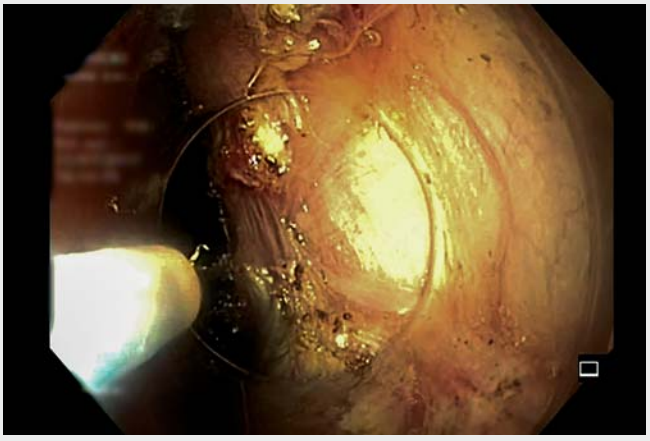
Cardiac arrest as a fatal periprocedural complication of peroral endoscopic myotomy (POEM)

A 66-year-old female with an unremarkable medical history and presenting with a 2-year history of dysphagia, regurgitation, and weight loss was diagnosed with achalasia. Peroral endoscopic myotomy (POEM) was decided upon. Results of the standard pre-anaesthesia evaluation proved unremarkable. Low-flow carbon dioxide was used throughout the procedure. Anterior mucosotomy was performed and a submucosal tunnel created. Percutaneous abdominal needle decompression resulted in normalisation of maximum airway pressure. After the first 3 cm of myotomy had been performed, endoscopically visible movement of the pericardium suddenly stopped (▶ **Video 1**). The knife had not come in contact with, or within the close vicinity of, the pericardium. Although electrocardiographic monitoring showed continuous but slow electrical activity, the central and peripheral pulses were not present. Cardiopulmonary resuscitation was immediately initiated. Bedside examination ruled out the presence of pneumothorax, tamponade, or pulmonary embolism. Despite advanced cardiac life support, the resuscitation was unsuccessful.

Autopsy revealed no signs of pneumothorax, pneumopericardium, tamponade, or mechanical damage to the pericardium or any signs of bleeding or damage to the surrounding tissues or organs. Anatomical changes consistent with three-vessel coronary artery disease and chronic obstructive pulmonary disease were found.

POEM has been shown to be a safe procedure. In a systematic review of its efficacy and safety, out of 1299 procedures, no deaths were reported [1, 2]. Banks-Venegoni et al. reported on a patient with cardiac arrest during POEM caused by capnopericardium from a defect created during myotomy; in this case resuscitation was successful [3]. Resuscitation was also successful in a case of pulseless electrical activity due to pneumopericardium and pneumomediastinum in a patient in whom air was inadvertently used instead of carbon dioxide [4].

To our knowledge, this is the first report of a fatal cardiac arrest during POEM. However, its exact cause remains unknown. Possible explanations include reflex bradycardia or restrictive capnomediastinum, resulting in pulseless electrical activity refractory to resuscitation in a patient with advanced coronary atherosclerosis and pulmonary disease.



Video 1 Cardiac arrest with pulseless electrical activity during anterior peroral endoscopic myotomy.

Endoscopy_UCTN_Code_CPL_1AH_2AK

Competing interests

The authors declare that they have no conflict of interest.

The authors

Tomas Hucl[1], Eva Uchytilova[2], Jana Markvartova[3], Petr Tomasek[3], Eva Kieslichova[2], Julius Spicak[1], Jan Martinek[1]

1 Department of Gastroenterology and Hepatology, Institute for Clinical and Experimental Medicine, Prague, Czech Republic
2 Department of Anesthesiology, Institute for Clinical and Experimental Medicine, Prague, Czech Republic
3 Department of Forensic Medicine, Second Faculty of Medicine, Charles University, Prague, Czech Republic

Corresponding author

Tomas Hucl, MD, PhD
Department of Gastroenterology and Hepatology, Institute for Clinical and Experimental Medicine, Videnska 9, 14021, Prague 4, Czech Republic
tomas.hucl@ikem.cz

References

[1] Martinek J, Svecova H, Vackova Z et al. Per-oral endoscopic myotomy (POEM): mid-term efficacy and safety. Surg Endosc 2017; 32: 1293–1302
[2] Crespin OM, Liu LW, Parmar A et al. Safety and efficacy of POEM for treatment of achalasia: a systematic review of the literature. Surg Endosc 2017; 31: 2187–2201
[3] Banks-Venegoni AL, Desilets DJ, Romanelli JR et al. Tension capnopericardium and cardiac arrest as an unexpected adverse event of peroral endoscopic myotomy (with video). Gastrointest Endosc 2015; 82: 1137–1139
[4] Maher SZ, Chintanaboina J, Eun Kim D et al. Pneumopericardium complicating per-oral endoscopic myotomy due to inadvertent use of air instead of carbon dioxide. ACG Case Rep J 2018; 5: e59

Bibliography

Endoscopy 2020; 52: E411–E412
DOI 10.1055/a-1149-1055
ISSN 0013-726X
published online 24.4.2020

Georg Thieme Verlag KG, Rüdigerstraße 14, 70469 Stuttgart, Germany