Laryngotracheal Reconstruction in Total Laryngotraheal Transection
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ABSTRACT
A case of laryngotracheal trauma (LTT) was brought to hospital in emergency. After securing airway, neck was explored and total laryngotracheal separation together with crushed anterior and posterior tracheal walls was found. Cricotracheal anastomosis and anterior tracheal wall was repaired with perichondrium lined rib graft. Recovery was good, required dilatation once without any serious postoperative complication in close follow-up.

Key words: Laryngotracheal trauma. Total laryngotracheal separation. Laryngotracheal reconstruction.

INTRODUCTION
Blunt LTT is a serious entity.1,2 It may be due to low velocity (blow over neck or manual compression) and high velocity trauma3 (as in motor vehicle, agricultural and industrial accidents). High velocity trauma usually results in fracture of laryngeal cartilages, crushed larynx or laryngotracheal disruption. These patients usually die at the scene of accident.

The presented case is of total laryngotracheal separation that was brought to hospital timely and laryngotracheal reconstruction (LTR) was done without any serious postoperative complication.

CASE REPORT
A 20-year-old married woman with one issue, belonging to a poor family was referred from Jehlum with tracheostomy tube inside for further evaluation. She was involved in high velocity blunt trauma. Her dupatta got caught into thresher machine while working in the fields. She became dyspnoic and tracheostomy was done at a private hospital where she was referred after 2 days.

At the time of examination, she was breathing quietly through tracheostomy tube but had cough due to aspiration. General physical examination was unremarkable. Neck was tender with bruises and rashes over the skin. There was subcutaneous emphysema and indirect laryngoscopy showed severe soft tissue edema inside. Fibreoptic endoscopy showed edema and vocal cords immobility (lateral position of cords). Cervical spine injuries were excluded by plain radiography of neck.

Next day, under general anesthesia rigid endoscopy was done. The bronchoscope passed beyond the cords failed to identify the tracheal rings and laryngotracheal disruption was suspected. Esophagoscopy was unremarkable.

Surgical exploration and LTR was immediately undertaken. Larynx was found 3-4 cm apart from trachea. The posterior tracheal wall was severely damaged and the anterior tracheal wall wall was deficient of tracheal rings. Three centimeters of trachea were resected out and the remaining damaged tracheal rings were reconstructed by inserting 4 cm perichondrium-lined rib graft (perichondrium inside, Figure 1). The posterior tracheal wall was repaired with meticulous stitching.

Cricotracheal anastomosis was done by dropping larynx in the neck. Stenting was provided with T-tube (Figure 2).

Antibiotics, steroids, H2 receptor blockers were given postoperatively. Patient was fed through nasogastric tube for 3 weeks. She was discharged after one month of operation with T-tube inside and was requested for regular follow-up.

After 3 months of operation, T-tube was removed and the fistula closed by itself within days. At that time, her voice was breathy but satisfactory. Fibreoptic laryngoscopy showed slight movement of vocal cords but the chink was adequate. Later on, rigid endoscopies
were carried out. A 6.5 mm bronchoscope was passed without any difficulty. There were no granulation tissues and graft was taken up successfully. Patient came after one month with complaint of dyspnoea on exertion. On rigid endoscopy, 4.5 mm rigid bronchoscope was passed easily and dilatation was done with 6.5 mm rigid bronchoscope. Patient was kept under observation for a week then discharged; she did not develop any complication in next 3 months follow-up and was requested for regular follow-up. Voice restoration procedures are being planned for her in the future.

DISCUSSION

LTT may result in life-long complications and even death if diagnosis and treatment is delayed. It has been reported to 1 in 5,000 emergencies in United States. It is the second most common cause of death after head injury among patients with head and neck trauma. Soft tissue injuries from high velocity blunt trauma may result in separation of trachea from cricoid, resulting in death at the site of accident but in rare cases, there is possibility of remaining enough lumen for breathing, patient could be shifted to hospital during this period. Diagnosis of LTT requires availability of clinical and radiological data. Overlooked diagnosis may lead to laryngeal stenosis. Two most common symptoms are respiratory distress and dyspnoea. Clinical findings are stridor, sub-cutaneous emphysema and loss of laryngeal landmarks. Imaging techniques (CT and MRI) may be helpful once the patient is stabilized. There is no need for CT scan, if immediate surgical exploration is required.

Initial management begins with securing airway by the most effective and practical means available, it can be secured by doing cricothyroidotomy, tracheostomy and endotracheal tube intubations. Each procedure has its own pros and cons. Examination could be done initially with fibreoptic endoscope, rigid pan endoscopy should be carried out later on. Although there is slight controversy regarding care, treatment in experienced hands results in favourable outcome. Mild trauma can be treated conservatively but severe ones require open surgical exploration and stenting. Surgical techniques may be in the form of mucosal stitching, covering of naked cartilage with graft, quilting of laryngeal spaces, resection of damaged tracheal rings, end to end anastomosis of trachea, cricotracheal and thyrototracheal anastomosis and reconstruction with rib graft. Sometimes more extensive procedures such as arytenoidectomy and even total laryngectomy may be required. In conclusion, successful treatment depends on early surgical intervention, minimal debridement, meticulous stitching, stenting, good postoperative care and close follow-up for several years.

REFERENCES