

# Body Weight Changes In Patients With Active Cushing's Disease After Transsphenoidal Surgery

Philip C Johnston<sup>1</sup>, Laurence Kennedy<sup>1</sup>, Amir Hamrahian<sup>1</sup>, Jim Bena<sup>2</sup>, Robert Weil<sup>3</sup>  
 Dept of Endocrinology, Diabetes and Metabolism<sup>1</sup> and Biostatistics<sup>2</sup>, Cleveland Clinic, OH, USA  
 Dept of Neurosurgery, <sup>3</sup>Geisinger Health System, Danville, PA, USA

## INTRODUCTION

- Cushing's disease (CD) is usually associated with alterations in body mass index. Successful pituitary surgery can result in long term remission with sustained weight loss.
- We examined rates of body weight change (in the post-operative period within 6 months) in patients with active CD who underwent transsphenoidal surgery (TSS) and the relationship of weight loss to remission status.

## METHODS

- Clinical data was obtained from a CD database in addition to an online patient medical record (EPIC).
- All patients with biochemically confirmed active CD underwent their first TSS by a single neurosurgeon at the Cleveland Clinic: (October 2004 to August 2013).
- None of the patients received glucocorticoids during surgery.
- Initial remission was defined by nadir cortisol <5 µg/dl and/or ACTH <5 pg/ml within the immediate post-operative period (72 hrs).
- Long term remission (≥ 12 months) was defined as 24 hr UFC < ULN (upper limit of normal), and/or sequential midnight salivary cortisols <ULN, and 1mg DST; 8am cortisol <1.8 µg/dl.
- Statistical analyses were performed using SAS software (Version 9.2; Cary, NC).

## RESULTS

- Data was available for 88 patients (F:63,M:25), mean age at presentation was 47 years (range 24-87 years), median follow up 52 months (12-118 months).
- No significant differences in baseline demographics including pituitary adenoma size (p=0.25) and BMI (p=0.21) were observed between the two groups.
- 64 had pituitary microadenoma (or no visible tumour), 24 were macroadenoma.
- 74 (84%) patients had initial remission after surgery, during follow up 6 of those with initial remission had recurrence of CS.

## CONCLUSION

- After TSS for CD, weight loss within the first six months maybe an additional clinical indicator associated with early biochemical and current remission status.

## RESULTS

- Those with initial remission had greater mean SD weight loss at 3 months (kg:-8.1 11.3 [initial remission, n=59] v 0.8 8.8 [non-remission, n=12], p=0.007) and at 6 months (kg:-14.5 12.1 [initial remission, n=46] v -6.1 12.1 [non-remission, n=12], p=0.045) **Table 1**.
- There was evidence that less weight loss or weight gain at three (p=0.002) and six (p=0.014) months was associated with increased risk of relapse **Table 2**.
- At most recent follow up, weight loss after TSS within the first 3 (p=0.019) and weight loss within the first 6 months (p=0.035) was also predictive of current remission status.

**Table 1** Weight change outcome by initial remission status

	No Remission (N=18)	Initial Remission (N=83)	p value
<b>Weight Change:</b>			0.18
Missing	4 (%)	9 (%)	
No Loss or Increase	8 (57.1%)	28 (37.8%)	
Wgt Loss (>1 kg/mon.)	6 (42.9%)	46 (62.2%)	
<b>Weight Change: 1 Month</b>			0.12
N	13	68	
Mean (SD)	0.4 (4.7)	-2.0 (4.6)	
Median	-0.5	-0.9	
Range	(-6.4-10.3)	(-29.9-3.4)	
<b>Weight Change: 3 Months</b>			0.007
N	12	59	
Mean (SD)	0.8 (8.8)	-8.1 (11.3)	
Median	-1.2	-5.0	
Range	(-6.6-25.4)	(-77.1-2.2)	
<b>Weight Change: 6 Months</b>			0.045
N	12	46	
Mean (SD)	-6.1 (12.1)	-14.5 (12.1)	
Median	0.0	-13.7	
Range	(-26.0-9.8)	(-76.3--0.3)	

**Table 2** Differences in weight loss over time between remission and non remission

Variable	Time	Frequency	Hazard Ratio (95% CI)	Overall
Wgt Change	Month 1	81	1.14 (0.99, 1.29)	0.056
	Month 3	71	1.08 (1.03, 1.14)	0.002
	Month 6	58	1.08 (1.02, 1.15)	0.014

## DISCUSSION

- The current study demonstrates that the majority of patients with initial remission after TSS will experience weight loss. Patients with initial non-remission although to a lesser degree can also experience initial weight loss after TSS. The study also confirms that those with initial remission had greater weight loss at 3 and 6 months relative to those without initial remission. Weight changes within the first six months was also predictive of long term remission status.

