

Acromegaly Management

Local Surgical Outcomes

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Acromegaly – background

- TSR is the first line treatment in acromegaly in suitable patients
 - Katznelson L et al **Acromegaly: An Endocrine Society Clinical Practice Guideline**. *The Journal of Clinical Endocrinology & Metabolism*, Volume 99, Issue 11, 1 November 2014, Pages 3933–3951
- Current ‘strict’ definition of ‘cure’
 - IGF-1 within reference range
 - GH
 - Random GH < 1.0 ug/L
 - AND/OR OGTT nadir <0.4 ug/L
 - Giustina A et al **A Consensus on Criteria for Cure of Acromegaly**. *The Journal of Clinical Endocrinology & Metabolism*, Volume 95, Issue 7, 1 July 2010, Pages 3141–3148

Acromegaly outcomes

- Nottingham – regional neurosurgical unit
- Reviewed outcome after TSR for acromegaly
- Criteria
 - TSR and follow-up in Nottingham
 - Primary surgery 2010 to date

Iain Robertson, Graham Dow – pituitary surgeons

Nottingham patients - Demographics

- Number 19. M 5, F 14
- Age range 22-79 (median 51) yrs
- Tumour size – ALL macroadenomas (at least one dimension on MR > 1cm) 4 had cavernous sinus invasion
- Recorded GH/IGF-1 6-12 months post surgery and most recent (if no further treatment)

Nottingham patients - outcomes

GH/IGF-1

6-12 months

	N/N	↑/N	N/↑	↑/↑		
Latest	N/N	8	1	2	1	Remission -12
	↑/N		1	1		Intermediate -3
	N/↑			1		
	↑/↑			1	3	Not cured - 4

N=19

Nottingham patients intermediate/not cured

- Intermediate – 3. Borderline results. All on 'wait and see' follow-up
- Not cured – 4. (The same 4 that had CS invasion on MR scan)
 - Watching – wants a family
 - Sandostatin/DXT
 - Sandostatin/SRS
 - Pasereotide study

Nottingham surgical cure rate

- Definite remission
 - $12/19 = 63\%$
- Definite remission and intermediate
 - $15/19 = 79\%$

Derby outcomes

- Same criteria
- 3 patients – 1 micro, 2 macroadenoma
- 1 – not cured – on lanreotide
- 2 – intermediate – GH > 1.0 ug/L, normal IGF-1

Leicester outcomes

- Audit from 2005
- Same outcome criteria
- Only looked at post-op GH/IGF-1
- 25 patients
 - **9 micro-adenomas – 100% surgical remission**
 - **16 macro-adenomas – 56% surgical remission (9/16)** – all remainder currently in medical remission – 2 had external beam DXT, 5 gamma knife, 5 on sst-analogues, 1 on pegvisomant
 - **All macro-adenomas not immediately in surgical remission had cavernous sinus invasion so would not expect surgical cure.**

Surgical outcomes for TSR in acromegaly in Nottingham region

- Remission rates (2010 criteria)
 - Microadenoma – 90% (one borderline)
 - Macroadenoma – 57%

Comparative studies

- [Starnoni D](#) et al Surgical treatment of acromegaly according to the 2010 remission criteria: systematic review and meta-analysis. [Acta Neurochir \(Wien\)](#). 2016 Nov;158(11):2109-2121.
- **13 studies, 1105 patients. (Some older studies)**
- **Remission rates after primary TSR**
 - Overall 54.8% (95% CI 44.4-65.2)
 - Microadenoma 77.9% (68.1 – 87.6)
 - Macroadenoma 52.7% (41-64.4)
- **Noted a high proportion of intermediate outcomes (14-47%) with one of GH/IGF-1 raised, the other normal.**

What about the IGF-1 reference range?

Table 6. Adult Reference Ranges

Age (yr)	Median (ng/mL)	Central 95% Range (ng/mL)
19 to 21	207	105 – 346
22 to 24	175	107 – 367
25 to 29	160	88 – 537
30 to 34	136	41 – 246
35 to 39	126	57 – 241
40 to 44	122	43 – 209
45 to 49	120	74 – 196
50 to 54	108	55 – 248
55 to 59	108	36 – 200
60 to 64	112	51 – 187
65 to 69	110	37 – 219
70 to 79	92	24 – 200
80 to 90	94	17 – 323

New manufacturer derived IGF-1 reference ranges.
IMMULITE 2000/XPi IGF1 assay Siemens

Implemented NUH 12 June 2017

Acromegaly outcomes

Discussion points

- Good primary surgical outcomes
- Significant numbers with an ‘intermediate’ (and variable) outcome – how to assess? what to do?
- Issues with the IGF-1 age related reference ranges.