Case Report

Total Pharyngo-Supraglottic Separation Following Blunt Neck Trauma: A Case Report

Somchai Srirompotong MD*,
Thumnu Art-smart MD*, Supaporn Srirompotong MD*

** Department of Otolaryngology, Faculty of Medicine, Srinagarind Hospital, Khon Kaen University, Khon Kaen, Thailand*

Blunt laryngeal trauma is a rare, potentially life-threatening event. A man suffered total pharyngo-supraglottic separation following accidental strangling, when a long cloth hanging around his neck was tracked into a threshing machine. Difficulty maintaining the airway was the primary challenge since the laryngotracheal complex had collapsed into the mediastinum. The authors palpated the thyroid cartilage just above the sternal notch but could not identify the tracheal ring for tracheotomy. Injuries to the laryngotracheal complex are severe if there is such a complete separation. Early diagnosis and proper management reduce morbidity and mortality. The successful management of such a case is presented.

Keywords: *Wounds and injuries, Larynx, Neck injuries, Trachea, Wounds, Nonpenetrating*

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External laryngeal trauma occurs but rarely, compared to overall trauma cases[1]. A recent survey found that less than 1 in 14,000 patients visiting Emergency Services was a case of external laryngeal trauma[2]. The structure of the larynx is protected from external injury by the mandible superiorly, the sternocleidomastoideus laterally, and the clavicle inferiorly. Of all laryngotracheal traumas, approximately 60% are blunt[3,4] and a small proportion is the 'clothes-line' type injuries[5]. Complete laryngotracheal separation following blunt trauma to the neck is extremely rare[4,6-10]. Indeed, injury involving complete pharyngo-supraglottic separation has not ever been reported.

Case Report

A healthy 62-year-old man was working with a rice threshing machine. He was wearing a long swath of cloth around his neck for protection from the dust and exposure to the sun. The cloth was caught by moving parts of, and tracked into, the machine and the farmer was throttled by the tugging force. Fortunately, the cloth was ripped by the force so the farmer was not strangled to death; however, he had suffered a severe, internal avulsion injury. On arrival at the emergency department of the hospital, the farmer sat hunched forward. He was aphonic with mild biphasic stridor. He could not lie down because he could not breathe in a supine position.

On examination, a vague transverse contusion was visible, and subcutaneous emphysema audible-*cum*-palpable, over the front of the neck (Fig. 1). The thyroid cartilage was palpable at the level of the suprasternal notch. Oropharyngeal examination visualized the hanging proximal end of the pharynx at the level of the base of the tongue. Indirect laryngoscopy and fiberoptic endoscopy were performed, which revealed a total separation of the pharynx. The epiglottis could be seen but no other structures of the larynx were observable. An X-ray of the lateral neck showed a widening thyrohyoid space and the thyroid cartilage had dropped just above the sternal notch (Fig. 2).

The patient underwent an emergency tracheotomy under local anesthesia. Tracheal hooks were used to elevate the thyroid cartilage thus exposing the tracheal ring for tracheotomy. Direct laryngoscopy was then performed under general anesthesia. Total separation of the pharynx and supraglottis had

Correspondence to: Srirompotong S, Department of Otolaryngology, Faculty of Medicine, Khon Kaen University, Khon Kaen 40002, Thailand. Phone: 043-348-396, Fax: 043-202-490. E-mail: srirompotong@yahoo.com

Fig. 1 A vague transverse contusion was visible over the anterior neck (photograph taken after the tracheotomy)

Fig. 2 Lateral cervical X-ray shows widening of the thyrohyoid space and the thyroid cartilage (TC) dropped just above the sternal notch. HB represents the normal level of the hyoid bone

occurred at the level of the epiglottis. Hanging of the pharynx and epiglottis were seen at the proximal segments, but at the distal segments, only edematous mucosa could be identified.

The patient underwent open repair at the level of the thyrohyoid membrane. The distal end of the pharynx was identified and reconnected to the proximal end. The supraglottis was torn at the level of the false vocal cord and arythenoid, but the true vocal cord was normal and had full mobility. The distal part of the supraglottis was reconnected to the epiglottis at the proximal end.

A naso-gastric tube was retained post-operatively. The tracheotomy tube was decannulated two weeks after surgery. A direct pharyngocutaneous fistula developed post-operatively but closed spontaneously three weeks later. The patient had post-operative dysphagia and required training in supraglottal swallowing. The nasogastric tube was removed after the patient learned to swallow without gagging. The patient was discharged after two months convalescence.

Discussion

An external laryngeal trauma causing injury is rare, accounting for less than 1% of trauma cases seen by major centers[3,11]. When seen, the most common causes are traffic accidents, strangling, assaults, falls, or some other accidents[9]. The presented patient was a case of accidental strangling by a cloth caught in a piece of farm machinery. The throttling occurred at the thyrohyoid membrane level of the neck. The upper airway and pharynx were avulsed and driven posteriorly against the vertebral column with life-threatening consequences.

Successful management of laryngeal trauma begins in the emergency room. The diagnostic signs of laryngeal trauma are loss of normal anatomical landmarks, tenderness in the neck (especially above the larynx), crepitation, subcutaneous emphysema, dyspnea, hoarseness and skin abrasions[12,13]. The presented patient had symptoms of aphonia, tenderness of the neck, subcutaneous emphysema, thyroid cartilage palpable just above the sternal notch, and mild stridor. Indirect laryngoscopy and fiberoptic endoscopy visualized only the epiglottis and the hanging proximal end of the pharynx. The clinical examination and an X-ray of the lateral neck suggested a total pharyngeal and supraglottal separation.

The maintenance of an adequate airway is of primary importance. Orotracheal intubation can exacerbate a laryngeal injury, by creating a false passage due to the total disruption of the supraglottis, so is not recommended. Airway maintenance by tracheotomy, in the present case, was difficult because the cervical trachea had dropped into the mediastinum. Tracheal hooks were used to elevate the thyroid cartilage in order to expose the tracheal ring.

Pharyngeal perforation after blunt neck trauma is rare and the commonest cause is iatrogenic during instrumentation[14]. In the presented case, pharyngeal

separation occurred at the level of the base of the tongue, but it did not involve the cervical esophagus. After repairing the pharynx, the patient developed dysphagia, but aspiration was not problematic as the true vocal cord still had full movement.

Upon examination, the patient had lost the gag reflex and saliva was pooling at the postcricoid area and pyriform fossa. From these clinical findings, the dysphagia was probably caused by loss of sensation in the supraglottic region. Blunt neck trauma at the thyrohyoid membrane may injure the bilateral superior laryngeal nerve and cause loss of sensation at the supraglottic region. Training in supraglottic swallowing successfully treated the dysphagia.

In conclusion, complete pharyngo-supraglottic separation by blunt trauma to the neck is uncommon. Difficulty maintaining airway patency is the primary challenge. Follow-up training in supraglottic swallowing is necessary after formal repairs of the pharynx because of injury to the bilateral superior laryngeal nerve.

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ภาวะคอหอยและกล่องเสียงส่วนบนแยกจากกันทั้งหมดตามหลังการบาดเจ็บจากการกระแทกบริเวณคอ: รายงานผู้ป่วย 1 ราย

สมชาย ศรีร่มโพธิ์ทอง, ทำนุ อาจสมรรถ, สุภาภรณ์ ศรีร่มโพธิ์ทอง

การบาดเจ็บของกล่องเสียงจากการกระแทกพบได้น้อย แต่เป็นเหตุการณ์ที่อาจจะทำให้เสียชีวิตได้ รายงานนี้เป็นผู้ป่วยชายที่มีคอหอยและกล่องเสียงส่วนบนแยกจากกันทั้งหมด ซึ่งเกิดจากอุบัติเหตุผ้าขาวม้ารัดคอ โดยเกิดขณะเอาผ้าขาวม้าพาดคออยู่ บังเอิญผ้าขาวม้าเข้าไปติดในเครื่องจักรทำให้โดนผ้าขาวม้ารัดคอ ผู้ป่วยมีปัญหาการหายใจลำบาก การแก้ไขภาวะหายใจลำบากจะทำได้ยากและเป็นเรื่องท้าทาย เนื่องจากกล่องเสียงและหลอดลมจะหล่นลงไปอยู่ในช่องทรวงอก สามารถคลำกระดูกอ่อนไทรอยด์อยู่เหนือ sternal notch พอดี ไม่สามารถคลำหลอดลมได้ การประสบความสำเร็จในการรักษาผู้ป่วยได้แสดงไว้ในรายงานนี้