



A051

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 Room Hall B1-Area C

Cerebral Oximetry Monitoring during Transapical Aortic Valve Replacement

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INTRODUCTION:

The transapical aortic valve implantation (TAVI) is an established technique for high-risk patients requiring aortic valve replacement. In particular in patient older than 75 years the risk of cerebral injury after cardiac surgery is highly increased [1].

During TAVI rapid ventricular pacing (rp) is required to enable precise positioning of the valve. These periods of reduced or suspended cardiac output may cause impaired organ perfusion and in particular hypoxemia of the brain. Transcranial cerebral oximetry (TCO) is a non-invasiv method to detect cerebral hypoxia [2,3].

METHODS:

From 10/2009 to 02/2010 20 patients were scheduled for TAVI [Sapient, Edwards Lifesciences, Irvine CA, USA] (Table 1). TCO [EQUANOX 7600, Nonin Medical, Plymouth MN, USA] was used for neuromonitoring to quantify the impact of rapid pacing on cerebral oxygenation. Regional oxygen saturation (rSO₂) of both frontal lobes as well as hemodynamic data were recorded continuously throughout the operation.[table1]

RESULTS:
 The quality of signal acquisition was excellent throughout the operation. During rapid pacing of duration longer then 5 seconds a bilateral decrease of cerebral oxygenation was apparent in all patients. All patients were paced with a rate of 180 /min. The mean time of rapid pacing during implantation was 22 ±3 s. The mean drop of rSO₂ was 3.5 ±2.2%. Baseline values were reached after a mean period of 53 ±35s after termination of rapid pacing. Rapid pacing during valve dilatation was shorter and changes in rSO₂ less distinct compared to valve implantation (Table 2). In no patient that was monitored with TCO neurologic complications were detected postoperatively.[table2]

CONCLUSION:
 rSO₂ reacts promptly to functional circulatory arrest during rapid pacing, and recovers fast after termination. TCO provides fast information about changes in cerebral perfusion during TAVI.

REFERENCES:

- [1] Ahonen J, Salmenperä M. Brain injury after adult cardiac surgery. Acta Anaesthesiol Scand 2004;48:4-19.
- [2] Smythe PR, Samra SK. Monitors of cerebral oxygenation. Anesthesiol Clin North America 2002;20:293-313.
- [3] Muehlschlegel S, Lobato EB. Con: all cardiac surgical patients should not have intraoperative cerebral oxygenation monitoring. J Cardiothorac Vasc Anesth 2006;20:613-5.

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Demographic data, perioperative risk and outcome

demographic data	age	79 ±8 years
	gender	12 (60%) female
perioperative risk	STS score	25 ±13 %
	logistic EUROscore	31 ±15 %
outcome	major stroke	0 (0%)
	30-day mortality	1 (5%)

Hemodynamic and cerebral oxygenation during rapid pacing

		dilatation	implantation
rapid pacing (rp)	rate of rp (1/min)	180	180
	duration of rp (s)	11 ±5	22 ±3
hemodynamic	MAP before rp (mmHg)	75 ±12	74 ±10
	[start_en]0394; MAP after rp (mmHg)	-20 ±12	-19 ±18
	NE before rp (mg/h)	0.32 ±0.17	-
	NE 5 min after rp (mmHg)	-	0.34 ±0.15
cerebral oxygenation	max. drop of rSO ₂ %	3.5 ±1.6	3.5 ±2.2
	time to recover	48 ±46	53 ±35