



H5 Fatality Following Percutaneous Endoscopic Gastrostomy Tube Insertion

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After attending this presentation, attendees will better understand vascular injury and a fatal hemorrhage as a rare complication of Percutaneous Endoscopic Gastrostomy (PEG) tube insertion. The associated autopsy findings, risk factors for vascular injury and hemorrhage, and the use of therapeutic complication as a manner of death will also be discussed.

This presentation will impact the forensic science community by alerting the forensic pathologist of this complication of percutaneous endoscopic gastrostomy tube insertion, which can be demonstrated at the time of autopsy by careful dissection. This presentation will also impact clinicians by recognizing the potential for vascular injury at the time of tube insertion and patients at increased risk of hemorrhage.

PEG tube placement is a minimally invasive method of providing long-term enteral nutritional support.¹ The procedure was first conceptualized and performed in 1979 in Cleveland, OH, by Drs. Ponsky and Gauderer for use in the pediatric population. Their goal was to avoid a traditional laparotomy and instead provide a minimally invasive technique for gastrostomy tube insertion.² Following the initial success of the procedure, an estimated 100,000 to 125,000 PEG tube insertions are now performed every year in the United States.³ Absolute contraindications to PEG tube insertion include pharyngeal or esophageal obstruction, active coagulopathy, and any general contraindication to endoscopy.⁴

A 54-year-old man with metastatic gastric adenocarcinoma was admitted to the hospital for management of dysphagia and a 30lb weight loss. He was initially receiving total parenteral nutrition via a central line. During his admission, he developed an upper extremity deep vein thrombosis for which he was started on heparin treatment. The heparin was stopped the following day after he developed hematemesis. Subsequently, he underwent a PEG tube placement in the interventional radiology department.

Following his transfer back to the intensive care unit, he was noted to be hypotensive and tachycardic. A massive transfusion protocol was initiated and an attempted coil embolization of the presumed vascular injury was initiated; however, the patient died during the procedure.

At autopsy, the torso was remarkable for diffuse petechiae and ecchymoses. A gastrostomy tube was extending from the epigastrium. There were seven liters of blood in the peritoneal cavity. The gastrostomy tube had perforated the greater omentum immediately adjacent to the transverse colon, with hemorrhage along the serosal surface, but no defect in the colonic wall was identified. The tube then perforated the pylorus of the stomach, but also inadvertently transected the right gastroepiploic artery. The gastric wall was diffusely thickened, up to 1cm. Also of note was advanced hepatic cirrhosis.

Serious or fatal complications following PEG tube insertion are rare. Approximately half of all patients will experience a minor complication, most frequently a wound infection.⁵ Mortality rates are reported to be approximately 2% and have resulted from esophageal perforation, peritonitis, and severe respiratory distress.⁶ Fatal hemorrhage is very rare with only two prior reported cases.^{6,7} In both of these cases, the patient had undergone a prior cholecystectomy resulting in intra-abdominal adhesions, resulting in distorted anatomy. In this particular case, the recent use of heparin as well as the underlying advanced hepatic cirrhosis may have contributed to the profuse hemorrhage. The cause of death was hemorrhagic complications of PEG tube for the treatment of metastatic gastric adenocarcinoma. The manner of death was therapeutic complication. The therapeutic complication manner is used in a few jurisdictions in the United States and is defined as fatalities due to predictable complications of appropriate medical therapy.⁸

Although a rare complication, clinicians should be aware of the possibility of a vascular injury during PEG tube insertion and underlying natural diseases (such as hepatic cirrhosis) or concurrent medical therapy that may confer an additional risk of bleeding. Careful dissection at the time of autopsy with the gastrostomy tube *in situ* will help identify the underlying fatal injury.

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Gastrostomy Tube, Hemorrhage, Therapeutic Complication