

Analysis and Review of ENT Injuries Sustained in Air Bus Accident

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The present study briefly analyses and review the pattern of ENT injuries sustained amongst the survivors of the ill-fated Air-Bus accident which crash landed at Bangalore on 14 Feb 90. Both blunt and penetrating injuries of Head and Neck region were seen. The extent of injuries varied from maxillo-facial injuries to Laryngotracheal trauma with fracture of thyroid cartilage. The investigative procedure, mode of injury and the treatment modalities are discussed. Suitable recommendations are made to avoid such injuries in future. The experience gained from these patients is examined and presented in the hope of resolving prevailing controversies about the treatment of acutely injured larynx.

Air crash injuries in service aircrafts are well known in our set up. They are either fatal or result mainly in multiple injuries (ie Head, abdominal, skeletal or maxillofacial injuries). Our hospital provided the specialist services to the fortunate survivors of ill-fated Air Bus-320 passengers which crash landed on 14 Feb 90 at Bangalore. Out of 56 survivors (30.6%) from 153 passengers onboard the aircraft, 27 passengers were evacuated to our hospital for management. The present study involves the analysis and review of 10 passengers (37%) out of these 27, who sustained ENT injuries. The head and neck region by virtue of being exposed, unprotected, occupying the central portion of body and prone to whiplash effect, bore the main brunt.

Case Reports

Case I

A 54 years old male (YHT) was dazed, but fully conscious and had bleeding from nose, columella, forehead and medial canthus (Rt eye) when first seen at the Hospital. There were lacerations on forehead and medial canthus (Rt).

cut injury of columella and dorsum of nose with fracture of nasal bones, which was confirmed radiologically. Bleeding from nose and other parts of face was controlled and reduction and immobilisation for fracture nasal bone was done under general anaesthesia with endo-tracheal intubation.

Case No II

A 52 years old male (SDJ) had bleeding from columellar region and nose. Clinically and radiologically he was detected to have fracture of frontal process of maxilla (Rt) and Nasal bones. Patient made uneventful recovery after treatment.

Case No III

A 63 year old male, Z F, when seen in casualty was fully conscious but had complaints of pain in the Rt side of chest and hip, bleeding from forehead, nose and lip. There were multiple abrasions/lacerated wounds over the face and fracture of nasal bones. Lacerated wounds of face were sutured. Nasal bone fracture was reduced manually. Head injury and injury to lumbosacral region was ruled out.

Case No IV

A 29 yrs old lady had bleeding from the lower lip, angle of mouth and forehead (lt), Black eye (lt) and swelling over the dorsum of nose.

Clinically, there was fracture of nasal bones and cut injury over the forehead and lower lip. X-ray skull and lumbo-sacral region ruled out any head injury or injury to spinal region. Fracture nasal bones was reduced manually after giving Fortwin injection and cut injury over face and lip

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sutured under antibiotic cover. Patient made uneventful recovery.

Case No V

A 48 years old man complained of pain in the neck, difficulty in breathing, inability to speak and swallow, hoarseness of voice and gave history of haemoptysis. He stated that he was resting with his neck extended when due to sudden impact, he was pushed forward and his neck struck against the service table in front, which was lying unfolded. Clinically there was no cyanosis or stridor. There was loss of Laryngeal prominence, contusion over the anterior part of the neck at the Laryngeal region and tenderness over the skeletal frame work of Larynx. Beside these, there was haematoma on tongue and laceration of lower lip. Direct laryngoscopy and fiberoptic laryngoscopy revealed narrowing of the laryngeal inlet, gross oedema of false and true vocal cords with petechial haemorrhages over the vocal cords, more on the right as compared to left; mobility of the right vocal cords was restricted. X-ray soft tissue Neck AP & Lateral view revealed fracture of thyroid cartilage (Rt).

Cut injury over the lower lip was sutured. Ryles tube was passed and the patient was closely observed and managed in ICU on conservative line of treatment. To meet any respiratory distress in view of impending Laryngeal oedema, endotracheal intubation and Tracheostomy set was kept at bed side of patient. However it was not required as patient made uneventful recovery and was discharged after 7 days.

Other cases

Case No 6,7,8,9 & 10 had minor abrasions and lacerations over the face with no bony injury. Suturing and care of the wound was done.

Discussion

The analysis and review of ENT injuries sustained among 10 survivors revealed that pattern of injuries are almost identical as is seen in the road-traffic accident or injuries at work or sports injuries. Fracture of nasal skeleton with laceration and blunt injury over the face were the

common injuries (90%) for obvious reasons that the face is exposed, unprotected and occupies the central part of body and bears maximum whiplash brunt. Acute laryngeal trauma with fracture of thyroid cartilage was seen in one of the passengers. With sudden impact, his extended neck was forced against the edge of serving table in front and resulted in the blunt injury to larynx and fracture of thyroid cartilage. This position fixes the larynx and limits the normal lateral and anteroposterior mobility¹.

Maran et al² is of the view that any classification of types of laryngeal injury is an unhelpful exercise unless it is confined to injuries to the supraglottis, the glottis, the subglottis or mixed injuries. Mehta et al³ proposed a new classification for laryngo-tracheal injuries in order to simplify the outline for management of these cases in two groups. Group I included injury involving the soft tissue only. Those involving skin and subcutaneous tissue were sub-grouped as Group Ia and those involving that of mucosa/submucosa of larynx or trachea as sub group Ib. Group II includes injuries involving the skeletal frame work of larynx (Group IIa) or trachea (Group IIb). In the present study, injuries were of both penetrating as well as blunt types. Lucente et al⁴ in his series of 18 cases concluded that blunt injuries tended to produce more extensive soft tissue trauma and to be associated with other skeletal injuries. Penetrating injuries are more localised with better prognosis as compared to blunt injuries.

The blunt injury can be high velocity or low velocity injuries. It is the high velocity blunt injury which generally fractures the skeleton of the larynx. The fate of the thyroid cartilage depends on its degree of calcification and thus on the age of patient. If the thyroid cartilage is pushed back-wards over the cervical spine, then it splays apart. A minimal injury like this with an elastic thyroid cartilage will result in no fracture but, if there is any rigidity in the thyroid cartilage or if the force is great enough, then the cartilage will usually split down the front or down the thyroid prominence. If the thyroid cartilage is calcified and is then compressed against the cervical spine, it is unlikely to have enough inherent elasticity to

return to its original position and there will be loss of thyroid prominence as it has happened in one of our patients.

In our series, there were cases of Nasal bone fractures and a fracture of frontal process of maxilla with cut injuries over forehead, medial canthus, cheek, columella, alar cartilage and chin etc. The cut injuries were taken care off by suturing. Nasal bone fractures were reduced and immobilised with POP under GA. Cosmetic and functional results were satisfactory in those who reported for review after 6 weeks.

Any injury to larynx will result in some oedema of soft tissue which usually has no permanent effect other than in Reinkes space where permanent oedema of the vocal cord can result or resolve into a laryngeal polyp. In the first aid situation, a tracheostomy may be needed, but this is very much less favoured than immediate intubation. If there is merely oedema present with no suggestion of intraluminal bleeding or tracheal damage then the patient can be kept at bed rest with or without steroids or steam inhalation.

More likely, however the airway will be at risk and rather than performing an immediate tracheostomy, the patient should be intubated. In general terms, the arytenoids will be swollen in nearly every moderately severe laryngeal trauma so the patient should be fed with a nasogastric tube for few days to stop inhalation from glottic incompetence.

If there is any significant degree of bleeding within the larynx, then it should be opened by way of midline approach (Laryngofissure) and the space evacuated and quilted with 3-0 vicryl sutures. If there is damage to the skeletal structure, then a principle of minimal debridement should be practiced.

The effect of organised haematoma is most marked in supraglottic space, where there is the most scope for expansion of soft tissue and obliteration of the airway. Interarytenoid area is also a very large potential space with debilitating consequences if organisation occurs within this area.

The thyroid cartilage if fractured, will heal using Fibrous tissue and provided it is in good

position, this is just as satisfactory as wiring or stitching it together. If, however, it is compressed, as in a calcified thyroid cartilage then it has to be reconstituted and held outwards with a stent. In our case, conservative treatment (in form of bed rest, O₂ inhalation, steam inhalation, IV Fluids, Steroids, antibiotics, periodic suction of Pharyngeal secretions and naso gastric feeding) under close observation in ICU was quite satisfying and rewarding. Tracheostomy could be avoided without compromising airway and laryngeal function.

Conclusion

Analysis and review of ENT injuries among survivors of Air Bus accident which crash-landed at Bangalore on 14 Feb 90 has been discussed. Out of 56 survivors, 27 cases were evacuated to Command Hospital, Bangalore. Out of these 27, 10 cases sustained ENT injuries. Among these, 9 had maxillo-facial injuries while in one, there was laryngo-tracheal trauma with fracture of thyroid cartilage.

Pattern of ENT injuries in this aircraft accident was almost identical to vehicular accident or sports injuries. They were penetrating and blunt injury in type.

Management consisted of conservative treatment of soft tissue injury and manipulation under GA for fractures of Nasal bone and frontal process of maxilla. Close observation of these patients in ICU specially for laryngo tracheal trauma was rewarding and tracheostomy could be avoided without compromising airway and laryngeal function.

Recommendation

1. In view of the fact that most of the ENT injuries were due to whiplash effect where upper part of body was thrown forward and resulted into maxillofacial injuries and laryngeal trauma, it is evident that abdominal belts were not sufficient to prevent them from sustaining injuries over face and neck. Thus, oblique or cross belts as available in motor cars should be instituted in Airline services for safety of passengers.

2. Cabin Crew members should ensure that

service tables in front of passengers' seats are folded in their respective places during take off and landing. They should also ensure that safety belts are properly tightened and passengers are seated on their respective seats.

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