Incarcerated diaphragmatic hernia following Heimlich maneuver

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ABSTRACT

The Heimlich maneuver or abdominal thrust is a recognized effective therapy for foreign-body airway obstruction. Serious complications, however, have been described. We present a case of an incarcerated diaphragmatic hernia secondary to Heimlich maneuver.

KEYWORDS Diaphragmatic hernia; Heimlich maneuver

When the Heimlich maneuver (HM), or abdominal thrust, was introduced in 1975, it provided a simple yet effective therapeutic approach to resolving foreign-body airway obstruction, the cause of almost 4000 choking-related deaths annually in the United States.¹ Described herein is a patient with an incarcerated diaphragmatic hernia appearing as a complication of HM.

CASE REPORT

An 85-year old woman was in the hospital recovering from knee arthroplasty. While eating, she began to choke on her food. The event was noticed by a nurse who immediately performed HM. The episode resolved. The next day, the patient complained of dyspnea and dysphagia. A chest radiograph (*Figures 1a, 1b*) revealed a new large incarcerated hiatal hernia occupying the right side of the chest cavity. An exploratory laparotomy the next day led to reduction of the stomach with gastropexy to the crus of the diaphragm. A chest radiograph (*Figure 1c*) and contrasted gastric radiography (*Figure 2*) after the procedure verified resolution of the hernia. However, the patient's condition further deteriorated with septic shock and severe malnutrition requiring total parenteral nutrition, and she stayed in the hospital for 50 days before being discharged to a long-term acute facility, where 2 months later she is still slowly recovering.

DISCUSSION

HM is one of the most widely recognized rescue procedures expected to be performed by bystanders with little to no

medical training. The increased abdominal or thoracic pressure applied during HM may lead to multiple complications, as summarized in Table 1.^{2–18} Ours is the second reported case of a diaphragmatic hernia resulting from HM.¹⁹

This patient's hospital course was complicated by multiple surgeries, intubations, and overall functional decline. A case series of HM complications showed similarly poor outcomes: 13 of 41 patients with such complications died and 17 others required surgery to repair different viscera.²⁰ Though HM is a life-saving procedure, we believe it would be wise to not only exercise caution when performing abdominal thrusts on the elderly and ensuring that it is indeed indicated, but also closely monitoring the individuals for dysphagia, odynophagia, respiratory distress, or shock after the maneuver.

The Australian Resuscitation Council does not recommend abdominal thrusts at all due to the potential severity of the complications and instead advocates the use of back blows followed by up to five anterior chest thrusts. Anterior chest thrusts are similar to chest compressions but with greater impulse. Another proposed technique is the lateral chest thrust, performed with patients lying on their side. These maneuvers have been infrequently compared through animal and cadaver studies, with mixed results.^{21,22} Given the public familiarity with HM, it is important to bear in mind potential complications that could ensue in the following minutes to days, as the timely diagnosis of these complications could lead to life-saving treatment.²⁰

Figure 1. (a) Large hiatal hernia occupying most of the lower right chest cavity. (b) Baseline chest film, where the diaphragmatic hernia cannot be appreciated. (c) Postoperative chest film, with resolution of the diaphragmatic hernia.

Figure 2. Gastric contrasted film where the stomach is seen fully under the diaphragm; no contrast leak is identified.

Table 1. Previously reported complications of the Heimlich maneuvers

Complication	Number of reported cases	Patients' age (years)	References
Pneumothorax	3	7, 10, 3	2–4
Abdominal aortic thrombosis	3	81, 70, 62	5–7
Gastric rupture	2	57, 76	8, 9
Pancreatic rupture	2	11, 3	10, 11
Esophageal rupture	1	26	12
Abdominal aortic dissection	1	78	13
Aortic valve cusp rupture	1	86	14
Internal carotid artery dissection	1	Undisclosed	15
Hepatic rupture	1	88	16
Splenic rupture	1	83	17
Jejunum rupture	1	22	18

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