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NHS Foundation Trust

HOW DO I PREPARE A PATIENT FOR PITUITARY SURGERY

Angelos Kolias MD, MSc, PhD, FRCS (SN)

Senior Clinical Lecturer / Hon. Consultant Neurosurgeon
Dept. of Clinical Neurosciences

DISCLOSURES

- Dr Kolias has no disclosures

FIVE-STEP PROCESS

- Careful patient selection
- Hormonal assessment and replacement
- Anaesthetic assessment and optimisation
- “Consenting” clinic / patient education
- Careful review of pre-operative imaging

CAREFUL PATIENT SELECTION

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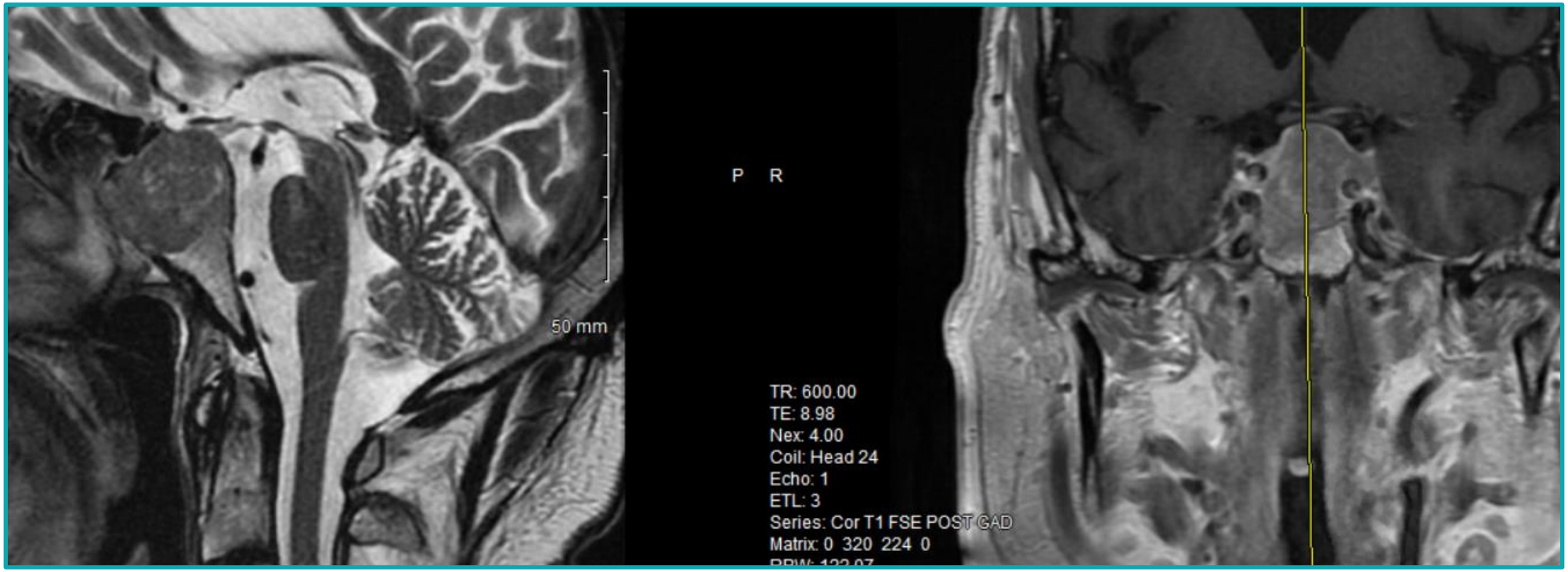
- Age, comorbidities
- What are the indications for surgery?
  - Mass effect
    - Is vision compromised?
      - Assessment by ophthalmologist necessary
    - If not, is the optic apparatus at risk?
    - If not, is the lesion growing?
  - Hormonal hypersecretion
    - (Is vision at risk?)
    - Is cure likely / unlikely? If unlikely, can I at least reduce the disease burden?
    - If considering surgery for a prolactinoma, decision to offer surgery should be made jointly with an endocrinologist
    - For equivocal lesions, consider advanced imaging (PET)
  - Tissue diagnosis
    - Review images with an experienced radiologist and ensure full medical work-up prior to surgery (e.g. TB, sarcoid, IgG4 etc)
- If the referral is coming from a non-endocrinologist, see the patient to ensure there are no concerns regarding a hormonal hypersecretion syndrome

AGE AND COMORBIDITIES

- Non-functioning pituitary adenoma



ADVANCED IMAGING

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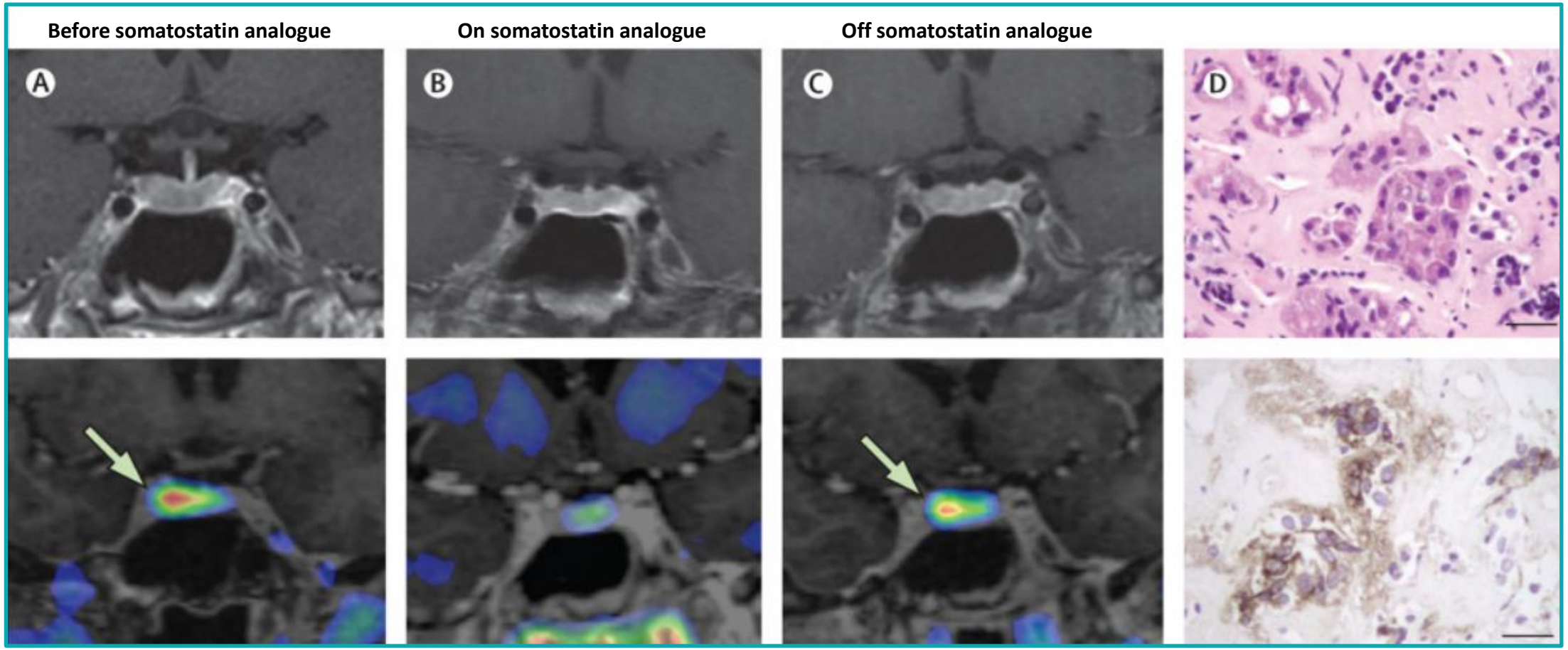
Localisation of an occult thyrotropinoma with ^{11}C-methionine PET-CT before and after somatostatin analogue therapy

Olympia Koulouri, MRCP • Andrew C Hoole, PhD • Patrick English, MD • Kieren Allinson, FRCPath • Nagui Antoun, FRCR • Heok Cheow, FRCR • Prof Neil G Burnet, MD • Neil Donnelly, FRCS • Richard J Mannion, PhD • Dr Mark Gurnell, PhD • Show less

THE LANCET
Diabetes & Endocrinology



Koulouri O, et al. Lancet Diabetes Endocrinol. 2016;4(12):1050.

HORMONAL ASSESSMENT AND REPLACEMENT

HORMONAL ASSESSMENT AND REPLACEMENT

- Routine measurement of 9 AM cortisol, TFTs, PRL, IGF-1, FSH, LH, oestradiol / testosterone
  - Large tumours → consider serial dilution if PRL normal

- Hormonal deficiency
  - Important to assess for secondary adrenal insufficiency and secondary hypothyroidism pre-operatively
    - 9 AM cortisol, Short Synacthen Test +/- start hydrocortisone as necessary
    - Free T4, TSH +/- start L-thyroxine as necessary
    - Hypogonadism, GH deficiency can be re-assessed and treated post-operatively

HORMONAL HYPERSECRETION

- Involve an endocrinologist with appropriate expertise
  - Even a low index of clinical suspicion for Cushing's disease, acromegaly / TSH-oma should prompt further testing (bedtime salivary cortisol, 24-h urine free cortisol, dexamethasone suppression test, ACTH etc)

- Important to know in advance if a tumour is associated with hypersecretion in order to **set appropriate (patient-specific) surgical aims** and inform patient accordingly during consenting process

ANAESTHETIC ASSESSMENT AND OPTIMISATION

PITUITARY ADENOMAS

- Assess and treat hormonal deficiencies pre-operatively

- Usual neuro-anaesthetic considerations apply
  - Cardiovascular, respiratory (and other) comorbidities
  - Any modifiable risk factors?
    - BP, glucose control, smoking, etc
  - Electrolytes, anaemia, clotting abnormalities
    - Opinion from haematologist as necessary
  - Hydrocephalus, raised ICP

CUSHING'S DISEASE

- Several risk factors
  - Hypertension, obesity, diabetes, IHD
- Obesity +/- gastroesophageal reflux disease +/- OSA → difficult airway management
- Hypercoagulability
  - High risk of DVT / PE

- **Medical treatment pre-operatively (e.g. metyrapone)**

ACROMEGALY

- Facial bone and soft tissue hypertrophy (mandible, nose, mouth, tongue, lips, and laryngeal tissue)
  → difficult airway management
- OSA
  - Sleep studies (polysomnography)
  - CPAP (but usually avoided post-operatively for 8 weeks)
- Cardiomyopathy
  - Consider ECHO pre-op
- Impaired glucose tolerance / diabetes
  - Optimise pre-operatively

- **Pre-operative somatostatin analogue therapy** can help optimise physiology and facilitate surgery

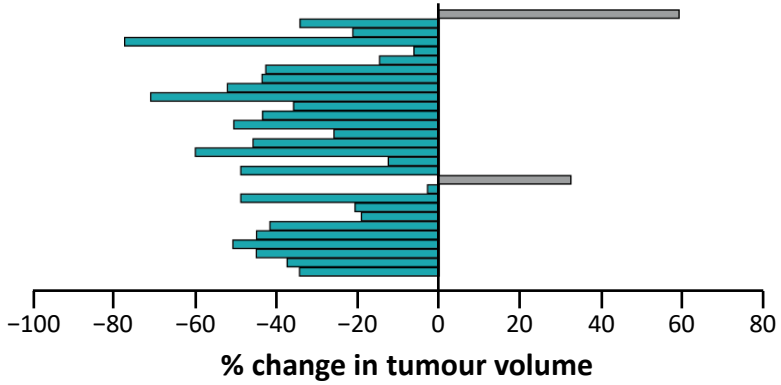
DE NOVO ACROMEGALY

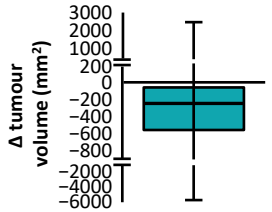
A Comprehensive Study of Clinical, Biochemical, Radiological, Vascular, Cardiac, and Sleep Parameters in an Unselected Cohort of Patients With Acromegaly Undergoing Presurgical Somatostatin Receptor Ligand Therapy FREE

Anand K. Annamalai, Alison Webb, Narayanan Kandasamy, Maysoon Elkhawad, Samantha Moir, Fakhar Khan, Kaisa Maki-Petaja, Emma L. Gayton, Christopher H. Strey, Samuel O'Toole, Shaumya Ariyaratnam, David J. Halsall, Afzal N. Chaudhry, Laurence Berman, Daniel J. Scoffings, Nagui M. Antoun, David P. Dutka, Ian B. Wilkinson, John M. Shneerson, John D. Pickard, Helen L. Simpson, Mark Gurnell ✉

- Lanreotide sc x 6 injections
- 15 men / 15 women

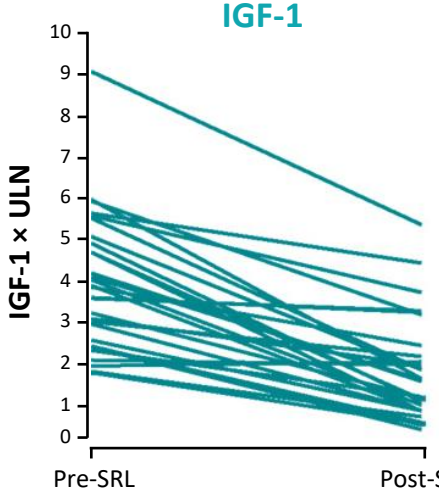
Tumour volume

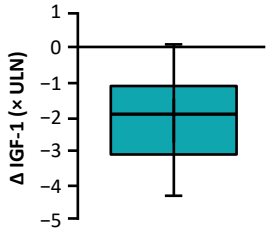




Median change	IQR	P value
−256	−558 to −72.5	0.0002

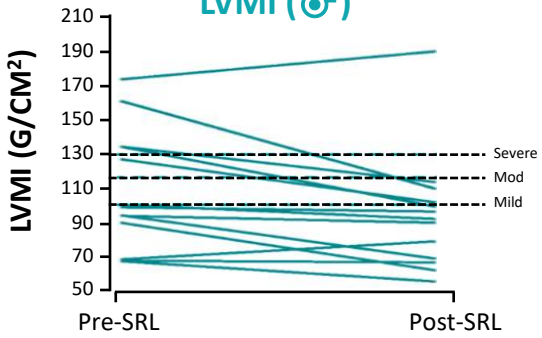
IGF-1

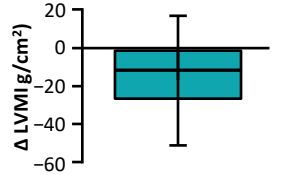




Median change	IQR	P value
−1.95	−3.06 to −1.12	0.000002

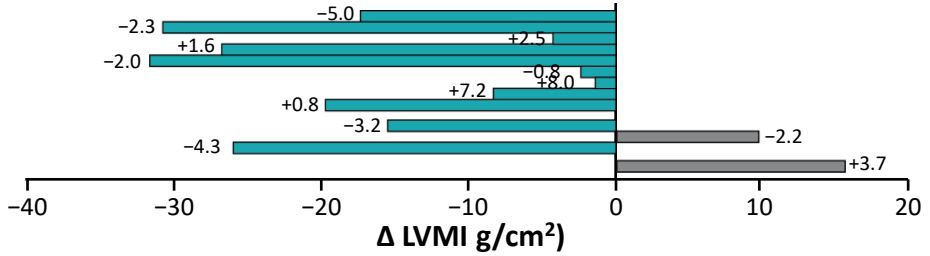
LVMI (♂)





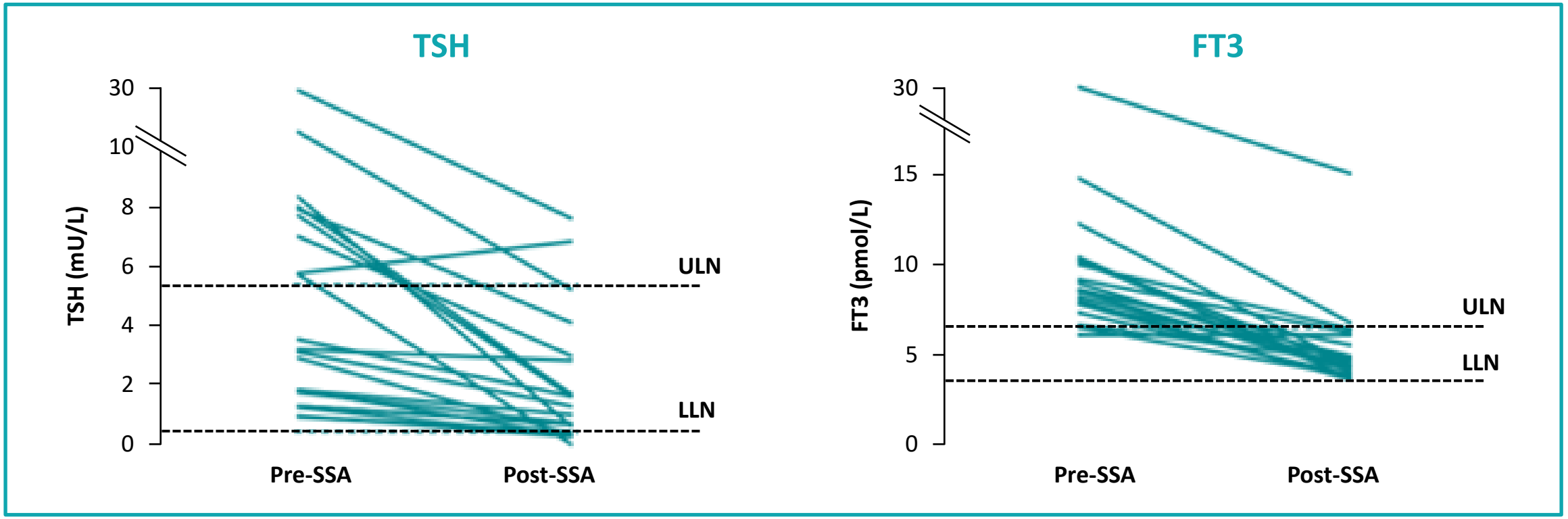
Median change	IQR	P value
−11.8	−26.6 to −1.75	0.019

Changes in LVMI in male subjects and corresponding weight change (kg)



TSH-OMAS

- Hyperthyroidism
  - **Pre-operative SSA** to provide control and lower risk of cardiac arrhythmias



Unpublished data (with thanks to Dr Koulouri, Prof Gurnell)

“CONSENTING” CLINIC / PATIENT EDUCATION

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Outpatient clinic

- Review +/- arrange all pertinent investigations
- Surgery offered

MDT

- Review in pituitary multidisciplinary team meeting / pituitary tumour board
- Decision for surgery supported
  (depending on referral process, MDT may take place before or after outpatient clinic appointment)

Consenting clinic

- See in dedicated “consenting” clinic again – ideally face-to-face and with next-of-kin
- Tailor discussion to individual patient
- Sign consent form

Surgery

- See again on the morning of surgery to answer any further questions and reaffirm consent

DEDICATED PATIENT INFORMATION LEAFLET

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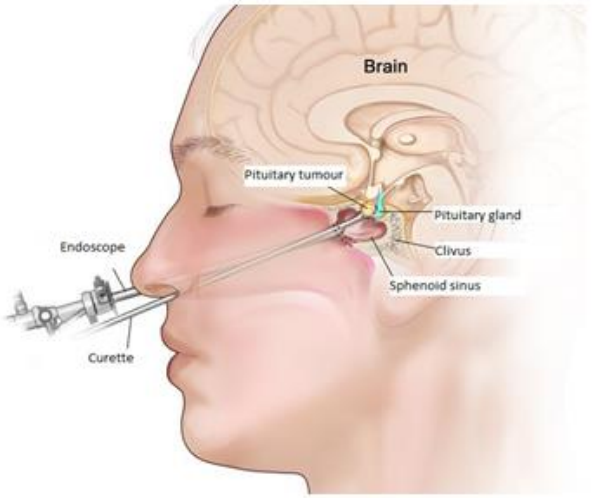
Patient Information

Cambridge University Hospitals NHS Foundation Trust

Patient information and consent to endoscopic trans-sphenoidal resection of a pituitary tumour

During the procedure

The operation is performed under a general anaesthetic, which means that you will be asleep. In this type of operation, Neurosurgeons and ENT (ear, nose, and throat) surgeons work together. The endoscope is placed through the nose. The endoscope is advanced until the sphenoid sinus is found at the back of the nose. The front wall of the sphenoid sinus is then opened followed by the back wall. When the area that houses the pituitary gland and tumour (sella) is entered, the neurosurgeon removes the pituitary tumour in small pieces. When all parts of the tumour that can be reached have been removed, the endoscope is removed.



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The Pituitary FOUNDATION

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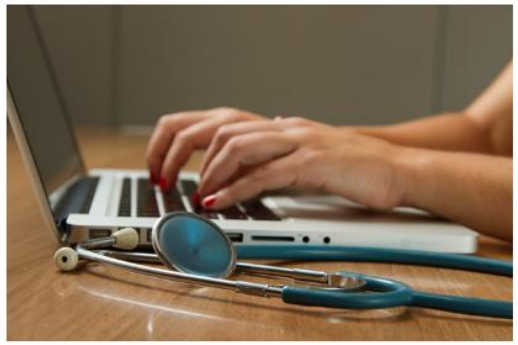
Information for Patients

The pituitary gland and conditions explained

Home > Information

WHAT IS THE PITUITARY



PITUITARY CONDITIONS

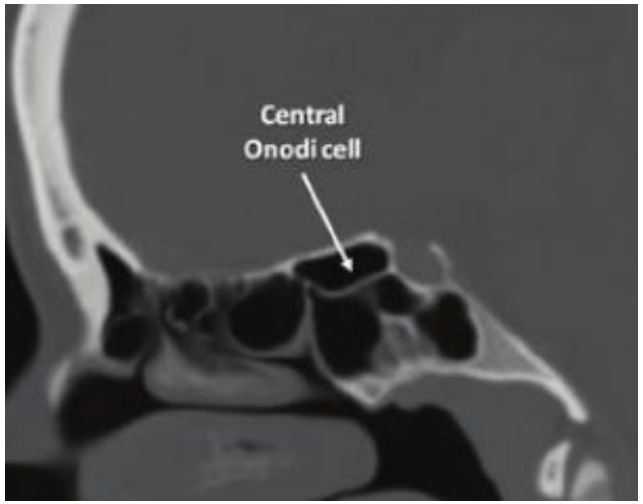
PITUITARY SYMPTOMS +

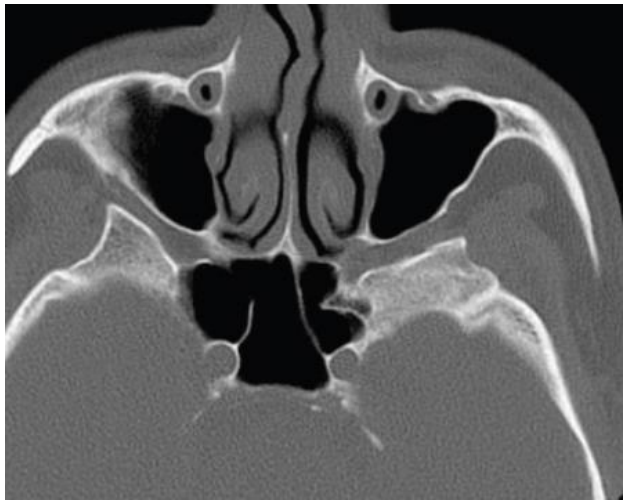
https://www.pituitary.org.uk/information/

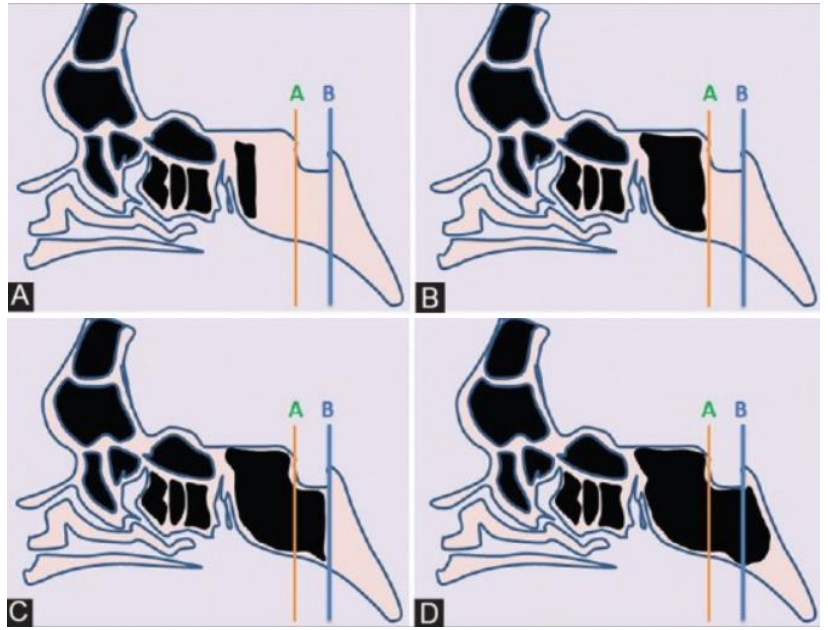
CAREFUL REVIEW OF PRE-OPERATIVE IMAGING

PRE-OPERATIVE MRI (AND OTHER IMAGING AS NECESSARY)

- Sphenoid sinus
  - Pneumatisation
  - Intra-sinus septations in relation to ICA
  - Onodi cell





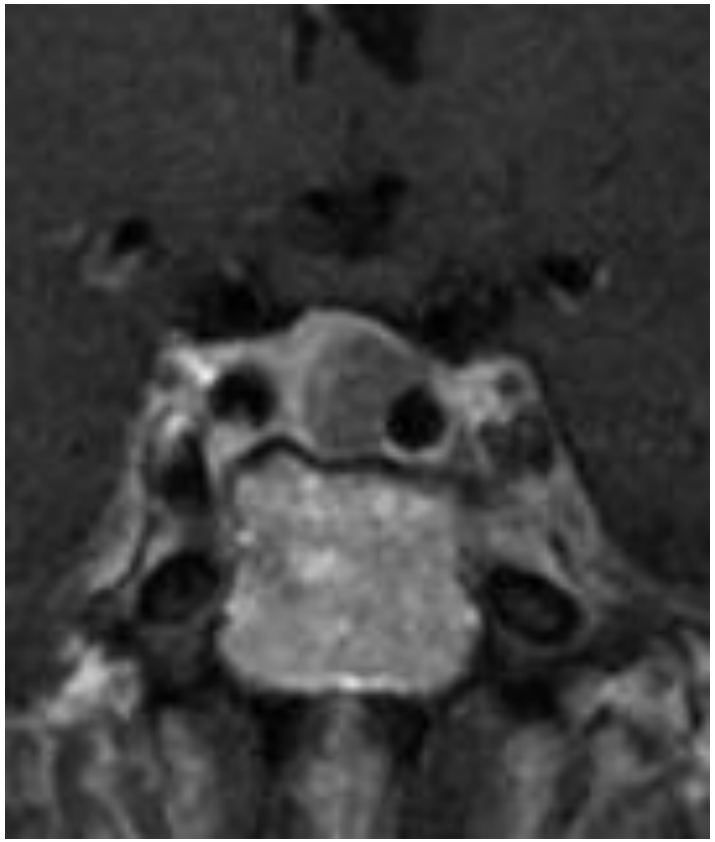


Types of sphenoid pneumatisation. Pictorial representation with vertical lines drawn along the anterior (orange line) and posterior walls (blue line) of the sella. (A) Conchal type; pneumatisation >10 mm anterior to the anterior wall of sella. (B) Presellar type; the posterior margin of pneumatisation anterior to the anterior wall. (C) Incomplete sellar; the posterior margin of pneumatisation beneath the sella, but anterior to the posterior wall of sella. (D) Complete sellar; the posterior margin of pneumatisation, posterior to the posterior wall of the sella

Hiremath SB, et al. Indian J Radiol Imaging. 2018;28(3):273-9

PRE-OPERATIVE MRI (AND OTHER IMAGING AS NECESSARY)

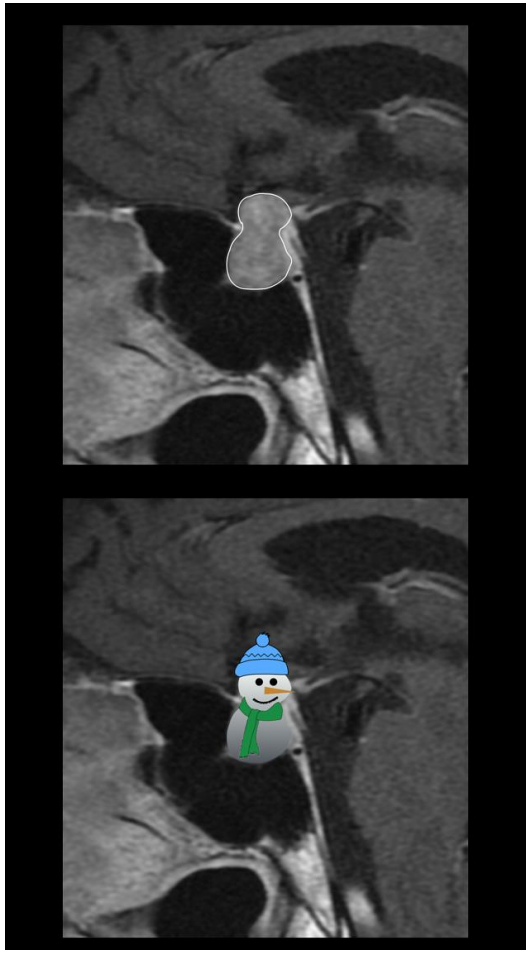
- Shape / size of sella
- Internal carotid artery
  - Position of carotids
  - Inter-carotid distance
  - Tortuous carotids
- Any concerns
  - CTA
  - Doppler
  - Navigation
  - Limited, central, dural opening to start with



=Zada G, et al. Neurosurg Focus. 2010;29(4):E8.

PRE-OPERATIVE MRI (AND OTHER IMAGING AS NECESSARY)

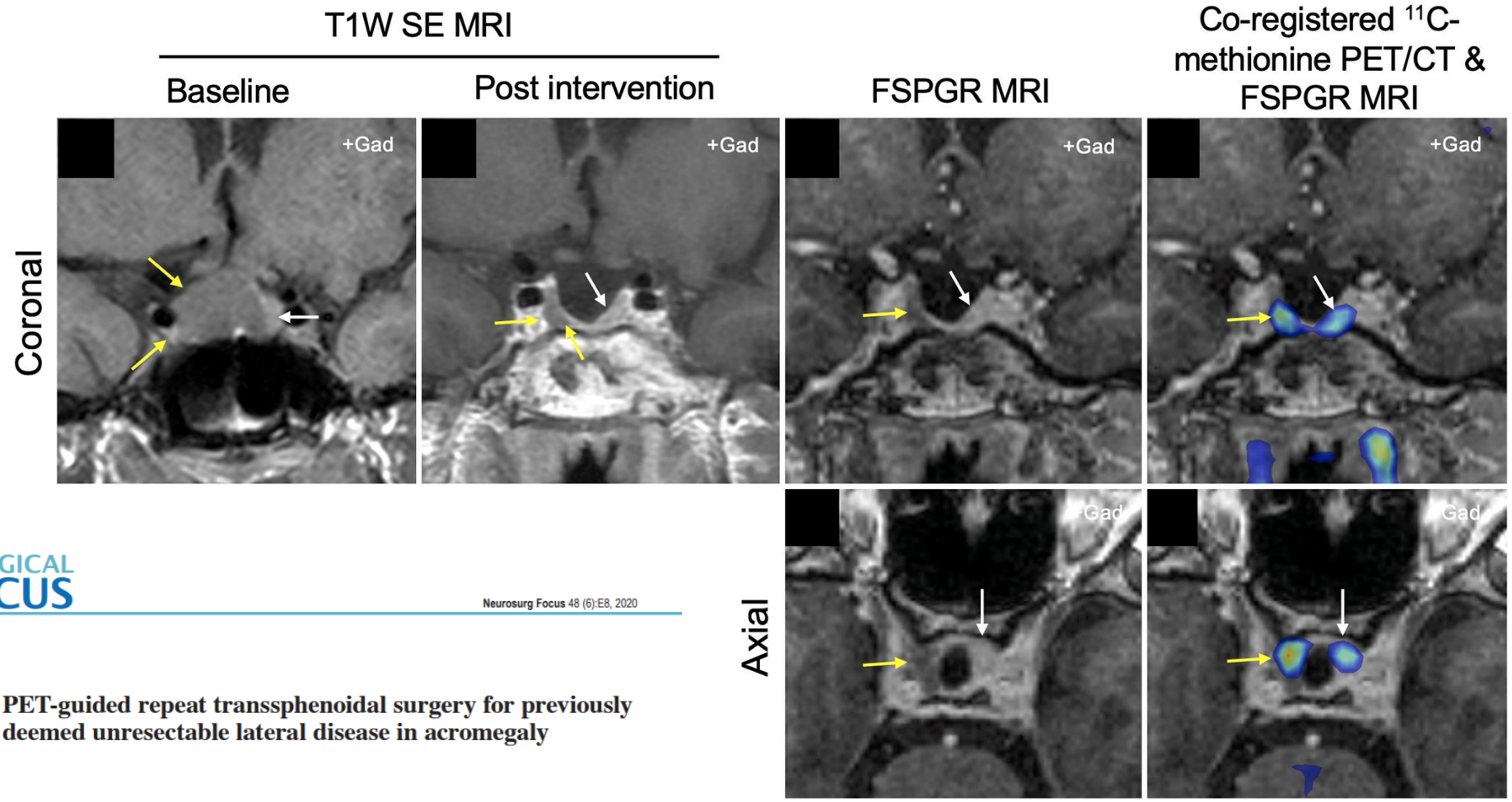
- Position of normal pituitary gland
- Position of chiasm
  - Prefixed (may preclude extended approach)
- Adenoma
  - Consistency (cystic)
  - Suprasellar extension (waist?)
  - Infrasellar extension
  - Cavernous sinus (parasellar) extension
    - Especially important in secreting tumours



From radiopaedia.org

https://radiopaedia.org/cases/38607/studies/40850?lang=gb&referrer=%2Farticles%2Fsnowman-sign-pituitary-macroadenoma-1%3Flang%3Dgb%23image_list_item_14941044

ADVANCED IMAGING (PET)



NEUROSURGICAL FOCUS

Neurosurg Focus 48 (6):E8, 2020

PET-guided repeat transsphenoidal surgery for previously deemed unresectable lateral disease in acromegaly

Bashari WA, et al. Neurosurg Focus. 2020 Jun;48(6):E8

FIVE-STEP PROCESS TO PREPARING A PATIENT FOR PITUITARY SURGERY

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- “Consenting” clinic / patient education
- Careful review of pre-operative imaging

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@ag_kolias

ak721@cam.ac.uk