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RESEARCH

Transoesophageal echocardiography before DC cardioversion: a survey of clinical practice in the UK

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Abstract

Transoesophageal echocardiography (TOE) can be used to expedite DC cardioversion (DCCV) in the absence of adequate anticoagulation. There are no guidelines for the management of sedation or general anaesthetic. We performed a survey of NHS echocardiography departments to determine UK practice. Responses were received from 95 (50%) of 189 centres, and TOE-guided DCCV was performed in 81 centres. The numbers were <10 a year in 41 (50%), 10–50 in 31 (38%), 50–100 in 8 (10%) and >100 in 4 (5%) centres. Sedation for TOE was a usual practice in 67 (80%) centres but often temporally disconnected from DCCV due to logistical reasons. TOE under general anaesthetic was performed in 35 (43%) centres and as the usual method in 16 (20%). The patient was in the supine position with endotracheal intubation in 20 (57%) of centres, but without any form of airway protection while supine in 5 (14%). There is variability in practice across centres in the UK, in part due to limitations to services in most centres but also because of an absence of UK guidelines. The development of national standards may address this and aid in the development of local business cases to extend services.

Key Words
- transoesophageal echo
- DC cardioversion
- sedation
- anaesthesia

Background

Electrical cardioversion to restore sinus rhythm in patients with atrial fibrillation (1) is usually preceded by anticoagulation for at least 3 weeks. However, transoesophageal echocardiography (TOE) can be used to exclude atrial thrombus in the absence of adequate anticoagulation (2).

TOE can be performed under conscious sedation according to national guidelines (3). However electrical cardioversion always requires the administration of general anaesthetic or deep sedation. This leads to ambiguity in anaesthetic practice when the two procedures are combined. For TOE pre-cardioversion, the period of general anaesthetic can be extended to incorporate the investigative procedure. This is more tolerable for the patient and also reduces the total procedure time. Alternatively, TOE can be performed with or without sedation sometime before the cardioversion. It is not known how frequently each approach is used, and there are no UK or international standards to guide practice.

The aim of this survey was to determine the approaches to performing TOE pre-cardioversion within the UK.

Methods

Identification of echocardiography departments

A list of all NHS hospitals was obtained from the NHS website (www.nhs.uk), and those centres with an echocardiography department were selected and a contact

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email address of the clinical or technical head of echocardiography was obtained.

Questionnaire design

An electronic questionnaire was designed containing a total of ten questions, of which nine had discrete response options about practice and one allowed a qualitative response. It was electronically disseminated to the designated contacts in each identified echocardiography department in February 2015 with three further reminder e-mails to non-responders. The data were reflective of departmental clinical practice at the time of email receipt.

Results

General

One hundred and eighty nine echocardiography departments were identified and 95 (50%) replied, of which 71 (75%) were in a District General Hospital. TOE before cardioversion was not performed in 14 (15%) centres. In those that did perform the procedure, 41 (50%) performed fewer than 10 a year, 31 (38%) between 10 and 50, 8 (10%) between 50 and 100, and 4 (5%) performed >100 per year (Fig. 1).

Indication

In 73 (90%) centres, the most common indication was limited anticoagulation before emergency cardioversion,

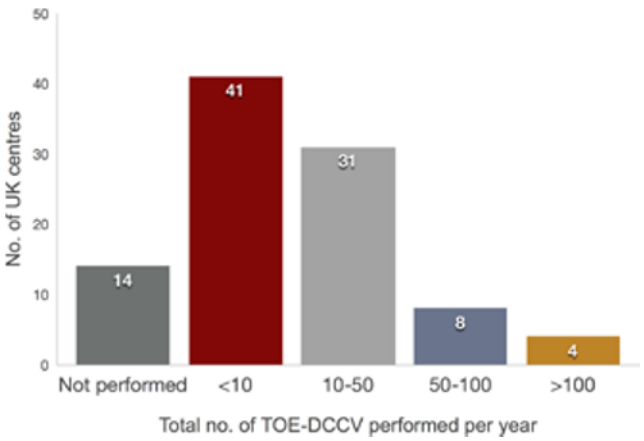


Figure 1
Total number of TOE-guided DCCVs performed by UK centres responding to our questionnaire.

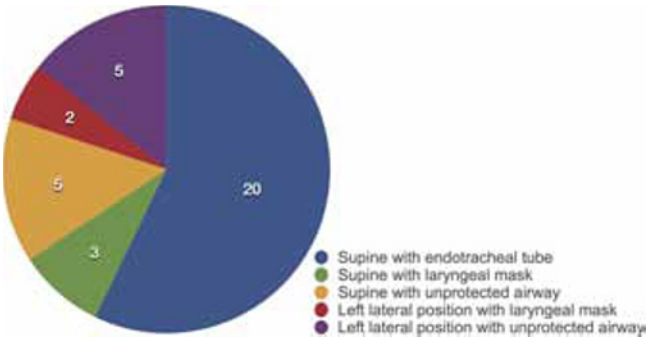


Figure 2
Most frequently adopted patient positions for TOE-guided DCCV under general anaesthetic by a performing centre.

but 45 (56%) centres extended this to elective cardioversion with suboptimal anticoagulation. Cardioversion on a new oral anticoagulant was an indication in 15 (19%) centres.

Who performs the TOE?

A consultant cardiologist performed some or all of the procedures in 79 (98%) of hospitals, a cardiology registrar in 20 (25%), a cardiac sonographer in 10 (13%) and an associate specialist in 2 (2%). A consultant anaesthetist performed the procedure in 7 (9%) and an anaesthetic registrar in 1(1%) centre.

Use of sedation

The TOE was usually conducted under sedation in 67 centres, without sedation in one centre and under general anaesthetic in 16 (20%) centres. An anesthetist was present during conscious sedation in 7 centres. The TOE was performed immediately before DCCV (in the theatre, coronary care unit or catheter lab) in 14 centres. It was carried out in the echo lab immediately before proceeding to DCCV in 17 centres or 1–2 hours before in 10 centres, and sometime that day or occasionally the day before in 9 centres.

TOE under general anaesthetic

This was practiced on occasion in 35 (43%) centres and was the usual or only method in 16 (20%) centres. TOE was performed in the supine position with an endotracheal tube in 20 (57%), a laryngeal mask in 3 (9%) and without airway protection in 5 (14%) (Fig. 2) centres. It was performed in the lateral position without

intubation in 5 (14%) and with a laryngeal mask in 2 (6%) centres.

Any concerns?

Most qualitative reports listed the logistic difficulty of linking TOE and DCCV because of anaesthetic cover. One was concerned that some anaesthetists wanted to perform the TOE in the supine position with an unprotected airway. One was concerned about the danger of intubating under general anaesthetic and always asked the anaesthetist to pass the TOE probe using laryngoscopy.

Discussion

TOE-guided cardioversion is advocated in many guidelines (1, 3, 4), but was not performed in 14 of the centres surveyed and with fewer than ten cases each year in 41 (50%) centres. DCCV is painful and ideally done using general anaesthetic. TOE should ideally be performed under anaesthetic immediately before DCCV to reduce discomfort to the patient and the additive risks of sedation followed by a general anaesthetic. However most centres performed TOE under sedation sometimes many hours before the DCCV. This was usually for logistic reasons, e.g. anaesthetic availability.

Most centres using general anaesthetic protected the airway using intubation or a laryngeal mask and 5 centres carried out the study in the left lateral position without intubation. However, 5 centres performed the TOE in the supine position without airway protection. We believe that anaesthetists may decide that the risks of a short TOE may be less than that from intubation. An abbreviated TOE study focused on the left and right atria alone is usually sufficient. However if concurrent pathology is identified by transthoracic echocardiography before cardioversion, e.g. mitral valve prolapse, then a full study can be useful to evaluate this pathology. However, both abbreviated and full studies carry the risk of inhalation of vomit or secretions (5, 6) and we believe that TOE is unsafe without airway protection, particularly in patients with known gastro-intestinal reflux.

Conclusion

This survey shows that pre-DCCV TOE is relatively infrequently used and there are significant limitations in the services at most centres. We propose the development of national standards to aid practitioners in developing business cases to extend their services.

Declaration of interest
The authors declare that there is no conflict of interest that could be perceived as prejudicing the impartiality of the research reported.

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