Outcomes of first transsphenoidal surgery(TSS) for acromegaly

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Introduction

Background

- Acromegaly is a disabling condition associated with increased morbidity and mortality due to excess deaths from cardio-respiratory and malignant diseases
- Prevalence is estimated at 40-60 per million
- Incidence 3-4 per million per year

Background

- Treatment of acromegaly reduces mortality
- Pituitary surgery is the initial treatment for the majority of patients
- The UK acromegaly register data (UK-AR-2) suggests that surgical remission rates vary widely, with a marked improvement since 2000.

Aim of study

- To assess the biochemical cure rate of acromegalic patients treated with first TSS
- To assess pre and post operative pituitary hormone deficiencies
- Compare results with other centres

Methods

- Retrospective analysis
- All patients who underwent first TSS for acromeagly between 2007 and 2011
- Remission rates analysed at 3 months post surgery
- Deficiencies defined as low hormone levels or patient on replacement
- Post op deficiencies taken at 6 weeks after surgery

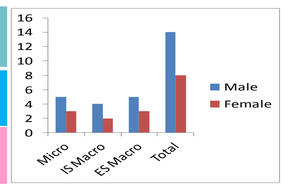
- Biochemical remission analysed with respect to IGF1 levels, GH levels and IGF1+GH combined
- Remission defined as normalisation of IGF1 for age and sex matched reference range
- GH nadir <1mcg/L post-GTT, or <2mcg/L (random GH or series mean)

Results

- 22 first TSS operations over the 5 year period
- 2 surgeons
- 2.2 acromegaly operations /year/surgeon
- 8 microadenomas
- 6 intrasellar (IS) macroadenomas
- 8 extrasellar (ES) macroadenomas

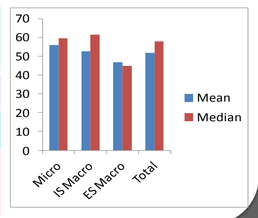
Patient Characteristics

Gender	Micro	IS Macro	ES Macro	Total
Male	5	4	5	14
Female	3	2	3	8



Patient Characteristics

Age at Surgery	Micro	IS Macro	ES Macro	Total
Mean	56	52.6	46.75	51.72
Median	59.5	61.5	45	58
Range	36-76 (40)	23-75 (52)	28-60 (32)	23-76 (53)

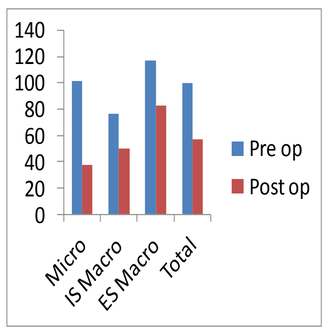


Pre & Post Op IGF1levels(Ref 13-50 nmol/L)

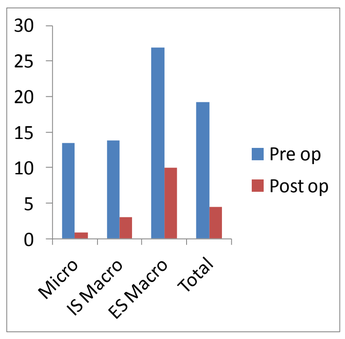
Pre Op	Micro	IS Macro	ES Macro	Total
Mean	101.4	76.11	116.71	100.01
Median	98.3	77.3	106.5	93.5
Range	53.3-164.8 (111.5)	52.9-94 (41.1)	78.3-238 (159.7)	52.9-238 (185.1)

Post Op	Micro	IS Macro	ES Macro	Total
Mean	37.73	49.65	82.55	57.28
Median	34.85	43.25	67.15	57.05
Range	16.9-65.3 (48.4)	19-86.1 (67.1)	36.8-149 (112.2)	16.9-149 (132.1)

Mean IGF1 nmol/L



Mean GH mcg/L



Pre & Post Op GH levels mcg/L

Pre Op	Micro	IS Macro	ES Macro	Total
Mean	13.5	13.79	26.96	19.26
Median	11.1	8.6	17.8	11.1
Range	1.6-34.1 (32.5)	6.66-36.9 (30.24)	7.96-79 (71.04)	1.6-79 (77.4)

Post OP	Micro	IS Macro	ES Macro	Total
Mean	0.86	3.05	9.965	4.43
Median	0.96	1.265	6.48	1.08
Range	0.1-1.62 (1.52)	0.14-12.5 (12.36)	0.55-28.3 (27.75)	0.1-28.3 (28.2)

Remission Rates Achieved

Size (Number of pts)	IGF1	GH	IGF1+GH	
Micro (8)	6 (75%)	7 (88%)	5 (62.5%)	1 pt GH level not available
IS Macro (6)	3 (50%)	4 (66.6%)	3 (50%)	
ES Macro (8)	1 (12.5%)	2 (25%)	1 (12.5%)	2 pt GH levels not available
Total (22)	10 (45.4%)	13 (68.4%)	9 (47.36%)	3 pt GH levels not available

Post op GH levels not available for 3 pts, 1 Micro and 2 ES Macro

Pre & Post Op Pituitary Axis Deficiencies

Size (Number of Patients)		TSH		Gonadotrophin		ACTH		ADH	
		Number results available	Def (%)	Number results available	Def (%)	Number results available	Def (%)	Number results available	Def (%)
Micro (8)	Pre Op	8	0	6	3 (50)	6	1 (16.6)	8	0
	Post Op	8	0	8	3 (37.5)	8	0**	8	0
IS Macro (6)	Pre Op	6	0	5	2 (40)	6	0	6	0
	Post Op	6	0	5	0	6	2 (33.3)	6	0
ES Macro (8)	Pre Op	8	0	8	2 (25)	7	0	8	0
	Post Op	8	0	6	1* (16.6)	8	3 (37.5)	8	0
Total (22)	Pre Op	22	0	19	7 (36.8)	19	1 (5.2)	22	0
	Post Op	22	0	19	4 (21)	22	5 (22.7)	22	0

* Post Op Gonadotrophin deficiency in a patient who had normal levels pre op
** 1 pt remained on Steroids for tiredness, though SST normal
Deficiency percentage calculated for the number of results available

Pre & Post Op Imaging

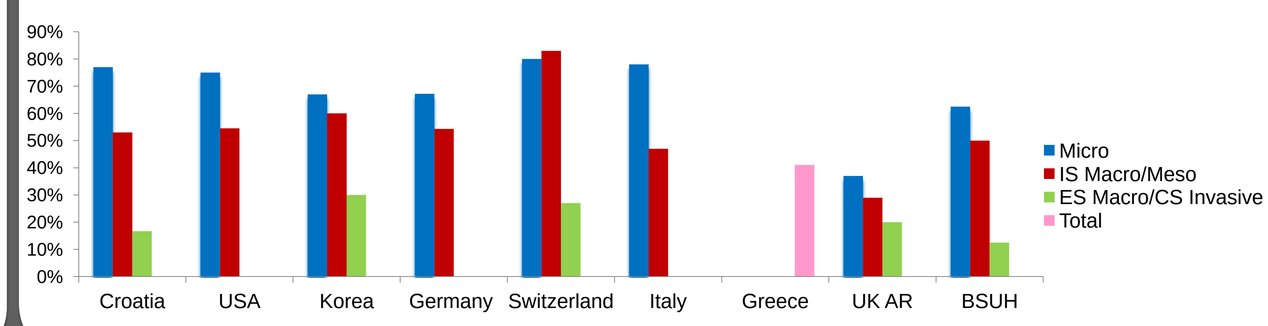
Pre Op Size		Post Op Size			
	Number of patients	No Residual	Micro	IS Macro	ES Macro
Micro	8	3 (37.5%)	5 (62.5%)		
IS Macro	6	4 (66.7%)	1 (16.7%)	1 (16.7%)	
ES Macro	8	2 (25%)	3 (37.5%)	0	3 (37.5%)
Total	22	9 (40.9%)	9 (40.9%)	1 (4.5%)	3 (13.6%)

*2 pre op scans available are CT scans
*Post Op imaging is by non contrast MRI

Comparative Data

- 8 published series since 2000
- Mean biochemical remission rates following TSS in those 8 series are 78% for micro, 59% for IS macro & 25% for ES macroadenomas
- Most are from large international centres
- Some studies only report outcomes for multimodal therapy
- Remission rates have globally improved since 2000

Remission rates for IGF1+ GH in studies published since 2000



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Conclusion

How many pituitary centres the UK should have for optimal outcomes, and whether centres should have one or two pituitary surgeons, remains an active debate.
Regular collection and reporting of surgical outcome data is essential to inform pituitary service provision .