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Mesenteric Injury as a Complication of the Heimlich Maneuver: An Autopsy Case Report

Heimlich Manevrasının Bir Komplikasyonu Olarak Mezenter Yaralanması: Bir Otopsi Olgu Sunumu

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Öz

Gıda vb. yabancı cisimler nedeniyle üst solunum yolunun tıkanması durumunda uygulanan Heimlich manevrası ilk kez 1974 yılında Dr. Henry Heimlich tarafından tanımlanmıştır. Mevcut manevranın güncel ve uygulanır olması sebebiyle oluşabilecek komplikasyonlarının otopsi olgularında vurgulanıp tartışılmasının önemi açıktır. Çalışmamızda Heimlich manevrasının nadir travmatik komplikasyonlarından olan mezenter yaralanması saptanan otopsi olgusunun bulguları paylaşılacaktır. 65 yaşında erkeğin kaldığı engelli bakımevinde yemekhanede öğle yemeğini yedikten sonra boğulur vaziyette morardığı ve zor nefes aldığı bildiriliyor. Bakımevi hemşiresi tarafından Heimlich manevrası yapılarak, ağızdan et ve ekmeğin parçaları çıkarılıyor. İki günlük yoğun bakım yatışı sırasında endotrakeal tüp içi sindirilmiş et parçaları aspire ediliyor ve arrest olması neticesinde CPR uygulanıp exitus kabul ediliyor. Yapılan otopside iç muayenede Heimlich manevrasının bir komplikasyonu olarak mezenterde yüzeysel laserasyon ve kanama alanı saptandı. Mezenterde yapılan histopatolojik inceleme kanama ve yırtığı doğruladı. Ölümün gıda aspirasyonuna bağlı mekanik asfiksi ve gelişen komplikasyonlar neticesinde meydana geldiği yönünde görüş bildirildi. Heimlich manevrası uygulanan adli otopsi olgularında adli tıp uzmanı oluşabilecek tüm komplikasyonları göz önünde bulundurmalı, artefaktlar açısından doğru ayırıcı tanı ve bu lezyonların ölüme rolü bulunup bulunmadığı konusunda doğru değerlendirme yapmalıdır. Bu yaklaşım ölüm sebebi ve orjininin doğru tespit edilmesinin yanı sıra başka birçok medikolegal problemi de önleyebilecektir.

Anahtar Kelimeler: Heimlich manevrası, Mezenter yaralanması, Adli otopsi

Abstract

The Heimlich maneuver, used in cases of upper airway obstruction due to foreign objects such as food, was first described in 1974 by Dr. Henry Heimlich. Given that the current maneuver is up-to-date and applicable, it is clearly important to highlight and discuss its complications in autopsy cases. Our study will share the findings of an autopsy case in which mesenteric injury, a rare traumatic complication of the Heimlich maneuver, was detected. A 65-year-old man staying at a nursing home for the disabled reportedly turned blue and had difficulty breathing after eating lunch in the dining hall. The nurse performs the Heimlich maneuver, removing pieces of meat and bread from the mouth. During a two-day intensive care admission, digested meat fragments are aspirated from the endotracheal tube, and following cardiac arrest, CPR is administered and death is confirmed. During the autopsy, superficial laceration and hemorrhage in the mesentery were detected as a complication of the Heimlich maneuver. Histopathological examination of the mesentery confirmed hemorrhage and tearing. It was reported that death occurred as a result of mechanical asphyxia due to food aspiration and subsequent complications. In forensic autopsy cases where the Heimlich maneuver was performed, the forensic medicine specialist must consider all possible complications. They must make an accurate differential diagnosis regarding artifacts and correctly assess whether these lesions played a role in death. This approach will prevent many other medicolegal problems in addition to accurately determining the cause and origin of death.

Keywords: Heimlich maneuver, Mesenteric injury, Forensic autopsy

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INTRODUCTION

The Heimlich maneuver was first described in 1974 by Dr. Henry Heimlich (1). In cases of upper airway obstruction due to food or other foreign objects, this procedure can be performed by anyone knowledgeable about it without the use of special equipment (2-4). To perform the maneuver correctly, the rescuer should stand behind the choking person, who should lean forward slightly. The rescuer then places their fist just above the person's abdomen and below their ribs, ensuring that the thumb or radial side of the first knuckle touches their abdomen. Then he grips his fist with his other hand and makes quick upward thrusts at a 45-degree angle. This movement helps expel the foreign object by raising the diaphragm and increasing intrathoracic pressure (5,6).

Although there are various studies in the literature (2-5) on complications of the Heimlich maneuver, the importance of emphasizing and discussing this topic in autopsy cases is clear, given that the current maneuver is up-to-date and applicable in cases of obstruction by foreign bodies such as food.

The aim of our study is to raise awareness of this issue and contribute to the existing literature by presenting the findings of an autopsy in which a rare traumatic complication of the Heimlich maneuver, namely mesenteric injury, was identified.

CASE

This study was conducted with the approval of the Scientific Research Commission of the Council of Forensic Medicine (Date: February 10, 2026, Decision No: 21589509/2026/115) and was carried out in accordance with the principles of the Declaration of Helsinki.

According to an investigation by the Office of the Chief Public Prosecutor, a 65-year-old man, who was 162 cm

tall, and weighed 95 kg, whose current medical records indicate no chronic illnesses other than atypical psychosis, reportedly turned blue and struggled to breathe while choking in the corridor after eating lunch in the dining hall of the care home for disabled people where he was staying. The nurse from the nursing home performed the Heimlich maneuver to remove pieces of meat and bread from the patient's mouth. Cardiopulmonary resuscitation (CPR) was administered and the 112 emergency medical services were notified. The emergency medical team intubated the individual and transports him to the intensive care unit, performing CPR for 20 minutes en route. During two days of intensive care monitoring and treatment, fragments of digested meat were aspirated from the endotracheal tube. Following the person's cardiac arrest, CPR was administered for 30 minutes before death was confirmed.

External examination during the autopsy revealed no traumatic lesions that could have caused death. However, needle puncture marks consistent with possible medical intervention, a 3x1.5 cm hemorrhage on the lower lip and a 10x10 cm abrasion on the front of the chest below the sternum with intact tissue in between were detected.

During the internal examination, hemorrhage was observed in the soft tissues around the upper trachea and the greater horn of the hyoid bone. Hemorrhage was also present in the soft tissues beneath the chest skin and over the pericardium. Fractures associated with hemorrhage were present in the sternum and on both sides of the ribs in the parasternal and midclavicular regions. A total of 50 cc of blood was found in the right pleural cavity, and 150 cc in the left. Subcapsular haemorrhage was found in the capsule of the left liver lobe, as well as a 7x1.5 cm laceration, a 6x3 cm superficial laceration in the mesentery and a 3.5x2.5 cm haemorrhagic area (see Figures 1-2). No major traumatic lesion contributing to death was identified.

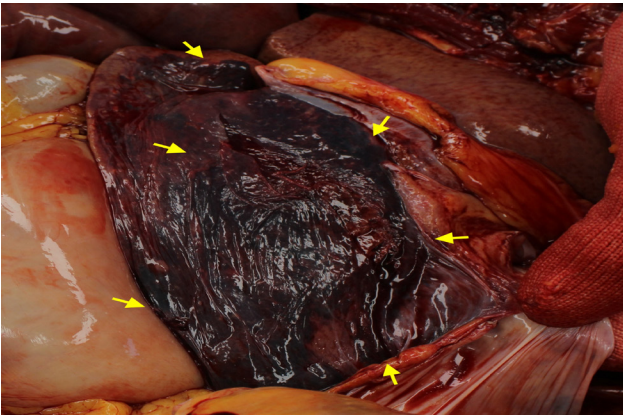


Figure 1. Liver capsule laceration and subcapsular hemorrhage associated with Cardiopulmonary Resuscitation



Figure 2. Laceration and hemorrhage in the mesentery caused by Heimlich maneuver

Histopathological examination of the mesentery confirmed hemorrhage and tearing. Toxicological analysis did not detect any toxic substances that could have caused death. It was reported that death occurred as a result of mechanical asphyxia due to food aspiration and subsequent complications.

DISCUSSION AND CONCLUSION

In forensic autopsies, distinguishing between ante-mortem lesions and lesions in the form of artifacts resulting from medical intervention is of great importance in determining the cause and origin of death. The contribution of lesions formed during medical intervention to death and whether there was any error in the intervention in this context constitute a separate issue (7).

The Heimlich maneuver, one of the medical interventions frequently used in upper airway obstructions, was approved by the American Medical Association in 1975 and accepted by the US Surgeon General in 1985 as “the only method that should be used in the treatment of choking due to foreign body airway obstruction.” However, due to the aggressive nature of the maneuver, there are concerns regarding its safety (2,5). Numerous complications associated with the Heimlich maneuver have been described in the literature (5,8-10) (Table 1).

Older adults are particularly vulnerable to the Heimlich maneuver in addition to CPR, due to their susceptibility to weakness and various comorbidities, making them a population group most affected by this maneuver and where complications are frequently observed (2,11). Indeed, advanced age has been reported as an independent risk factor for injuries resulting from such procedures (12). In addition, complications have been reported due to incorrect application, specifically the use of strong infraumbilical thrusts instead of the correct supraumbilical abdominal thrusts (3). Despite all this, the Heimlich maneuver is considered a safe and effective method because it is easy to learn and has a high success rate in saving lives in cases of upper airway obstruction (2,10).

In our case, hemorrhage areas in the soft tissues of the lower lip, upper trachea, and hyoid bone greater horn region were associated with endotracheal intubation. The abrasion on the lower part of the sternum on the anterior chest, hemorrhage areas in subcutaneous soft tissues and over the pericardium, fractures associated with hemorrhage in the sternum and ribs on both sides, minimal hemothorax in the pleural cavities on both sides, subcapsular hemorrhage and laceration in the capsule of the left lobe of the liver can be considered as artifacts likely to have been caused by CPR. Artifacts such as sternum, rib fractures, hemothorax, and liver injury after CPR are well documented and defined in the forensic medical literature (7,13). In addition, it should

be emphasized that artifacts such as sternum, rib fracture, and liver injury are among the complications that may occur due to the Heimlich maneuver. When examining the characteristics of the mesenteric injury associated with the

Heimlich maneuver in our case, it should be noted that, unlike other high-energy traumatic injuries, the hemorrhage area is limited and the laceration is partial and superficial.

Table 1. Complications associated with the Heimlich Maneuver (2-5,9,10)

Heimlich Maneuver Complications	
Post-obstructive pulmonary edema; diffuse patchy lobular airspace disease	Internal carotid artery dissection
Emphysematous bulla in the apical region of the lung	Thrombosis and occlusion in aorta - Acute occlusion due to thrombosis - Complete infrarenal/distal aortic occlusion - Infrarenal aorta with mural thrombus - Thrombosed abdominal aortic aneurysm and common iliac artery aneurysm
Pneumomediastinum - Pneumothorax	
Isolated sternum fracture	
Rib fractures	
Myocardial injury - Acute cardiac tamponade	
Diaphragmatic rupture - Hiatal hernia	Acute aortic valve regurgitation
Esophageal perforation - Hydropneumothorax	Aorta stent displacement - Proximal type I endoleak
Gastric rupture	Dissection and rupture/tear of aortic wall - Dissection and rupture of the abdominal aorta - Tear of the aortic root
Mesenteroaxial gastric volvulus	
Pancreatic transection	
Laceration of liver - Hemoperitoneum	Aortic valve cusp rupture
Mesenteric laceration	Acute compression deformity of the vertebrae - L1/L2 levels
Jejunum perforation - Pneumoperitoneum	
Laceration of spleen - Hemoperitoneum	Rotator cuff tear

Although our case does not involve weakness or similar conditions, it can be said that our patient belongs to the vulnerable group that is more frequently affected by Heimlich maneuver complications, as they can be considered part of the early elderly group based on their age. In psychiatric disorders resembling atypical psychosis, aspiration-related deaths pose a significant risk for various reasons, and additional complicating factors—such as physical frailty and difficulties with communication and cooperation—may be present when performing the maneuver in these cases (14,15). Based on this, it can be concluded that this situation may increase the need for intervention and potential complications in these cases. In the specific case of our patient, although there are no signs of weakness or other conditions that would suggest physical frailty, given the current diagnosis, the patient may be considered at risk for potential complications that could develop indirectly due to the presence of other

contributing factors. Although complications related to the Heimlich maneuver can also occur as a result of their application by healthcare professionals, the literature reports that complications occur more frequently when the maneuver is performed by non-professionals (10). Since the person who performed the maneuver in our case was a professional nursing home nurse, this situation can be considered a protective factor against the occurrence of complications. However, there is insufficient information regarding the method and manner in which the maneuver was performed. It should also be noted that there are no antemortem or postmortem CT findings, and that there are various gaps in the medical records and medical history regarding medications used, the patient's medical history related to the current diagnosis, etc., and that this situation could significantly affect the assessment of complications associated with the Heimlich maneuver.

The Heimlich maneuver is accepted as an effective standard method for acute upper airway obstructions. However, during its application, many complications, including mesenteric injury, may occur as artifacts. At this point, in forensic autopsy cases where the Heimlich maneuver was applied, the forensic medicine specialist should consider all possible complications, make the correct differential diagnosis regarding artifacts, and accurately assess whether these lesions played a role in death. This approach will ensure the accurate determination of the cause and origin of death, particularly in distinguishing between complications resulting from medical procedures and traumatic injuries sustained prior to death. In addition, it can help prevent many other medico-legal issues, such as distinguishing between properly performed procedures and medical malpractice.

Declarations

This study was conducted with the approval of the Scientific Research Commission of the Council of Forensic Medicine (Date: 10.02.2026, Decision No: 21589509/2026/115) and was carried out in accordance with the principles of the Declaration of Helsinki. All or any part of the information in this article has not previously been published on any platform (conference, symposium, media article, etc.) nor has it been submitted to any other academic journal, etc. for evaluation.

Conflict of Interest

The authors declare that they have no conflict of interests regarding content of this article..

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REFERENCES

1. Koop CE. The Heimlich Maneuver. Public Health Rep 1985;100(6):557. PMID: 3934695; PMCID: PMC1425324.
2. Ebrahimi M, Mirhaghi A. Heimlich maneuver complications: A systematic review. Eurasian J Emerg Med 2019;18(3):157-65. doi: 10.4274/eajem.galenos.2019.21033
3. Desai SC, Chute DJ, Desai BC, Koloski ER. Traumatic dissection and rupture of the abdominal aorta as a complication of the Heimlich maneuver. J Vasc Surg 2008;48(5):1325-7. doi: 10.1016/j.jvs.2008.05.061. PMID: 18971040.
4. Ülger H. Complications of the Heimlich maneuver: isolated sternum fracture. Journal of Emergency Medicine Case Reports 2016;7(1):15-16. doi: 10.5152/jaemcr.2015.999
5. Cecchetto G, Viel G, Cecchetto A, Kusstatscher S, Montisci M. Fatal splenic rupture following Heimlich maneuver: case report and literature review. Am J Forensic Med Pathol 2011;32(2):169-71. doi: 10.1097/PAF.0b013e318219c878. PMID: 21512385.
6. Cleveland Clinic. Heimlich Maneuver. Available at: <https://my.clevelandclinic.org/health/treatments/21675-heimlich-maneuver> [cited: 25 November 2025].
7. Şam B, Saka E, Süner Ç. Resuscitation artefacts in forensic autopsies. Bull Leg Med 2003;8(1):5-8. doi: 10.17986/blm.200381487.
8. Sanuki T, Sugioka S, Son H, Kishimoto N, Kotani J. Comparison of two methods for abdominal thrust: a manikin study. Resuscitation 2009;80:499-500. doi: 10.1016/j.resuscitation.2008.12.011.
9. Truong T, Salire K, De Cicco I, Cherian S, Aisenberg G. Incarcerated diaphragmatic hernia following Heimlich maneuver. Proc (Bayl Univ Med Cent) 2017;4:31(1):48-50. doi: 10.1080/08998280.2017.1391034. PMID: 29686551. PMCID: PMC5903536.
10. Wang C, Wang ZZ, Wang TB. Blunt myocardial injury and gastrointestinal hemorrhage following Heimlich maneuver: A case report and literature review. World J Emerg Med 2022;13(3):248-250. doi: 10.5847/wjem.j.1920-8642.2022.038. PMID: 3564206; PMCID: PMC9108913.
11. Chillag S, Krieg J, Bhargava R. The Heimlich maneuver: breaking down the complications. South Med J 2010;103(2):147-50. doi: 10.1097/SMJ.0b013e3181c99140. PMID: 20065901.
12. Moriguchi S, Hamanaka K, Nakamura M, Takaso M, Baba M, Hitosugi M. Aging is only significant factor causing CPR-induced injuries and serious injuries. Leg Med (Tokyo) 2021;48:101828. doi: 10.1016/j.legalmed.2020.101828.
13. Kaldırım U, Toygar M, Karbeyaz, K, Arzıman I, Tuncer SK, Eyi YE, Eroğlu M. Complications of cardiopulmonary resuscitation in non-traumatic cases and factors affecting complications. Egypt J Forensic Sci 2016;6(3), 270-274. doi: 10.1016/j.ejfs.2015.07.005.
14. Herzig SJ, LaSalvia MT, Naidus E, Rothberg MB, Zhou W, Gurwitz JH, Marcantonio ER. Antipsychotics and the risk of aspiration pneumonia in individuals hospitalized for nonpsychiatric conditions: a cohort study. J Am Geriatr Soc 2017;65(12):2580-2586. doi: 10.1111/jgs.15066. PMID: 29095482.
15. Ruschena D, Mullen PE, Palmer S, Burgess P, Corder SM, Drummer OH, Wallace C, Barry-Walsh J. Choking deaths: the role of antipsychotic medication. Br J Psychiatry 2003;183:446-50. doi: 10.1192/bjp.183.5.446. PMID: 14594921. medication. Br J Psychiatry 2003;183:446-50. doi: 10.1192/bjp.183.5.446. PMID: 14594921.