Induced hypotension in skull-base surgery: does it affect incidence of complications and length of stay?

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Introduction

- Skull-base surgery requires controlled intra-operative hypotension and careful blood pressure management due to the nature of surgery.
- Intra-operative hypotension has been associated with an increased risk of stroke [1], acute kidney injury, myocardial infarction [2] as well as poor outcome following brain injury [3,4].
- Currently there is no consensus definition of intra-operative hypotension [5] although an intra-operative reduction of > 30% in mean arterial pressure is associated with increased risk of stroke [1], and a duration of > 20 min reduction with increased cardiac and renal morbidity [2].
- The aim of the service evaluation was to assess the impact of intra-operative hypotension on complications and length of stay on patients undergoing skull base surgery.

Methods

- Retrospective case-note review of all patients undergoing skull base surgery from January 2010 to July 2013
- Data collected included demographics, surgical data, post-operative complications and length of hospital stay
- Lowest intra-operative invasive blood pressure and duration of hypotension recorded from anaesthetic chart and compared to baseline
- Baseline blood pressure was identified from pre-operative assessment
- 103 patients identified, 100 sets of cases notes obtained and reviewed.

Results

	Maximum decrease in intra-operative systolic blood pressure: decrease form baseline.			
	20-30% [n=15]	30-40% [n=35]	40-50% [n=36]	>50% [n=12]
Demographics:				
Age [mean]	41.3	46.8	53.7	59.3
Gender [male:female]	6:9	18:17	21:15	5:7
Cardiovascular co-morbidities:				
IHD/Structural disease	1	0	1	0
Stroke	0	0	0	0
Diabetes Mellitus	1	0	0	1
Hypertension	0	6	13	8
Tumour size[% patient]:				
Small [<1.5cm)	13	23	28	8
Medium [1.5-2.5cm]	27	29	39	17
Large [>2.5cm)	60	49	33	75
Surgical approach:				
Translabyrithine	4	17	25	3
Retrosigmoid	11	18	11	9
Mean length of stay [SD] days: *	9.6 [±6.4]	8.6 [±4.6]	9.6 [±6.9]	11.6 [±4.4]
Incidence complications [%]:	46	63	50	58

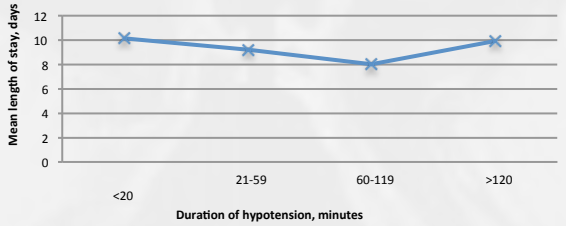
* p=0.493 for difference between groups [one-way ANOVA]

- The majority of patients had a significant decrease drop in intra-operative blood pressure There was no statistically significant association between degree and duration of hypotension, and length of stay or post-operative complications
- Controlled intra-operative hypotension was well tolerated by patients and there were no reported incidences of acute kidney injury or strokes during this time.
- One patient had an episode of fast atrial fibrillation post-operatively with no haemodynamic compromise. This was associated with only brief intraoperative hypotension (<20 minutes).

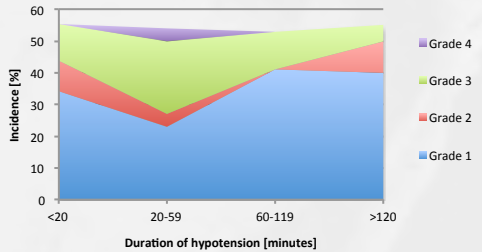
	Duration of hypotension [minutes]			
	<20 [n=35]	21-59 [n=26]	60-119 [n=17]	>120 [n=20]
Tumour size [%]:				
Small	5	6	5	5
Medium	11	6	2	11
Large	19	14	10	4
Surgical approach:				
Retrosigmoid	12	13	7	17
Translabyrinthine	23	13	10	3

p=0.652 for difference between groups [one-way ANOVA]

Duration of hypotension vs. length of stay



Incidence of grades of complications



Conclusions

- Although this is a small sample size, it suggests that surgically required hypotension can be achieved safely in these patients.
- To further develop our knowledge and understanding of the risk faced by this cohort of patients we propose prospectively collecting data on intra-operative hypotension and outcome.
- All our patients have careful peri-operative care including routine admission to the high-dependency unit post-operatively and this ensures consistent high-quality of care.

References:

1. Bijker et al Anesthesiology 2012 [116]; 3: 658-664
2. Walsh et al Anesthesiology 2013 [119]; 3: 507-515
3. Chang et al Journal of Neurosurgery 2000 [p92];6:971-975
4. Pietropaoli et al Journal of Trauma-Injury Infection & critical care 1192 [33];3:403-407
5. Bijker et al Anesthesiology 2009 [111];6:1217-1226