

TECHNICAL NOTE

Surgical management of a life-threatening retro-pharyngeal haematoma following trans-oesophageal echocardiography

Trattamento chirurgico di un pericoloso ematoma retrofaringeo, sviluppatosi a seguito di un'ecocardiografia transesofagea

F. OTTAVIANI, A. SCHINDLER, F. MOZZANICA, A. PERI, S. REZZONICO, M. TURIEL¹Department of Clinical Sciences "L. Sacco", Milan, Italy; ¹ Cardiology Unit, IRCCS Istituto Ortopedico "Galeazzi", University of Milan, Milan, Italy

SUMMARY

Trans-oesophageal echocardiography is generally considered a safe procedure, but occasional life-threatening complications have been reported. The aim of this clinical investigation is to outline the need of surgical management in cases of large retro-pharyngeal haematoma following trans-oesophageal echocardiography. In the case reported here, a patient with cervical spondylosis on anti-coagulant therapy was referred to the Head and Neck Department because of a retro-pharyngeal haematoma with severe upper airway obstruction following trans-oesophageal echocardiography. Tracheotomy was required to guarantee respiratory function, while trans-cervical surgery was performed to evacuate the haematoma. Total recovery was achieved within 10 days. In conclusion, the head and neck surgeon should consider the need of surgical management in cases of retro-pharyngeal haematoma following trans-oesophageal echocardiography.

KEY WORDS: Trans-oesophageal echocardiography • Haematoma • Thrombosis • Dyspnoea

RIASSUNTO

Nonostante siano state descritte complicanze potenzialmente letali, l'ecocardiografia transesofagea viene considerata una procedura diagnostica sicura. Scopo del presente lavoro è sottolineare come, nei casi di voluminosi ematomi secondari a tale procedura, possa diventare indispensabile il ricorso alla chirurgia per tutelare la vita del paziente. Nel caso qui descritto, un paziente affetto da spondilosi cervicale e in terapia anticoagulante ha sviluppato, a seguito di un'ecocardiografia transesofagea, un ematoma retrofaringeo tanto voluminoso da determinare un'ostruzione delle vie aeree superiori. Per assicurarne la pervietà è stato necessario ricorrere a una tracheotomia, l'ematoma, invece, è stato drenato per via transcervicale. Il paziente è guarito completamente in 10 giorni. Il chirurgo otorinolaringoiatrico dovrebbe essere a conoscenza, non solo di questa rara complicanza, ma anche della necessità di un suo trattamento chirurgico.

PAROLE CHIAVE: Ecocardiografia transesofagea • Ematoma • Trombosi • Dispnea

Acta Otorhinolaryngol Ital 2011;31:39-42

Introduction

Trans-oesophageal echocardiography (TEE) is a diagnostic imaging technique for cardiac structures combining cardiac ultrasound (US) technology and endoscopy. To obtain a cardiac image, the trans-oesophageal probe has to be positioned correctly within the oesophagus, providing views of cardiac structures that are not adequately provided by trans-thoracic echocardiography. Although a semi-invasive procedure, TEE is generally considered a safe diagnostic tool¹. Contraindications for a TEE examination are the presence of oesophageal diverticulum, varices, tumours or stenoses; furthermore, TEE is contraindicated in patients who have received therapeutic thoracic radiations².

Several studies have reported TEE-related morbidity ranging from 0.18% to 2.8% with a 0.22% incidence

of severe complications such as haematemesis, laryngospasm and hypo-pharyngeal tear¹⁻⁸. Chan et al.⁹ identified TEE complications in 7 out of 1500 adult patients (0.47%). In order to prevent pharyngeal complications, the idea of directly visualizing the pharynx with an optical probe was suggested. Aviv et al.⁸ reported hypo-pharyngeal lacerations or haematomas in 19/80 (23.8%) patients undergoing traditional TEE compared to an optical technique, in which complications were present in only 1/79 patients (1.3%). Oesophageal intubation was not achieved in 11 of these patients (0.73%) due to lack of experience of the operator, a hypersensitive pharynx, and cervical spondylosis. According to the literature, only a few hypo-pharyngeal injuries resulting from TEE require surgery, while management is usually carried out with

medical or conservative measures³. A case of TEE resulting in upper airway obstruction, requiring surgical intervention, is described.

Case report

A 77-year-old female with a history of chronic atrial fibrillation and short-term onset of transient ischaemic attacks was sent to our institution for TEE to exclude the risk of further embolization. She was a non-smoker, not overweight and had no vascular risk factors such as arterial hypertension, clotting deficiency, or abnormal cholesterol levels. Upon physical examination, she presented no hemiparesis, weakness of an upper limb, vertigo or aphasia; heart rate was 72 bpm and blood pressure 120/80 mmHg, being equal in both arms. Examination of the heart revealed a 2/6 systolic murmur at the apex. Electrocardiography showed atrial fibrillation and a left bundle branch block. The patient presented some limitation in neck movement; none of the high-risk conditions, such as presence of oesophageal diverticulum, varices or tumour, were referred. The anticoagulant therapy was interrupted by the patient herself about one month before the examination. TEE was performed with a commercially available US system (Sonos 5500, Philips Medical System, Andover, MA, USA) equipped with a 5-MHz multiplane transducer. A mild intravenous sedation with midazolam 15 mg, and a local lidocaine spray anaesthesia were administered to the patient. Difficult progression of the instrument (four attempts) required anaesthesiologic support and resulted in a minimal oral bleeding. TEE revealed a mild mitral regurgitation, a thrombus with a diameter of about 1.0×0.8 cm at the bottom of the left atrial appendage. Twenty four hours after the procedure, the anticoagulant therapy was started with 5,000 U of subcutaneous low-molecular-weight heparin. Two days after TEE, the patient complained of hoarseness, sore throat and mild dysphagia. Five days thereafter a progressive severe dysphagia and dyspnoea appeared; a neck and thorax computed tomography scan (CT) showed a retropharyngeal right haematoma (cm 7×3) with a pharyngeal and laryngeal mass effect (Fig. 1A). Severe cervical spondylosis was also present (Fig. 1B). Trans-nasal upper airways endoscopy showed a hypo-pharyngeal swelling resulting in a severe reduction of the laryngeal respiratory space. The anticoagulant therapy was discontinued and surgery for evacuation of the haematoma under general anaesthesia was planned. Severe cervical spondylosis conditioned the failure of the oro-tracheal intubation attempts, even under endoscopic guidance, and excluded the possibility of performing a traditional tracheotomy because of the lack of neck extension. Under local anaesthesia, a temporary cricothyroidotomy was then performed allowing tracheal intubation. The patient then underwent left cervicotomy in order to evacuate the

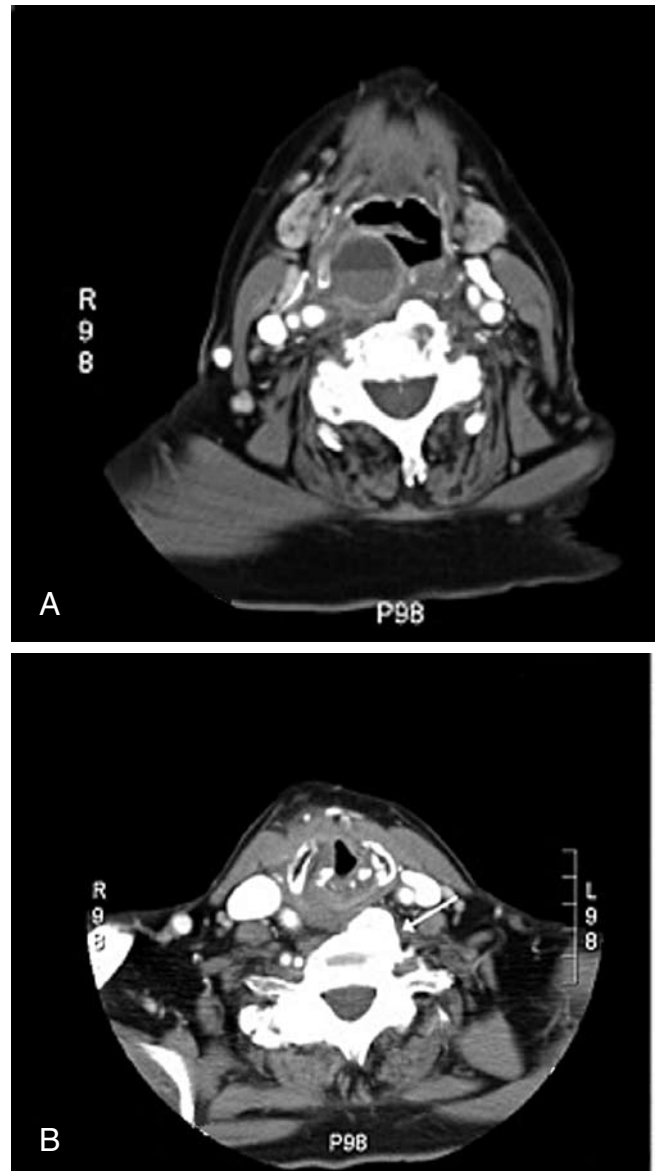


Fig. 1. Computed tomography scan reveals right retro-pharyngeal haematoma (A) and massive cervical spondylosis (white arrow in B).

airway-obstructing retro-pharyngeal haematoma under general anaesthesia. After exposure of the anterior border of the sternocleidomastoideus muscle, the neurovascular bundle of the neck was exposed. The pharyngeal constrictor muscle was incised and the haematoma was evacuated, while preserving the sub-mucosal and mucosal pharyngeal layers; a suction drainage was left *in situ* for 3 days. Clinical symptoms showed a prompt improvement in the immediate post-operative period confirmed by daily endoscopic examinations showing a significant reduction of the posterior wall bulge. Due to the subglottic stenosis risk, the status of cricothyroidostomy was assessed every day with endoscopic examination. Cricothyroidostomy was removed as soon as the patient managed to maintain the tracheostomy tube closed (7 days) and 3 days afterwards the patient was discharged.

Discussion

Retro-pharyngeal haematoma rarely occurs and fewer than 40 cases of traumatic origin have been reported in the last 20 years¹⁰⁻¹⁵. To the best of our knowledge, only two cases of airway obstruction, due to pharyngeal haematoma following TEE, have been reported^{3,4}; however, both cases resolved within 24 hours without surgery. The surgical management of a life-threatening retro-pharyngeal haematoma following TEE in a patient on anti-coagulant therapy with severe cervical spondylosis has been reported here for the first time. Even though TEE is considered a safe procedure, upper airway complications may occur; pharyngeal and oesophageal contraindications need to be carefully taken into consideration, including the risk of retro-pharyngeal haematoma. A review of the literature suggests a variety of precipitating factors for retro-pharyngeal haematoma such as bouts of coughing, sneezing, straining, neck trauma, foreign body ingestion, retropharyngeal infection and internal jugular vein cannulation¹⁰⁻¹⁹; furthermore, retro-pharyngeal haemorrhage may also be spontaneous²⁰. Therefore, in an unclear clinical situation, not only a barium X-ray of the oesophagus, but also fiberoptic nasal-pharyngeal and laryngeal endoscopy, as well as cervical spine radiography should be performed before TEE. In our case, the TEE procedure was complicated by the difficult progression of the instrument, conditioning the formation of a sub-mucosal haematoma; the haematoma was probably triggered by probe injury and became more severe following anticoagulant therapy. In fact, it is not unusual to find retro-pharyngeal haematoma in patients with abnormal platelet function

or clotting factor deficiency¹⁶. Severe cervical spondylosis appeared to be an important factor in determining difficult probe introduction, due to the impossibility to achieve the optimal neck extension for progression of the instrument. Head and neck CT scan was important to understand the role of cervical spondylosis and to differentiate between oedema and haematoma and to study its dimensions and localization. In cases of retro-pharyngeal haematoma, both airways stabilization and haematoma management are required. Endotracheal intubation would generally be sufficient in patients with compromised upper airways; however, in cases of large haematomas like the one described, a tracheostomy would be more appropriate, avoiding the risk of the haematoma rupture with bleeding and increasing oedema. The spontaneous resorption of a large haematoma is possible, but it can take several weeks with the risk of infection or abscess; surgical evacuation seems, therefore, a better solution. The lateral cervical approach was preferred in the reported case, because it prevented retropharyngeal contamination, as other Authors have already suggested². In conclusion, TEE is feasible in most adult patients as an out-patient procedure, but proper patient selection and preparation is crucial to avoid procedure complications. The otolaryngologist may play a significant role in the assessment of a patient considered at risk. In cases of pharyngeal trauma, retro-pharyngeal haematoma may develop; in these cases, careful observation of the evolution is required, since surgery may be necessary both for airway stabilization and haematoma evacuation.

References

- Daniel WG, Erbel R, Kasper W, et al. *Safety of transesophageal echocardiography. A multicentre survey of 10,419 examination.* Circulation 1991;83:817-21.
- Seward JB, Khandheria BK, Oh JK. *Critical appraisal of transesophageal echocardiography: limitations, pitfalls and complications.* J Am Soc Echocardiogr 1992;5:288-305.
- Saphir JR, Cooper JA, Kerbavez RJ, et al. *Upper airway obstruction after transesophageal echocardiography.* J Am Soc Echocardiogr 1997;10:977-88.
- Pandia MP, Bithal PK, Bhagat H, et al. *Airway obstruction after extubation following use of transesophageal echocardiography for posterior fossa surgery in the sitting position.* J Clin Neurosci 2007;14:1139-41.
- Cote G, Denault A. *Transesophageal echocardiography-related complications.* Can J Anaesth 2008;55:622-47.
- Arima H, Sobue K, Tanaka S, et al. *Airway obstruction associated with transesophageal echocardiography in a patient with a giant aortic pseudoaneurysm.* Anesth Analg 2002;95:558-60.
- Eichhorn KW, Bley TA, Ridder GJ. *Unrecognized hypopharyngeal perforation during transesophageal echocardiography with deep neck infection and mediastinitis.* HNO 2003;51:903-7.
- Aviv JE, Di Tullio MR, Homma S, et al. *Hypopharyngeal perforation near-miss during transesophageal echocardiography.* Laryngoscope 2004;114:821-6.
- Chan KL, Cohen GI, Sochowski RA, et al. *Complications of transesophageal echocardiography in ambulatory adult patients: analysis of 1500 consecutive examinations.* J Am Soc Echocardiogr 1991;4:577-82.
- Sandooram D, Chandramohan AR, Radcliffe G. *Retropharyngeal haematoma causing airway obstruction: a multidisciplinary challenge.* J Laryngol Otol 2000;114:706-8.
- Mariani PJ. *Occipital condyle fracture presenting as retropharyngeal hematoma.* Ann Em Med 1990;19:1447-9.
- Ophir D, Bartal N. *Retropharyngeal hematoma following fish-bone ingestion.* Ear Nose Throat J 1990;67:528-30.
- Tenofsky PL, Porter SW, Shaw JW. *Fatal airway compromise due to retropharyngeal hematoma after airbag deployment.* Am Surg 2000;66:692-4.
- Duvillard C, Ballester M, Romanet P. *Traumatic retropharyngeal hematoma: a rare and critical pathology needed for early diagnosis.* Eur Arch Otorhinolaryngol 2005;262:713-5.

- ¹⁵ Stewart RW, Hardjasudarma M, Nall L, et al. *Fatal outcome of jugular vein cannulation*. Southern Med J 1995;88:1159-60.
- ¹⁶ Owens DE, Calcaterra TC, Aarstad RA. *Retropharyngeal haematoma. A complication of therapy with anticoagulants*. Arch Otolaryngol 1975;101:565-8.
- ¹⁷ Jones TM, Owen GO, Morar P. *Spontaneous retropharyngeal haematoma attributable to Ebstein Barr virus infection*. J Laryngol Otol 1996;110:1075-7.
- ¹⁸ Senthuran S, Lim S, Gunning KE. *Life threatening airway obstruction caused by a retropharyngeal haematoma*. Anesthesia 1999;54:674-8.
- ¹⁹ Daniello NJ, Goldstein SI. *Retropharyngeal hematoma secondary to minor blunt head and neck trauma*. Ear Nose Throat J 1994;73:41-3.
- ²⁰ Miller R, Collison P, Gouda HE. *Spontaneous retropharyngeal haemorrhage causing airway obstruction: a case report with a review of the literature*. S D Med 2006;59:295-7.

Received: November 3, 2010 - Accepted: December 30, 2010