

Delayed repair of esophageal perforation due to transoesophageal echocardiography

Correzione tardiva di una perforazione esofagea dopo eco transesofageo

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ABSTRACT: *Delayed repair of esophageal perforation due to transoesophageal echocardiography. S. Omorphos, C. Kotoulas, J.J. Homer, K.E. McLaughlin.*

Since its introduction into clinical practice in the 1980s, transoesophageal echocardiography has become an invaluable tool in cardiac surgery having only a few cases of serious complications reported in the literature. We report a

novel case of delayed surgical repair of esophageal perforation due to transoesophageal echocardiography in cardiac surgery and reviewed the anecdotal literature.

Keywords: rupture (esophageal), esophagus, echocardiography (transoesophageal), CABG surgery.

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Introduction

Transoesophageal echocardiography (TEE) is traditionally considered as a safe procedure and is being widely used in cardiac surgery for monitoring and diagnostic purposes [1, 2]. However reports of serious gastrointestinal complications relating to TEE use are accumulating in the literature [3]. We report a novel case of delayed diagnosis of esophageal perforation due to TEE followed by delayed but successful repair

Case Report

A 66 year old female patient was admitted to our department for coronary artery bypass surgery. Her past medical history included chronic obstructive pulmonary disease. Following induction of anaesthesia, a TEE probe (Multiplane 5MHz adult probe, General Electric Vivid 7®) was inserted into the esophagus with no difficulty and was left in a neutral position during bypass. No nasogastric tube was placed following the operation. The patient tolerated the procedure well and initial postoperative phase was satisfactory.

On day 5 the patient complained of slight swallowing difficulties, but the chest x-ray was normal. By day 8 she developed dyspnea and chest pain. Chest radiograph showed right-sided pneumothorax which was initially drained. On day 13, empyema was suspected; therefore video-assisted thoracoscopic surgery was performed for pleural lavage. The consistency of the material removed from the

chest raised the possibility of an esophageal tear. Two chest drains were inserted for the appropriate drainage of the cavity. A gastrograffin contrast-swallow (GCS) showed a contrast leak from the distal third esophagus to the right pleural cavity. No endoscopy was performed. A right exploratory posterolateral thoracotomy was performed, and although the esophagus was mobilized, no esophageal tear was evident. A repeat GCS showed a small contained leak in the mid third esophagus 3-4 cm below the level of the carina. As the patient remained haemodynamically stable throughout, she was treated conservatively with nasogastric feeding, antibiotics and chest drainage. A further GCS demonstrated a large leak in the cervical esophagus with most of the contrast passing into the mediastinum. On day 35, endoscopy and left cervical exploration revealed a 2cm defect in the cervical esophagus which was repaired using a pedicled sternocleidomastoid muscle flap. Five days later, she developed a leak from the neck drain site. On day 46, a GCS demonstrated a persistent leak in the posterior aspect of the cervical esophagus driving to a blind cavity lying behind the esophagus into the posterior mediastinum. On day 56, neck re-exploration and esophageal repair with a pedicled pectoralis major muscle island flap was performed. On day 68, a further GCS demonstrated a free flow of contrast down the esophagus without any evidence of leakage. The patient was started gradually on oral feeding and made very good progress. There were no further symptoms and the patient remained well at review 18 months later.

Discussion

Since its introduction into clinical practice in the 1980s, TEE has become an invaluable tool in cardiac surgery providing crucial information in the management of perioperative cardiac events [1, 2]. The procedure has been shown to be safe as the incidence of major gastrointestinal complications, such as mucosal laceration, haemorrhage from esophageal contusion and esophageal perforation, ranged from 0.01-0.04% in early studies [1, 2] to 1.2% in recent studies [3]. The fact that late presentations were not accounted for in early studies may explain this difference. The mortality rate is less than 0.01% [1, 2, 3].

There have been sixteen cases of esophageal perforation and a case of esophago-tracheal perforation reported [3]. Most lesions occurred in the hypopharynx or proximal oesophagus [4]. These tend to be traumatic in nature as they usually occur during insertion and manipulation of the probe in the anaesthetized patient. Furthermore, Urbanowicz et al speculated that esophageal injuries due to TEE may arise as a result of mucosal ischaemia, while Kharasch et al raised the possibility of thermal injury [5, 6].

The location of the injury and the interval between perforation and diagnosis determine the clinical features of esophageal perforation. The features of Meckler's triad of vomiting, pain and subcutaneous emphysema are often absent [7]. High index of suspicion is required for diagnosis as presentation tends to be inconclusive mimicking other chest or abdominal disorders. We suspected the perforation of esophagus on day 13 following VATS washout. A number of factors led to the delayed diagnosis; the low index of clinical suspicion coupled with the radiological evidence of pneumothorax masked the underlying esophageal perforation, as she had past history of chronic obstructive pulmonary disease. Furthermore, the GCS was not diagnostic for the precise location of the esophageal tear and led to the wrong surgical approach, while no endoscopy was performed initially. Despite delayed diagnosis, we achieved a successful outcome because of continuous drainage of the pleural cavity, antibiotic management and maintenance of adequate nutritional support. Furthermore, the delayed repeated repair using pedicled muscular flaps was possible because of the stable general condition of the patient. Traditionally, early surgical repair of similar cases is considered to have a better outcome and mortality is

significantly reduced compared to delayed surgical repair. Recently, however, a number of studies have shown little difference in the overall mortality between early and late surgical intervention [8].

In conclusion, a high index of suspicion for perforation of the esophagus should be maintained for any patient presenting with swallowing difficulties and late pneumothorax following TEE use. With adequate drainage and good nutritional support, repair is possible even in delayed cases.

Riassunto

Sin dalla sua introduzione nella pratica clinica negli anni '80, l'Eco transesofageo si è dimostrato un importante strumento di valutazione in cardiocirurgia, con solo pochi casi di complicazioni riportate in letteratura. Qui riportiamo un caso originale di riparazione tardiva di una perforazione esofagea dopo eco transesofageo utilizzato durante cardiocirurgia.

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