different modes of injury in different age group has been demonstrated in the figure 3.

Figure 3: Modes of injury according to age groups.



Imaging was done in only 34.4% of the cases. X-ray was done in 22.9% of the cases(all the fracture nasal bone) and CT scan was done in 11.5% of the case. One case of blunt trauma neck had undergone nasopharyngolaryngoscopy.14.5% of the patients were managed conservatively and 85.5% had to undergo surgery. Among them primary repair was done in 57.4% of the total cases and 9.7% cases of STI were infected which required debridement and hence secondary repair was done. In all the cases of fracture nasal bone i.e. 26.2% of all the injuries, close reduction was done. One case of cut throat required exploration and repair and tracheostomy. In one case of septal haematoma incision and drainage was done. 37.7% of surgical interventions were done under general anesthesia and 50.8% were done under local anesthesia. In our study complication was noted in 11.5% of the cases. 9.7% of the total cases developed wound infection requiring secondary repair. A case of fracture temporal bone which presented late with facial nerve palsy and traumatic tympanic membrane perforation which was managed conservatively. Another case of avulsion of pinna had developed avascular necrosis of upper 2/3rd of pinna.

DISCUSSION:

In our study most of the patients were males 62.3% like in other studies.^{6,8,9,11,12} In a study conducted by Jeffrey C. Posnick et al.¹² injuries in boys were more prevalent than in girls (63% versus 37%). Adults were more prone to trauma (62.3%) followed by pediatric (34.4%) in our study. Most of the studies observed male and adult

prevalence in trauma cases.^{4,13} Of all the trauma STI was more prevalent (41%), followed by facial fractures (31.1%). Wulkan M et al.¹³ also found male predominance (78%) and its peak age was between 20 and 39 years i.e. adult age group which is comparable to our studies. The major cause was interpersonal violence (48.1%), followed by fall (26.2%), run overs (6.4%), sports (5.4%), car accidents (4.2%), motorcycle accidents (3.1%), non-fall impacts (2.4%), occupational injuries (1.8%), gunshot wounds (1.2%), unspecified (1.2%), which is not comparable to our studies. Contusion is the most common injury (23.8%), followed by fractures of the mandible (21.9%), Le Fort/pan facial/complex (17.8%), nasal bones (11.6%), zygoma (10.3%), which is comparable to our study. In our study in the pediatric age group oral cavity and oropharyngeal injury was most prevalent (47.6%), followed by facial STI (33.3%), Facial fractures (14.30%) and neck trauma (4.8%).¹² All these injuries were due to falls (100%). Collao-González C et al.¹¹ in his retrospective study of pediatric facial trauma in 3 years found the main cause of injury were falls and soft tissue injuries the most common type of injury which is second in ours. Similarly, Jalalvandi F et al.¹⁴ in his study of pediatric trauma in western Iran, found the most common cause for trauma was fall from heights (65.5%) and road traffic accidents (16.4%). The most common anatomical sites of injury were the upper limbs followed by the head and neck 36.8% and 31.2%, respectively. According to James D. Kretlow et al.⁴ slips, trips and falls were common cause of isolated soft tissue injuries such as laceration and contusions, mostly in children and the elderly which is comparable to our study. In the adult age group, facial STI and facial fractures were equally prevalent (42.10% each), followed by oropharyngeal trauma (10.5%) and neck trauma (5.30%). In the modes of injury RTA (42.10%) is the most common mode followed by physical assault (21%). Wulkan M et al.¹³ found the major cause was interpersonal violence (48.1%) followed by fall (26.2%). Contusion is the most common injury (23.8%), which is comparable to our study. Similarly, Gassner R et al.¹⁵ in his study over a period of 10 years found five major mechanisms of injury; in 38% cases it was during activity of daily life, in 31% during sports, in 12% violence, 12% traffic accidents, 5% work accidents and in 2% there were other causes. James D. Kretlow, et al.⁴ found violence and motor vehicle accidents as the predominant causes of injury in individuals ranging from 15 to 50 years old, which is comparable to our study. Imaging plays a great role in head and neck trauma. However, in our study imaging was done in only 34.4% of the cases. X-ray was done in 22.9% of the cases (all the fracture nasal bone) and CT scan was done in 11.5% of the case. The choice of imaging for facial fractures depends upon the patient's hemodynamic stability, ability to cooperate, and available resources. Visualization of fractures among the complex curves of facial bones is best achieved using computed tomography (CT).¹⁶ Though the need of nasal X-ray is controversial and widely discouraged, it may be used to screen for facial and nasal bone fractures if CT is unavailable, as well as for the documentation of injury in subsequent litigation. In such cases, evaluation may begin with a single occipitomeatal view.^{16,17} Though in most of the study CT is significantly

superior to X-ray in the diagnosis of fracture of nasal bone, specially for the detection of transverse fractures of the nasal bone.¹⁶⁻¹⁸ In our study, imaging was done in limited numbers cases. This may be because only the cases admitted to the ENT ward were included and most of them had sustained soft tissue injury. Also as there was lack of neurosurgical and maxillofacial expertise cases with head injury and complex fractures had to be referred to other center. So, there is a need of further study which includes all these cases. In our study, 85.5% of the injuries had to undergo surgical repair. Among them primary repair was done in 57.4% (All the cases of oral cavity and oropharyngeal injury and most of the facial STI) and 9.7% cases of STI were infected and required debridement and hence secondary repair was done. In all the cases of fracture nasal bone i.e. 26.2% of all the injuries close reduction was done. Ryan J. Soose et al.⁸ in their study of pediatric oropharyngeal injury, had observed that most wound did not require repair. In their study, only 11% of wounds were surgically closed, a rate that is similar to those reported by Schoem et al.⁸ Which is not comparable to our study, where all of the patients had undergone primary repair. This may be because most of the wound healed spontaneously and less severe injuries were not admitted in our study. Ryan J. Soose et al.⁸ and other studies^{5,6,8} have recommended reserving the operating room for wounds with avulsed tissue or an obvious nasopharyngeal-oropharyngeal fistula, as well as for foreign body removal, active hemorrhage, airway concerns or exploration when awake examination is not possible. Lateral wounds, especially of the tonsillar pillars, have a greater risk of ICA injury than midline wounds, hence require exploration, repair and imaging. Catastrophic, neurologic sequelae from seemingly innocuous oropharyngeal injuries are well documented in earlier case reports.⁵⁻⁹ Prior studies have reported nonneurologic complications such as bleeding, retropharyngeal abscess, facial cellulitis, velopharyngeal insufficiency and pneumomediastinum.^{5,7-9} Fortunately, none of such complications were observed in our study. Similarly, most of the facial STI were repaired primary except for six which were repaired secondarily because of late presentation and infection. Previous studies like in ours have supported early repair of soft tissue injuries of face.⁴ Similarly, Bhattacharya V et al.¹ also emphasizes on early repair of facial soft tissue injuries. Even in major trauma, while instituting the resuscitative measures, the wound may be dealt after 4-6 hours. More emphasis is done for the repair of facial soft tissue injuries as the face consists of several organs and aesthetic units. Disfigurement following trauma becomes a social stigma and has the gross detrimental effect on the personality and future of the victim.

Similarly, all of the fracture nasal bone in our study were treated with close reduction technique. Close reduction of fracture nasal bone has been the standard treatment since antiquity and is the most preferred treatment modality in all acute phases of fractured nasal bones.^{19,20} Even in large deviations, closed reduction can be attempted prior to rhinoplasty as this would simplify the

task of the surgeon.²⁰ However, there remains controversies regarding the treatment of traumatic nasal fractures. Recommended management varies widely from no intervention at all to extensive open procedures involving rhinoplasty techniques. Closed reduction is a relatively simple procedure, at times producing acceptable outcomes. There remains no statistical difference in revision rate, patient satisfaction or surgeon photographic evaluation scores between the closed and open treatment groups when fractures are treated in the recommended fashion.²⁰

CONCLUSION:

Adult males were prone to head and neck trauma. Soft tissue injury was the most common injury followed by facial fractures. Oral cavity and oropharyngeal injury was the most common type of injury in the extremes of ages with fall injury being the commonest mode of injury. However in adults RTA and physical assault was the most common mode of injury, facial fractures and STI were equally prevalent in this age group. Though the management outcomes were good and no grave complications were reported in this study, further study with larger sample size, and longer follow-ups is however recommended. Number of sample would have been much larger if outpatient cases and associated polytrauma cases could have been included which are the limitation of this study.

REFERENCES:

1. Bhattacharya V. Management of soft tissue wounds of the face. *Indian J Plast Surg.* 2012;45:436-43.
2. Masters F, Georgiade N, Horton C, Pickrell K. Treatment of soft tissue trauma of face. *JAMA.* 1954;156(2):105-9.
3. Mohan M, Prasad BR, Sharma SM, Shetty T, Priyadharsana PS. Management of soft tissue injuries – case series. *NUJHS* 2015 Mar; 5(1):79-92.
4. Kretlow JD, McKnight AJ, Izaddoost SA. Facial soft tissue trauma. *Semin Plast Surg.* 2010 Nov; 24(4): 348–56.
5. Roberson DW. Oropharyngeal trauma in children. [Online]. 2015 Jul 30 [Cited; 2016 Jan 10]; Available from: <http://www.uptodate.com/contents/oropharyngeal-trauma-in-children>
6. Kupietzky A. Clinical guidelines for treatment of impalement injuries of the oropharynx in children. *Pediatric Dentistry.* 2000;22(3):229-31.
7. Schoem SR, Choi SS, Zazal GH, Grundfast KM. Management of oropharyngeal trauma in children. *Arch Otolaryngol Head Neck Surg.* 1997; 123:1267-70.
8. Soose RJ, Simons JP, Mandell DL. Evaluation and management of pediatric oropharyngeal trauma. *Arch Otolaryngol Head Neck Surg.* 2006;132(4):446-51.
9. Global aging [Internet]. Kathmandu: Government of Nepal, Ministry of Health and Population; 2010 March; [cited 2016 Feb 4]. Available from: www.globalaging.org/health/world/2010/nepal.pdf.
10. Collao-González C, Carrasco-Labra A, Sung-Hsieh HH, Cortés-Araya J. Epidemiology of pediatric facial trauma in Chile: a retrospective study of 7,617 cases in 3 years. *Med Oral Patol Oral Cir Bucal.* 2014 Mar 1;19(2):e99-e105
11. Posnick JC, Wells M, Pron GE. Pediatric facial fractures: Evolving patterns of treatment. *Journal of oral and maxillofacial surgery.* 1993 Aug; 51(8):836–44.
12. Wulkan M, Parreira JG Jr, Botter DA. Epidemiology of facial trauma. *Rev Assoc Med Bras.* 2005 Sep-Oct; 51(5):290-5. Epub 2005 Oct 31.
13. Jalalvandi F, Arasteh P, Safari Faramani R, Esmaeilvand M. Epidemiology of Pediatric Trauma and Its Patterns in Western Iran: A Hospital Based Experience. *Glob J Health Sci.* 2015 Oct 26;8(5):51430.
14. Gassner R, Tuli T, Häch I O, Rudisch A, Ulmer H. Cranio-maxillofacial trauma: a 10 year review of 9,543 cases with 21,067 injuries. *J Craniomaxillofac Surg.* 2003 Feb;31(1):51-61.
15. Mayersak RJ. Facial trauma in adult. [Online]. 2014 Nov 4 [Cited; 2016 Jan 10]; Available from: <http://www.uptodate.com/contents/facial-trauma-in-adults>.
16. McMonagle BA, Gleeson M. Nasal Fractures. *Scotts Brown's Otorhinolaryngology, Head and Neck Surgery*, 7th edition. London: Edward Arnold publisher Ltd.; 2008: 1609-16.
17. Baek HJ, Kim DW, Ryu JH, Lee YJ. Identification of nasal bone fractures on conventional radiography and facial CT: comparison of the diagnostic accuracy in different imaging modalities and analysis of interobserver reliability. *Iran J Radiol.* 2013;10(3):1407.
18. Mondin V, Rinaldo A, Ferlito A. Management of nasal bone fractures. *Am J Otolaryngol.* 2005;26:181-4.
19. Thiagarajan B, Ulaganathan V. Fracture nasal bones. *Online J Otolaryngol.* 2013; [cited March 04, 2016]; 3(supplement 5):1-16.
20. Ondik MP, Lipinski L, Dezfoli S, Fedok FG. The treatment of nasal fractures A changing paradigm. *Arch Facial Plast Surg.* 2009;11(5):296-302.