Transoesophageal atrial pacing in management of arrhythmias among pediatric patients

Thesis

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List of Abbreviations

AAIT mode	Atrial pacing-Atrial sensing-inhibiting tachycardia
ACC	American college of cardiology
AF	Atrial fibrillation
AHA	American heart association
ANF	Atrial Natriuretic Factor
AP	Accessory pathways
ASD	Atrial septal defect
AV	Atrioventricular
AVNRT	Atrioventrivular nodal re-entry tachycardia
AVRT	Atrioventricular re-entry tachycardia
bpm	Beats per minute
CARTO	Non-fluoroscopic electroanatomical magnetic mapping system
CHB	Complete heart block
CHF	Congestive heart failure
CR	Current Reconstruction
DC	Direct current
DCM	Dilated cardiomyopathy
DDD	Dual chambered pacing , sensing & dual response.
ECD	Equivalent Current Dipole
ECG	Electrocardiogram
EMD	Effective Magnetic Dipole
EPS	Electrophysiological study
ERP	Effective refractory period

Fig.	Figure
Fr	French
HB	Heart block
HBE	His Bundle Excitation
HF	High frequency
HOCM	Hypertrophic obstructive cardiomyopathy
HRV	Heart rate variability
IAP	Incremental atrial pacing
ILRS	Implantable loop recorders
K+	Potassium
LF	Low frequency
LQTS	Long QT syndrome
MCG	Multichannel magnetocardiographic
MCT	Mobile cardiovascular telemetry
MI	Myocardial infarction
MRI	Magnetic resonance imaging
Msec.	Millisecond
Na+	Sodium
NAPA	N-acetyl procainamide
ODP	Overdrive atrial pacing
PJRT	Permanent form of junctional reciprocating tachycardia
PNN50	The percentage of adjacent R-R intervals that varied by more than 50 s
PNS	Phrenic nerve stimulation
PS	Pulmonary stenosis
PSVT	Paroxysmal supraventricular tachycardia
QTD	Q-T dispersion
rMSSD	The root mean square of the difference between

	the coupling intervals of adjacent R-R intervals
SA	Sinoatrial
SAECG	Signal-averaged ECG
SDANN	Standard deviation of the averaged normal sinus R-R intervals for all 5 minute segments of the entire recording
SDNN	Standard deviation of all normal sinus R-R intervals
SDNN index	Mean of the standard deviations of all normal sinus R-R intervals for all 5 minute segments of the entire recording
Seq. p	Sequential AV pacing
SNRT	Sinus node recovery time
SSS	Sick sinus syndrome
SVT	Supraventricular tachycardia
TAP	Transesophageal atrial pacing
Tbx	T_Box
TEAP	Transesophageal atrial pacing
TGA	Transposition of the great arteries
TOF	Tetralogy of Fallot
TTMS	Transtelephonic electrocardiographic event monitors
TWA	T wave alternans
VSD	Ventricular septal defect
VT	Ventricular tachycardia
WPW	Wolff-Parkinson-White
3D	Three-dimensional

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Introduction

Palpitation is an unpleasant awareness of a rapid heart beat & may be a terrifying event for children. Sometimes, in infants & young children, parents notice a paroxysmal rapid pulse by observing fluttering in the neck or pounding in the chest of their children ***(Ko et al., 2004).***

However, routine methods often fail to document episodic arrhythmia because the episodes may be brief, infrequent or both ***(Bubolz & Case., 1999).***

Transoesophageal cardiostimulation is a semiinvasive method of stimulation of atrii enabling the performance of the programmed atrial stimulation without the inevitability of an invasive vascular approach ***(Behulova et al., 1997).***

Transesophageal atrial stimulation has proved to be a useful diagnostic tool in the management of paroxysmal supraventricular tachycardia (SVT) ***(Haaland et al., 2003).***

Transesophageal atrial pacing can be considered as a valid therapeutic device for the management of re-entry SVTs occurred during general anaesthesia, resulting it effective, safe and easy-practicable ***(Romano et al., 2003).***

The technique of transesophageal electrocardiographic (ECG) recording and atrial pacing is a minimally invasive tool with a wide spectrum of clinical application in the pediatric age group ***(Hessling et al., 2003).***

The technique is especially suitable for the evaluation and management of SVT in newborns and infants and with its easy reproducibility offers the potential to learn more about the natural history of accessory connections ***(Hessling et al., 2003).***

Transoesophageal stimulation of the atria is a good & sensitive test & can be recommended in WPW syndrome as a screening examination in particular in junior subjects. To assess the risk of sudden death in subjects with this syndrome it is, however, necessary to evaluate the complex of all assembled data, as the shortest R-R interval in induced atrial fibrillation is not sufficiently specific ***(Vanier et al., 1992).***

Transoesophageal atrial pacing with an easily swallowed pill electrode is safe, well tolerated, and is as efficacious as direct current cardioversion (DCC) for refractory atrial flutter ***(Tucker & Wilson., 1993).***

Transoesophageal atrial pacing is a safe & effective means of terminating atrial flutter in the pediatric population ***(Rhodes et al., 1995).***

Transoesophageal atrial pacing is a practical, safe and effective method for emergency cardiac pacing ***(Paul et al., 1993).***

It can be applied satisfactorily in children undergoing cardiac surgery. If urgent cardiac pacing must be applied in these patients, TEAP would be a choice ***(Sung et al., 1995).***

Aim of work

The present work aims at:

. Estimating the efficacy and applicability of transoesophageal atrial pacing in terminating SVT in pediatric patients.

. Defining the characteristics of SVT to help efficient management which will be compared to other lines of intervention.