Rom J Leg Med [26] 16-20 [2018]
DOI: 10.4323/rjlm.2018.16

Self-inflicted laryngeal penetrating wounds with suicidal intention: two clinical cases

Daniela Vrînceanu[1,,**], Bogdan Bănică[1,**], Raluca Papacocea[2,**], Toma Papacocea[3,**]*

Abstract: Laryngeal opened trauma through cut penetrating wounds represent a major emergency due to the risk of inundation of the airways and the haemorrhagic shock secondary to large neck vessels damage. Emergency surgery is mandatory and the aims are the control of haemostasis, lower airway protection, and the restoration of the laryngeal continuity.

We present two clinical cases of laryngeal penetrating wounds by self-aggression. The first case is a 26-year-old, hallucinogenic substances consumer. The second case is a 43-year-old man with paranoid schizophrenia. In both cases the thyroid membrane was injured. We present therapeutic attitude and complications in evolution. We are discussing about emergency surgery in situations when the patient cannot express his or her valid written consent, forensic, ethical and psychological aspects in self-injured patients.

Key Words: Informed consent, medical facilities, ethics, patient, healthcare professional.

INTRODUCTION

Cutting the throat is not a commonly used method for committing a suicide act. Homicidal cut throat lesions are more frequent in most of the countries. The most important task for the forensic expert is to distinguish between suicide and homicide in the case of neck wounds [1]. Accidental cervical wounds can be seen in road traffic accidents or in falls, when such injuries are produced by glass fragments. A study conducted in Finland found an 1.3 cases/100000 inhabitants/year incidence for penetrating neck injuries. Among this patients 61% are victims of aggressions, 38% have self-inflicted wounds and only 6% are involved in accidents [2].

Anatomy

The cervical region presents several vital anatomical elements, like the jugular and carotid axes, but also to the aerial and digestive visceral axes (the laryngeal tracheal axis and the pharyngo-oesophageal axis) [3]. Cervical penetrating wounds are major emergencies by injuring vascular axes with hemorrhagic shock secondary to massive hemorrhage. Penetration at the laryngeal tracheal axis presents the major risk of blood aspiration into airways [4]. Even in case of open injuries, the possibility of having an unstable cervical vertebral fracture must be considered.

Management

Emergency surgery is mandatory and should focus to control the hemostasis, to restoration the

1) Emergency University's Hospital, ENT Department, Bucharest, Romania
** Corresponding author: MD, PhD, ENT surgeon, Coordinator of ENT Department, Emergency University Hospital of Bucharest, 169 Independentei Avenue, 5th sector, 050 098 Bucharest, Romania, Tel: +4021-318 05 22/446, Fax: +4021-318 05 54, E-mail: vrinceanudana@yahoo.com*
2) "Carol Davila" University of Medicine and Pharmacy, Department of Physiology, Bucharest, Romania
3) "Carol Davila" University of Medicine and Pharmacy, Neurosurgery Department, "St. Pantelimon" Emergency Hospital, Bucharest, Romania
*** All authors contributed equally to this work.*

laryngeal continuity and to protect the inferior airways [5]. The first priority is to establish a secure airway. Endotracheal intubation is the first step, but sometimes it is not possible to maintain it for a long period of time, in laryngeal wounds. The tracheotomy of necessity is mandatory to protect the traumatized larynx and to allow the remission of the laryngeal edema. The suppression of tracheostomy should be done as quickly as possible to avoid laryngo-tracheal stenosis [6]. The second priority is to arrest the hemorrhage. External bleeding is controlled by direct pressure. Sometimes, emergency ligation of the ipsilateral external carotid artery can be necessary.

Penetrating wounds of the thyroid membrane, at the entrance to the pyriform sinus, may result in the occurrence of a salivary fistula [7]. It is mandatory to suture the thyroid membrane and to insert a nasogastric tube under intraoperative control. The nasogastric tube should be maintained for 10-14 days and should be removed after a pharyngo-esophageal transit performed, with a sterile, water-soluble contrast substance, to exclude a salivary fistula. The healing of injuries involves patient compliance with treatment, lack of oral nutrition, and head slightly flexed to anterior [5, 6].

Mechanical protection of the cervical spine before excluding a vertebral fracture can be considered in deep wounds but this can jeopardize the control of bleeding and make the maintenance of the airway a more difficult task [1].

CASE SERIES

Case 1

A 26 years old male patient, with cervical trauma by self-aggression with a sharp knife, under the influence of hallucinogenic substances, was brought to the emergency room by friends. He presented a horizontal left cervical wound, approximately 8 cm long, in the middle third of the neck, penetrating in the pharyngo-larynx, with transfixing wound at the level of the thyrohyoid membrane and the lesioning of superior left laryngeal pedicle. Oro-tracheal intubation and hemostasis were performed in collaboration with the vascular surgeon, followed by suture of the left sternocleidomastoid muscle and suture of left thyrohyoid membrane lesion (approximately 4 cm continuous suture).

The patient was admitted in intensive care unit (ICU) hemodynamic and respiratory stable, with protective oro-tracheal intubation. Tracheostomy of necessity was performed in less than 24 hours after admission to allow the remission of laryngeal edema (Fig. 1). We put in place a rhino-gastric tube. The patient remained in ICU where he was monitored daily. Psychotropic treatment was given after psychiatrist's indication because the patient was agitated and did not tolerate bandages.

On the 10th day, possibly in the context of withdrawal of psychotropic substances, the patient became agitated, pulled out the tracheal cannula and fed himself orally. Cannula was reinstalled.

On day 11, a left sensitive, lateral cervical lump occurred, with sub fever in the evening so that on day 12 a cervical ultrasound showed a mixed echogenic structure of 43/18 mm relative to the wound. Surgically intervention was reinitiated, under local anesthesia and intravenous sedation and analgesia. A collection of apparently infected saliva, located at the bottom of the left SCM, fused to the cricoid, was evacuated. The wound remained open, with betadine soaked gauze.

Slightly favorable progression with healing per secondam, suppression of tracheostomy at 7 days after the second intervention and biological inflammatory syndrome remission at 10 days occurred.

The patient was non-compliant during hospitalization, despite the psychotropic treatment and daily psychotherapy - he smoked and continued to feed himself orally. On day 27, 14 days after the second intervention, patient was afebrile, with a supple throat, closed tracheostomy and almost completely closed

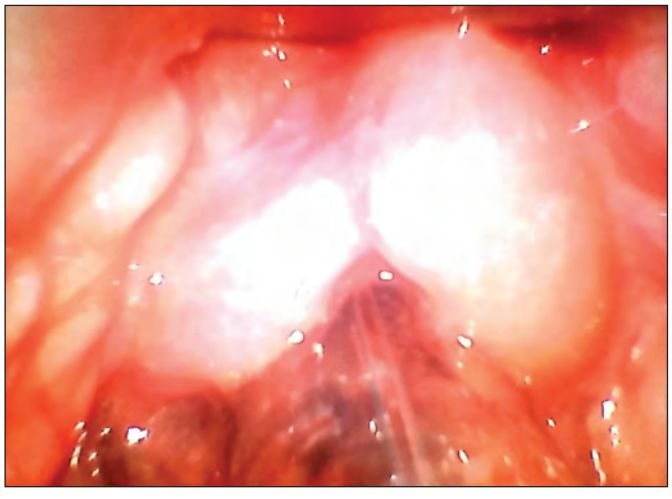

Figure 1. Intraoperative endoscopic appearance with major edema of the laryngeal vestibule around the intubation tube.

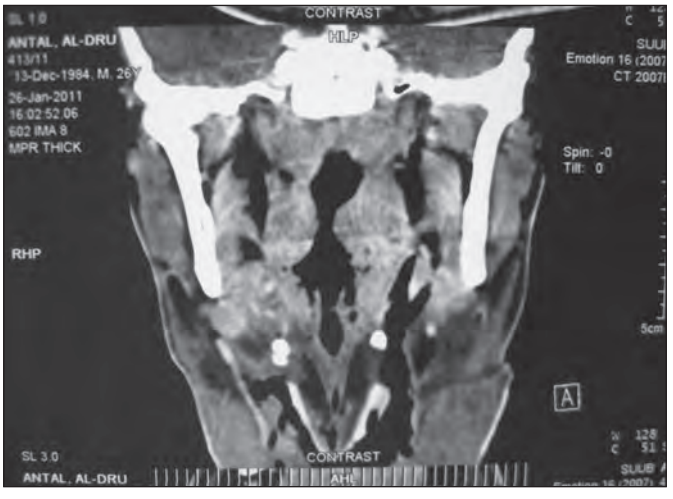

Figure 2. CT cervical scan with bilateral cervical emphysema without left lateral cervical latent collections.

cervical wound.

The rhino-gastric tube was removed and the patient was discharged with the recommendations: referral note to psychiatry - "Alexandru Obregia" Psychiatric Hospital Bucharest, given by the psychiatrist along with the prescription for psychiatric specialty treatment, semisolid diet, and control at 7 days or at request.

Case 2

A 43-year-old patient was brought from home by ambulance, with a straight lateral-cervical wound, produced by self-aggression with a sharp knife. The patient was known to have a mental illness, with repeated admissions to "Alexandru Obregia" Psychiatric Hospital (without medical records). He presented arterial bleeding, hemorrhagic shock and acute respiratory failure due to cutting of the thyroid membrane and massive blood flooding into the respiratory tree.

Emergency surgery was performed under general anesthesia with oro-tracheal intubation and arterial suture. Surgical wound exploration, supplemented with direct fiber optic laryngoscopy, revealed a right thyroid membrane wound which was sutured (Figs 4-6). Cervical aspiration drainage was installed. It was decided to maintain oro-tracheal intubation and cortisol treatment to reduce laryngeal edema, the patient being admitted in the ICU.

At 72 hours, extubation was decided: no dyspnea appearance. On day 10 of admission, a pharyngo-esophageal transit with iomerone (a sterile water-soluble contrast substance) was performed which revealed a minimal right fistula on the right side.

The feeding on the nasogastric tube was kept and the radiological examination was repeated after another 3 days, leading to the closure of the pharyngeal fistula. Repeated psychiatric consults were requested during admission, which resulted in treatment with Diazepam, Haloperidol, Tiapridal, Carbamazepine and Imovane. The psychiatric diagnosis was paranoid schizophrenia. The patient was relatively compliant with treatment and medical maneuvers.

After discharge he was directed to the "Alexandru Obregia" Psychiatric Hospital. Soft food at room temperature, avoiding of spices, alcohol, rough foods, control over 1 month were recommended.

DISCUSSION

Suicide is one of the first three causes of death at people between the ages of 15 and 34 throughout the world. According to WHO, almost one million people commit suicide annually and 20 times more try to commit suicide. An overall mortality rate is 16 to 100,000 [8]. The incidence and pattern of suicide differs from one geographic region to another due to religious and cultural particularities. Cut neck lesions with a sharp instrument are the least frequent method of suicide [9]. A typical self-inflicted cut throat is oblique, starting superiorly on the left side of neck, in right- handed persons, and terminating inferiorly on the right side. The incision is deeper at the beginning and becomes shallower as it crosses the throat [1]. Agnihotri [10] stated that suicidal wounds are usually incised while in cases of homicide the wounds are more often stabbed. The difference between incised and stab wounds is that the former are generally wider than deep and the latter are usually deeper than wide [11] Cut throat extending deep to the cervical vertebrae is more suggestive for a homicidal lesion [12].Self-inflicted neck wounds are usually long, with regular edges because the head has the tendency to be thrown back in the moment of cutting. For the same

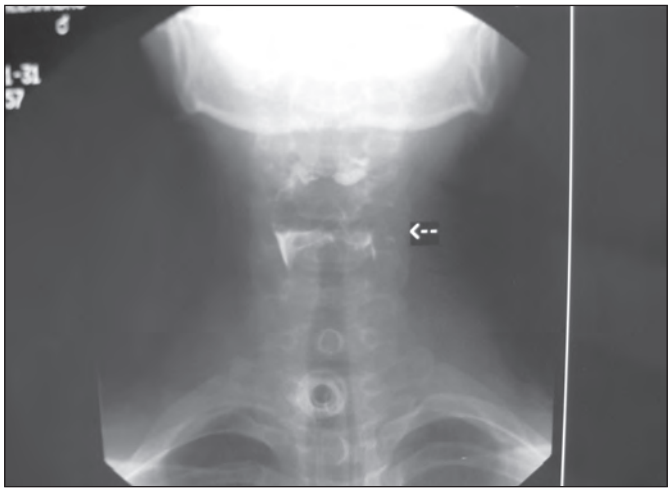

Figure 3. Pharyngeal-esophageal transit with gastrographin - fistulous left lateral cervical tract.

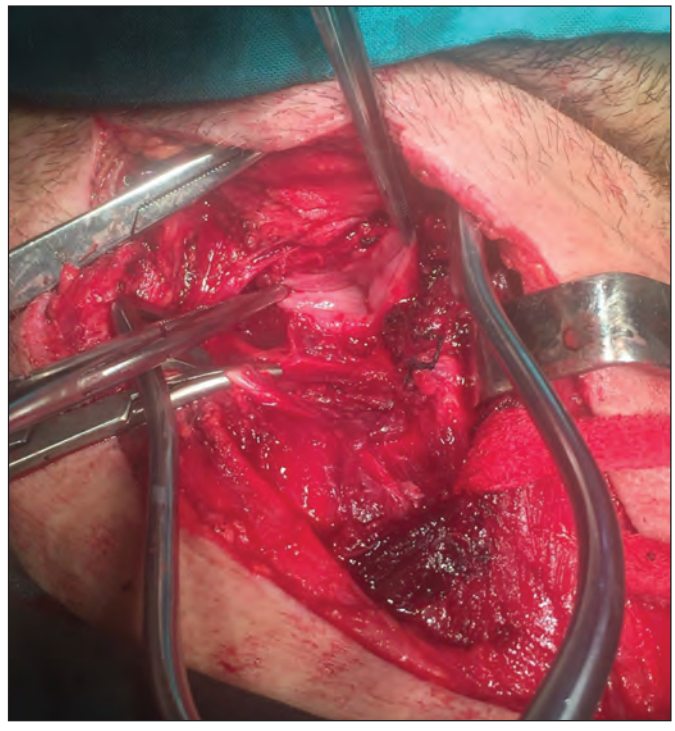

Figure 4. Intraoperative aspect with lesion in the right thyrohyoid membrane.

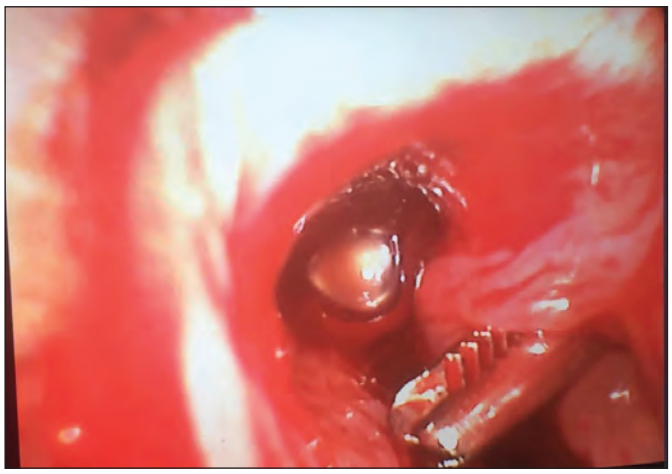

Figure 5. Intraoperative endoscopic aspect by video-laryngoscopy with evidence of a lesion in the right thyrohyoid membrane.

reason the great vessels escape injury. Associated with the main wound, almost always in suicidal injuries, we will find several small, shallow cuts named tentative cuts or hesitation marks, indicating repeated attempts stopped because of pain or fear before the final cut [13]. Suicide by cutting the throat without hesitation is very rare [14] Superficial scars are commonly present on other parts of the body, usually at the wrists and forearms, from previous suicide attempts or self - harming behaviour. Another typical aspect of self-inflicted lesions is that they are usually found in areas not covered by clothes [1, 13].

In the presented cases there were also several hesitation wounds but, being very superficial, they did not pose surgical problems. The first patient presented also old cuts on his forearms, suggesting more a self-harming behaviour rather than other suicidal attempts. The hypothesis of self-aggression is plausible in both cases, in the first case due to the consumption of hallucinogenic drugs, and in the second in the context of a mental illness.

Causes of death following neck wounds include :

- exsanguination due to lesioning of blood vessels, especially the carotid artery or the jugular vein
- asphyxiation due to blood aspiration in the respiratory tract
- air embolism due to the opening of one or both jugular veins (external and internal)
- acute central cardiac arrest due to lesioning the medulla oblongata or upper cervical spinal cord (rarely, in very deep lesions, mostly stabbed) [9, 11, 15].

One can observe that the first three causes are consequences of severe hemorrhage. Fortunately, in our two cases, there were no lesions of the great vessels in the neck and, although the patients suffered important blood loss from their quite deep wounds and were brought in shock at the hospital, they were not beyond therapeutical possibilities to save them and rapid and active maneuvers allowed the medical team to stop the bleeding and to secure the airways.

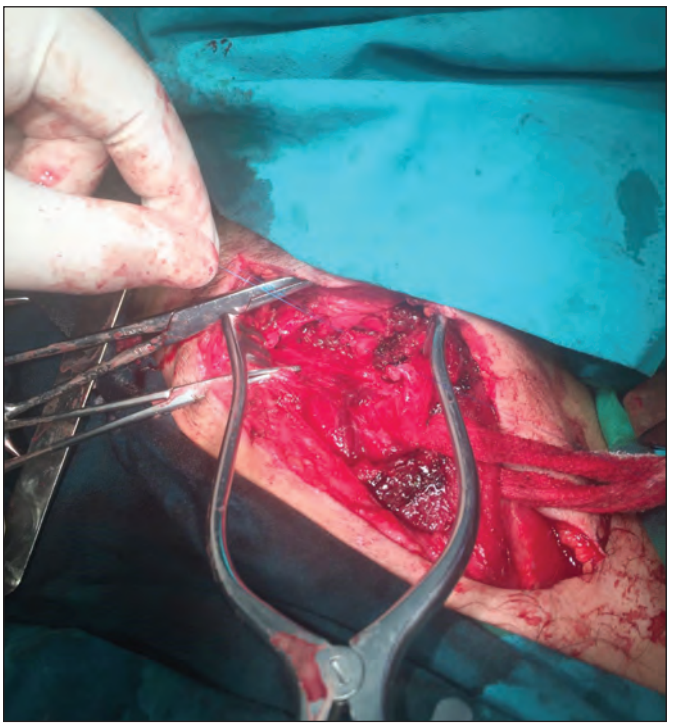

Figure 6. Intraoperative aspect of the cervical wound after suture of the thyrohyoid membrane.

Ethical issues

In both cases, expressing and signing consent for surgery was not possible for several reasons: firstly because of the hemorrhagic shock, secondly because of the difficulty of assessing the discernment under the conditions of a vital emergency medical situation. In both cases, the internal procedure for the establishment of a multidisciplinary surgical emergency commission was applied. The procedure provides for 3 different specialists who decide emergency surgical indication in the patient's vital interest. In both cases there were an otorhinolaryngology (ENT) surgeon, oral and maxillofacial surgeon (OMF), vascular surgeon and intensive therapy specialist.

Taking into account the psychomotor agitation in both cases, the bounding procedure was also applied, at the indication of the psychiatrist and the attending physician ENT, for a limited duration of 2 hours, with the psychological counseling of the patients. In the first case, due to lack of treatment compliance, after the immobilisation period, the patient pull out the nasogastric tube and cannula. In the second case, the patient removed his nasogastric tube outside of the contention period, requiring replacement of the tube.

Daily psychiatric counseling and psychological counseling are mandatory in the management of these types of patients [16]. In the second case, the constant presence of a brother had a beneficial influence on the patient.

In some situations, like in our first case, the patient continues to have a self-harming behaviour, even after the acute phase of clinical emergency. The physician, in close cooperation with the psychiatrist,

should consider this patients as having an impaired decision-making capacity and, taking this into account, to decide the best therapeutic attitude, even in cases when he cannot obtain an informed consent. In this situations the appropriate therapeutical attitude can be based upon presumed consent, which is defined as what a reasonable person found in the same circumstances would accept to receive [17].

CONCLUSIONS

We presented two clinical cases of self-aggression, with penetrating cervical wounds of the neck complicated by hemorrhagic shock and laryngeal injuries. The emergency surgery saved the patients lives. Daily psychiatric and psychological counseling are mandatory to ensure compliance with treatment. Patients should be monitored carefully to prevent self-harming behaviour. Family support is useful in most cases. In situations requiring emergency surgery, the internal procedures of the hospital must be followed and respected, the primary purpose being always to save the patient's life.

Conflict of interest. Authors have declared that no competing interests exist.

Ethical approval. All authors hereby declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

Acknowledgment. We would like to acknowledge the contribution of dr. Ioana Eftime, ENT specialist in treatment and healing of the second clinical case presented.

References

1. Sudarshan S, Patil Baliram PR, Sunil D, Vidhate G, Tyagi S. An atypical case of suicidal cut throat injury Egyptian Journal of Forensic Sciences. 2016 Dec; 6(4):492-495.
2. Pakarinen TK, Leppäniemi A, Sihvo E, Hiltunen KM, Salo J. Management of cervical stab wounds in low volume trauma centres: systematic physical examination and low threshold for adjunctive studies, or surgical exploration. Injury. 2006; 37(5):440-447.
3. Cummings. Laryngeal Injury. Otolaryngology: Head & Neck Surgery, 4th ed. Mosby, Inc, 2005: 4223-4238.
4. O'Mara W, Hebert F. External laryngeal trauma. J La State Med Soc, 2000; 152(5): 218-222.
5. Hwang SY. Management dilemmas in laryngeal trauma. The Journal of Laryngology & Otology, 2004; 118(5):325 –328.
6. Goudy SL, Miller FB, Bumpos JM. Neck Crepitance: Evaluation and Management of Suspected Upper Aerodigestive Tract Injury. Laryngoscope, 2002; 112(5): 791-795.
7. Jović R. Suicidal knife injuries of the neck (abstract), Med Pregl. 1996;49(7-8):308-312.
8. Shetty BSK, Padubidri JR, Bhandarkar AM, Shetty AJ, Shetty M. "Atypical suicidal" cut throat injury – a case report. J Forensic Leg Med, 2009; 16(3): 492–493.
9. Solarino B. Suicidal cut-throat and stab fatalities: three case reports. Rom J Leg Med. 2011; 19(3): 161-166 '
10. Agnihotri AK, Agnihotri AK, Choudhury T, Millo OP. Murty. Sharp force fatalities – 3 year review.Int J Med Toxicol Legal Med.2001. 3(2):18-20.
11. Brunel C, Fermanian C, Durigon M, de la Grandmaison GL. Homicidal and suicidal sharp force fatalities: autopsy parameters in relation to the manner of death. Forensic Sci Int. 2010.198 (1–3):150-154.
12. Ozdemir B, Celbis O, Kaya A. Cut throat injuries and honor killings: review of cases in eastern Turkey. J Forensic Leg Med. 2013 May: 20 (4):198-203.
13. Racette S, Kremer C, Desjarlais A, Sauvageau A. Suicidal and homicidal sharp force injury: a 5-year retrospective comparative study of hesitation marks and defence wounds.Forensic Sci Med Pathol. 2008; 4 (4): 221-227.
14. Chadly A, Marc B, Paraire F, Durigon M. Suicidal stab wounds of the throat. Med Sci Law. 1991; 31:355–356.
15. Fukube S, Hayashi T, Ishida Y, Kamon H, Kawaguchi M, Kimura A, Kondo T. Retrospective study on suicidal cases by sharp force injuries. J Forensic Leg Med, 2008 Apr; 15(3):163–167.
16. Jose MB, Alexandra F, Diego DL, Danuta W. Suicide and mental disorders – do we know enough ?. Br J Psychiatry, 2003; 183:382–383.
17. Jesus J, Rosen P. Ethical problems in emergency medicine. 11th ed. Oxford: John Wiley&Sons Ltd ; 2012.