

**IMPROVING THE DIAGNOSTICS OF INJURIES TO THE LARYNX AND TRACHEA
AFTER BLUNT NECK INJURY**

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Abstract: We examined and treated 39 patients after blunt neck trauma. In addition to the general clinical examination, an endoscopic examination of the larynx and trachea was carried out, as well as multi-slice computed tomography of the neck organs with three-dimensional reconstruction of the cartilage of the larynx.

Key words: Laryngeal injury; tracheal injury; computed tomography of the larynx; three-dimensional reconstruction; laryngeal stenosis; reconstruction of the larynx and trachea.

INTRODUCTION

Recently, patients with blunt neck injuries, accompanied by damage to the structures of the larynx and cervical trachea, have become increasingly common. Such injuries can cause severe impairment of the patient's health, often leading to fatal complications or varying degrees of disability. Characteristic signs of traumatic lesions of the larynx and trachea when their integrity is damaged are swelling of the soft tissues of the neck, changes in the shape and position of the cartilage of the larynx, impaired swallowing and breathing, hemoptysis, subcutaneous emphysema [1–3].

MATERIALS AND METHODS

When providing medical care to such victims, it is first necessary to normalize breathing, stop bleeding and take measures to prevent traumatic shock. It is extremely important to carry out timely diagnosis of damage, in which computed tomography and endoscopic examination of the larynx and trachea play an important role. If proper assistance is not provided in a timely manner, this leads to severe organic and functional disorders of the organ [4].

In the period from 2019 to 2023, we examined and treated 39 patients after blunt neck trauma of various etiologies (Table 1) with damage to the larynx and trachea. Among them there were 29 men and 10 women of working age, from 19 to 60 years.

All patients underwent a general clinical examination, including laboratory, physical, instrumental examination methods, endoscopic examination and multi-slice computed tomography of the larynx and trachea.

Videolaryngoscopy was performed using a rigid telarlaryngopharyngoscope from Karl Storz with built-in Hopkins optics with a viewing angle of 90°, 4x magnification. Fibrolaryngotracheoscopy was performed using a flexible endoscope from Karl Storz with a working length of 23 cm and a diameter of 5.2 mm. The image was displayed on a monitor and recorded on a multimedia player with digital media.

Multislice computed tomography (MSCT) was performed on a 160-slice Toshiba Aquilion Prime device. When processing the data obtained, axial sections and multiplanar reformations in the sagittal and frontal planes were assessed. The vocal cords were detailed, their symmetry, contours, thickness, structure were identified, the presence of wall seals and the condition of the cartilage of the larynx and trachea were assessed. Three-dimensional

reconstructions contributed to a more visual graphical representation of the localization and extent of organ damage.

RESULTS AND DISCUSSION

Based on the results of the examination, patients were divided into three subgroups depending on the severity of damage to the larynx and trachea.

A mild degree of damage in the form of bruises without violating the integrity of the walls of the larynx and its anatomical structure was determined in 9 patients. During endoscopic examination, 4 patients revealed thickening of the vocal folds with hemorrhage into their thickness, 4 patients had a unilateral hematoma of the aryepiglottic fold, 1 patient had a hematoma of the vocal folds with a transition to the subfolding space.

Table 1

Distribution of patients with traumatic injury to the larynx and trachea by etiological factor (n = 39)

Cause of injury	Number of patients	Gender	
		Male	Female
Car accident	13	9	4
Punch to the neck area	10	8	2
Injury to the larynx and trachea as a result of a fall	7	6	1
Sports injury	5	4	1
Attempted strangulation	4	2	2
Total	39	29	10

Injuries of moderate severity in the form of fractures of the cartilage of the larynx without significant destruction and separation of individual anatomical structures of the larynx with mild impairment of its functions were identified in 19 patients (Table 2).

Table 2

Post-traumatic changes in the larynx of moderate severity (n = 19)

Nature of damage	Number of
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Fracture of the thyroid cartilage	5
without displacement	
Fracture of the thyroid cartilage	10
with displacement	
Fracture of the cricoid cartilage	2
Detachment of the superior horn of the thyroid cartilage	2

The bulk of the damage (17 out of 19) occurred to the thyroid cartilage with a violation of its integrity.

Severe injuries in the form of extensive fractures and crushing of the cartilage of the larynx and trachea were detected in 11 cases. Upon admission, all patients had a clinical picture of decompensated stenosis of the larynx and trachea, hemoptysis, and impaired swallowing. Due to the threat of asphyxia, they underwent an urgent tracheostomy.

CONCLUSION

1. In case of acute neck injury, multislice computed tomography in 100% of cases provides the opportunity to determine the nature of damage to the larynx and trachea, justify the indications and scope of surgical larynx - tracheal reconstruction.
2. The developed therapeutic and diagnostic algorithm for the management of patients with acute trauma to the larynx and trachea, including multi-slice computed tomography with three-dimensional reconstruction and endofibrolaryngotracheoscopy, allows There are positive treatment results in 95% of cases.

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