Cardiac tamponade: an unusual, lifethreatening complication after transhiatal resection of the esophagus

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Abstract

Transhiatal resection for carcinoma of the distal esophagus is associated with relative high morbidity and mortality. We present a rare case of cardiac tamponade after transhiatal esophagectomy for which emergency sternotomy was performed. Probably the retraction of the heart during exploration of the mediastinum caused a laceration of an epicardial vein. Although very rare, cardiac tamponade should be considered when hemodynamic instability during or after transhiatal esophagectomy occurs.

Keywords: Transhiatal esophagectomy; Complication; Cardiac tamponade

1. Introduction

Surgical treatment for esophageal carcinoma is associated with a high incidence of peri-operative complications, resulting in relatively high morbidity and mortality rates in the early postoperative period [1]. Controversy remains whether a transhiatal or a radical transthoracic approach is the most appropriate with respect to perioperative morbidity, mortality and survival [2–5]. In our hospital, a transhiatal resection with local lymphadenectomy around the distal esophagus is carried out as a routine procedure for distal carcinomas of the esophagus. In this case we report a rare complication associated with this procedure.

2. Case report

A 50-year-old male with a history of a cystectomy for bladder carcinoma, alcohol abuse and gastroesophageal reflux disease, was diagnosed with an adenocarcinoma of the distal esophagus. Preoperative staging did not reveal distant metastases and endosonographic evaluation showed a T2N0M0 tumor. A transhiatal esophagectomy was performed according to Orringer et al. [6] with an additional local lymphadenectomy. During the abdominal phase, the left lobe of the liver was mobilized, the left gastric artery ligated, subsequently the hiatus enlarged and retractors were placed in the hiatus in order to perform a local lymphadenectomy around the distal esophagus below the subcarinal lymph nodes. More proximally, the mediastinal dissection was performed in a blunt fashion, with a hand inserted in the diaphragmatic hiatus posteriorly. After dissection and transsection of the cervical esophagus by a left cervical approach, the esophagus was moved downwards by a venous stripper. Sparing the gastroepiploic artery, a gastric conduit was created using a linear stapler. A left cervical esophagogastrectomy was performed. The hiatus was closed with resorbable sutures. Apart from an arterial bleeding of the left gastric artery the operative procedure was uneventful. The early postoperative course in the ICU was without any adverse event and the patient remained hemodynamically stable.

However, a few hours after the operation, the patient developed signs of bleeding with a drop in systolic pressure and hemoglobin level and a relaparotomy was performed. Initially only a small bleeding focus at the ventral side of the pancreas was identified and ligated. Since this finding did not explain the previously noted hemodynamic instability and blood loss was observed from the posterior mediastinum, the hiatus was re-opened and retractors were placed for adequate inspection. While exploring the posterior mediastinum through the enlarged hiatus, a sudden decline in systolic pressure with an increase in central venous pressure was noted. Cardiac tamponade was considered and the pericardium was opened. A large blood clot was removed from the pericardial sac and systolic pressure and central venous pressure recovered immediately. As blood loss continued from within the pericardium, a sternotomy was performed. A laceration of a small cardiac vein near the ramus descendens posterior appeared to be the source of the persistent blood loss. The bleeding was controlled with a single non-absorbable 4-0 suture. No further signs of persistent bleeding were observed. In spite of this, the patient remained hemodynamically unstable, dependent on inotropic support, with a deterioration...
at day four. No signs of esophagus graft ischemia or leakage of the anastomosis were observed on gastroscopy. No signs of recurrent cardiac tamponade were noted. Again, relaparotomy was performed, but no explanation for the patient’s unstable condition was found. Despite maximal inotropic support the patient died on the fourth postoperative day. Unfortunately, permission for autopsy was not obtained.

3. Discussion

Surgical resection of esophageal carcinoma either by the combined transthoracic and transabdominal approach, or by transthiatal resection carries a high risk of morbidity and mortality [1]. This is due to many factors like the natural history of the disease, patients poor nutrition state, associated diseases and probably, most importantly, the magnitude of the operative procedure with complications like anastomotic leakage, respiratory failure and sepsis [1].

There has been debate about the optimal type of resection for esophageal cancer. A meta-analysis showed no significant differences between transthoracic and transhiatal resection regarding early morbidity, hospital-mortality rates, and three- and five-year survival [2].

Perioperative cardiac complications of an esophagectomy like arrhythmia, low cardiac output syndrome, myocardial infarction and congestive heart failure may be caused by manipulation of the heart and diaphragm during the procedure [8]. Cardiac tamponade following esophagectomy is a very rare complication. Kitamura et al. [8] described a single case of cardiac tamponade in 277 patients after esophagectomy. Two additional case reports about this potentially life-threatening complication after esophagectomy have been published [9,10]. In all these cases, cardiac tamponade was found after a thoraco-abdominal esophagectomy. To our knowledge, cardiac tamponade after a transhiatal approach has not yet been reported in the literature.

In the presented patient, a cardiac tamponade was diagnosed during relaparotomy for hemodynamic instability. The most likely cause of the cardiac tamponade in this case was retraction of the heart during the initial operation which was needed for an adequate lymphadenectomy. Alternatively, this complication might have been caused by exploration of the mediastinum through the diaphragmatic hiatus posterior during relaparotomy. As in our patient, transthiatal drainage of the pericardium will immediately restore normal hemodynamics. When bleeding from the pericardial sac continues, a sternotomy should be performed to reveal the cause of the persisting blood loss. In the presented patient a laceration of an epicardial vein was found. The reason for the deterioration and hemodynamic instability at day four and cause of death remains unclear in this patient, but on clinical grounds, development of multiple organ failure was most likely the cause of these unfortunate sequelae.

In conclusion, although this potential life-threatening complication is very rare, cardiac tamponade should be considered as a cause of hemodynamic deterioration during or after esophagectomy. To prevent this complication, retractors in the hiatus to visualize structures in the mediastinum posterior should be used with caution in order not to damage structures in the heart.

References