MANAGEMENT CHALLENGES IN A PATIENT PRESENTING WITH PENETRATING EXTERNAL LARYNGEAL TRAUMA AT UNIVERSITY HOSPITAL OF TREICHVILLE, COTE D'IVOIRE: CASE REPORT

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ABSTRACT

Penetrating external laryngeal trauma exposes the risk of laryngeal stenosis and speech dysfunction. Our objective was to present the difficulties of reconstructing the larynx after penetrating neck injury in our practice conditions. This was a 31-year-old adult without particular antecedent treated for external cervical trauma following attempted suicide. The lesion assessment revealed a loss of more than the average 1/3 of the thyroid cartilage associated with laryngeal and pharyngeal mucosal lesions. The lesions to the larynx were sutured; stenting of the larynx was made possible by placement of a nasotracheal tube. The suture and the nasotracheal intubation tube were not the best means for this situation. The poor economic condition of our patient and the lack of technical equipment couldn't allow the use of another option. Pharyngoplasty was performed using vicryl 3/0. Specialized psychiatric care was provided. The immediate post-operative period was marked by the persistence of the pharyngo-cutaneous fistula treated by maintaining the nasogastric tube. The nasotracheal tube was removed after 11 days. Resumption of speech and oral feeding was possible after 4 months. In conclusion, this laryngeal reconstruction inspired by our practice conditions proved to be effective.

Key words: External trauma, Larynx, Nasotracheal tube

INTRODUCTION

Trauma to the larynx is rare. It represents 1 case per 30,000 emergency cases in the USA and the second leading cause of death in cases of head and neck injuries[1]. Penetrating external laryngeal trauma is an emergency. Insufficient care exposes complications such as laryngeal stenosis. It can be prevented by airway stents if there is a large mucosal lesion or an unstable laryngeal fracture. The exclusive laryngeal stenting procedures are made using rolled Silastic® sheets, a Silastic® tube or a finger cot filled with gauze or sponge[2]. We are reporting a case of penetrating external laryngeal trauma following an attempted suicide by stabbing. The management required laryngeal reconstruction with limited technical equipment. The objective was to expose the difficulties of laryngeal reconstruction during management under our practice conditions.

CASE REPORT

This was a 31-year-old male patient residing in Ayahou (Aboisso region) with an unspecified history. He was referred to our department for penetrating neck injury following an attempted suicide with a bladed weapon (machete). The incident reportedly occurred at approximately 4 am on the same day. The patient reportedly presented with severe bleeding, prompting his evacuation to the regional hospital (Aboisso). After a compression bandage and an administration of anti-tetanus serum, he was sent to us the same day at 9 pm. On admission, the patient was conscious, restless, dysphonic with no evidence of respiratory distress or subcutaneous emphysema. His conjunctivae were pale. His blood pressure was 110/60mm of Hg and his respiratory rate was 19 cycles/minute and pulse rate 110 beats/mn. He received a 500ml blood transfusion, parenteral administration of amoxicillin-clavulanic acid 1g twice daily, methylprednisolone 120mg per day and paracetamol 1g three times daily. Isthmic tracheotomy and an initial assessment of the wound under general anaesthesia was performed. The patient was intubated first. Further surgical exploration nor debridement of damaged and infected tissue could not be completed due to the patient's haemodynamic instability. The lesion assessment revealed a decaying penetrating wound in zone II measuring 8cm diameter by 5cm. There was no active bleeding but there was presence of saliva and air bubbles. A guedel cannula was present within the wound. The damaged tissue consisted of a section of the muscles under hyoid bone, a loss of more than the average 1/3 of the thyroid cartilage, a section of the aryepiglottic folds, ventricular bands, lesions of the laryngeal mucosa and an opening of the left piriform sinus producing a pharyngostoma (Figure 1).

Figure 1: Wound in zone II of the cervical

Subsequently, a pharyngoplasty with vicryl 3/0 and insertion of a nasogastric tube was performed. A second surgical exploration under general anaesthesia 2 days after admission was performed. It made it possible to remove all damaged or infected tissues. The attempt to bring together the fragments of thyroid cartilage was made a bit under tension with a significant risk of laryngeal stenosis. We performed a laryngeal stenting using a nasotracheal tube. It was introduced through the right nasal cavity to above the tracheostomy opening (Figure 2).

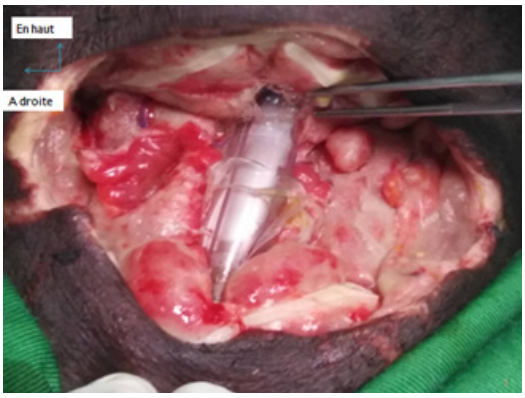

Figure 2: Laryngeal stenting using a nasotracheal intubation tube

The nasotracheal tube was attached to the right nostril wing using a 3/0 vicryl. Then a suture of the fragments thyroid cartilages under tension (Figure 3) and muscles under hyoid bone was performed using a 2/0 vicryl. The wound was sutured.

Figure 3: Suture of thyroid cartilage's fragments

On the fourth postoperative day, the patient presented with apharyngo-cutaneous fistula. Postoperatively, the medical treatment initiated was continued for 12 days. It had been combined with gentamicin for 5 days and local care for the pharyngo-cutaneous fistula. The nasotracheal tube was removed on the eleventh day postoperatively. Feeding was through a nasogastric tube. The patient was treated by the psychiatric department for delirium tremens. Closure of the pharyngo-cutaneous fistula and complete progressive decanulation of the tracheostomy cannula were achieved after 3 months as well as an improvement in his mental state. The patient resumed talking and eating. Follow-up nasofibroscopy revealed conservation of endolaryngeal structures and complete defect of the vocal cords (Figure 4).

Figure 4: conservation of laryngeal structure

DISCUSSION

The most frequently injured region of the neck is zone 2[3]. The vital structures of this affected area in our patient were the larynx and pharynx. This laryngeal injury was classified as stage IV according to the Schaefer – Fuhmann classification[4]. It is an anterior rupture of the larynx or unstable laryngeal fractures associated with massive edema, significant mucous lacerations, denudation of cartilage, laryngeal immobility, alteration of the respiratory tract of varying importance. It posed a problem of reconstruction of the laryngeal architecture while preserving the laryngeal functions. This injury assessment was obtained under general anaesthesia after nasotracheal intubation. Intubation should be preceded by assessing the integrity of the airways using fibre optic endoscopy. This prevents false-tract intubation, distortion of airway anatomy, disruption of soft tissue injury and respiratory arrest[5]. This was not possible under our working conditions because we did not have a fibre optic endoscopy in our possession. We might have exposed our patient to a worsening of his laryngeal injury. On the other hand,

other authors recommend a first attempt at intubation and recourse to tracheostomy if the latter fails[6].

In our situation, the reconstruction of the architecture required a tracheotomy to supplement the respiratory function of the larynx. For the repair of thyroid cartilaginous lesions, different means are used including sutures, steel threads, mini-plates and "APF" plates (adaptation flat fixation). The mini plates and "APF" plates provide immediate and lasting rigid stability of the laryngeal structure with restoration of the airway of the larynx[2,7]. They make it possible to reduce the calibration indications. The suture wasn't the best mean for this situation. But we used sutures that were available to us. The significant loss of part of the thyroid cartilage exposed the threads to tension with the risk of severing. The airway stents was indicated in our patient in agreement with the management based on the Schaefer – Fuhmann classification[8]. The endolaryngeal guardian wasn't available in our context. The low economic condition of our patient couldn't allow to buy it from a foreign country. It would take so much time to do it. In the absence of an endolaryngeal guardian, we have placed a nasotracheal tube to play this role. It stabilized the entire repaired laryngeal structure and prevented laryngeal stenosis. The duration of the maintenance of this probe was close to that recommended in the literature, ie no more than 15 days otherwise it could behave like a foreign body, promoting infection and granulation[9]. The delay in the management of pharyngeal lesions caused suppuration in our patient immediately after the operation. This suppuration could cause a section of the sutures of the thyroid cartilages. Indeed, Bladergroen *et al*[10] observed that surgical management of pharyngo-oesophageal trauma within 24 hours resulted in 92% survival. After 24 hours, the survival rate decreased to 67% and was not significantly influenced by the type of treatment. This observation is shared by Velmahos *et al*[11]. They reported no mortality directly related to the lesions in 108 patients operated on within 24 hours out of 119 patients presenting with traumatic perforations of the pharynx and esophagus. In contrast, among 11 patients taken more than 24 hours later, 4 of them (36%) had died from uncontrolled sepsis. In our case the mental state of the patient made it difficult to provide local care for the pharyngo-cutaneous fistula and asepsis essential for healing. This justified a hospitalization of 4 months. The evolution of the injury was marked by the resumption of the various laryngeal functions and that of the pharynx reflecting the conservation of the affected organs.

CONCLUSION

Penetrating laryngeal trauma presents a complex injury and requires high level of surgical expertise and resources. However, repair, reconstruction and good outcomes are possible in low resource settings using a firm foundation in surgical technique and locally available material.

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