Society for Endocrinology

Imperial College London

Imperial Pituitary Masterclass Meeting

Monday 16th September 2024

IMPERIAL PITUITARY MASTERCLASS MEETING 2024

Venue: Charing Cross Hospital, Imperial College Healthcare NHS Trust, London

09.00 – 09:30 Registration.

SESSION 1

CHAIRS: Dr Anjali Amin, Imperial College Healthcare NHS Trust, London.
Mr Arthur Dalton, Imperial College Healthcare NHS Trust, London.

09:30 - 10.00 *What is the role of the transitional endocrine clinic for young people with pituitary conditions transferring from paediatric to adult services?*
Dr Anna Crown, Royal Sussex County Hospital, Brighton.

10:00 - 10:20 *Elevated T3 and T4 with a normal TSH: a diagnostic conundrum*
AY Thomsen[1], D Charles[2], N Thomas[1], J Crane[1], I Bodi[1], A Al Busaidi[1]
J MacFarlane[3,4], D Gillett[4], M Gurnell[3,4], B Whitelaw[1]
[1]Kings College Hospital, London, [2]Queen Elizabeth Hospital, London,
[3]University of Cambridge, Cambridge, [4]Cambridge University Hospitals, Cambridge.

10:20 - 10:40 *Triphasic response following pituitary surgery: a case report of a rare water balance disorder.*
M Sun, B Hossain, G Simon, G Mlawa.
Barking, Havering and Redbridge University Hospitals NHS Trust, London.

10:40 - 11:00 *An interesting case of MRI-occult microprolactinoma cured by surgical resection.*
S Samarasinghe[1], K Mulla [1], J Todd[1], F Wernig[1], M Patel[1], F Ruiz[2], M Gurnell[3],
J Macfarlane[3], R Nair[1]
[1]Imperial College Healthcare NHS Trust
[2]University College London Hospitals NHS Foundation Trust
[3]Cambridge University Hospitals NHS Foundation Trust

11:00 - 11:20 *A case of pituitary macro-adenoma with suspected apoplexy.*
B Bisma, A Nilar, A Ogunko, S Urruela, M Saad, I F Abedo.
Department of Diabetes and Endocrinology, Dartford and Gravesham NHS Trust.

11:20 - 11:50 TEA & COFFEE BREAK

SESSION 2

CHAIRS: Dr Agnieszka Falinska, Royal Surrey NHS Foundation Trust, Guildford.
Mr Ramesh Nair, Imperial College Healthcare NHS Trust, London.

11:50 - 12:10 *An international conundrum.*
M Mantega[1], I Serrano[1], M Gruppetta[2], H Marcus[1],
S Baldeweg[1]
[1]University College London Hospitals NHS Foundation Trust, London, UK,
[2]Mater Dei Hospital, Msida, Malta.

12:10 - 12:30 *Recurrent Cushing's disease with unusual dermatology.*
W Geiballa[1], M Wallner[2], A Falinska[3], Z Bawlchhim[4], D Russell-Jones[1]
Royal Surrey NHS Foundation Trust, Guildford.

12:30 - 12:50 *Could this be a pituitary stalk adenoma?*
M Mort, C Sedgwick, K Muralidhara.
Kingston Hospital NHS Foundation Trust.

12:50 - 13:10 *A rare case of hypophysitis due to localised marginal zone lymphoma.*
P Agarwal[1], J Calvo Latorre[1], N Khalid[1], T Giannis[2], K Ardeshna[2], H Marcus[2], R Brenner[3], J Ostberg[1], C Kong[1].
[1]West Hertfordshire Teaching Hospitals NHS Trust.
[2]University College London NHS Foundation Trust.
[3]Royal Free London NHS Foundation Trust.

13:10 - 14:10 LUNCH

SESSION 3

CHAIRS: Dr Rebecca Scott, Chelsea and Westminster Hospital NHS Foundation Trust.
Mrs Debbie Papadopoulou, Imperial College Healthcare NHS Trust, London.

14:10 - 14.40 *Outpatient transformation in pituitary services - what and when to see?*
Dr Rupa Ahluwalia, Norfolk and Norwich University Hospitals NHS Trust

14:40 - 15:00 *An unusual cause of elevated thyroid hormones and unsuppressed TSH.*
M Phylactou[1], L Dixon[2], C Rennie[3], T Han[4], J Gaur[5], R Walls[1], N Martin[1]
[1]Department of Endocrinology, Imperial College Healthcare NHS Trust.
[2]Department of Neuroradiology, Imperial College Healthcare NHS Trust.
[3]Department of Ear, Nose and Throat Surgery, Imperial College Healthcare NHS Trust.
[4]Department of Endocrinology, Ashford and St. Peter's NHS Foundation Trust.
[5]Department of Neuropathology, UCL Queen Square Institute of Neurology.

15:00 - 15:20 *Pregnancy, prolactin and pituitary tumours.*
S Sairam, A Falinska, Z Bawlchhim, D Russell-Jones, M Wallner.
Royal Surrey NHS Foundation Trust, Guildford.

15:20 - 15:40 *Case of an empty sella syndrome; lymphocytic hypophysitis.*
L Dahal, S Sivappriyan.
Maidstone and Tunbridge Wells NHS Trust.

15:40 - 16:00 *Diagnosing and managing TSHoma in pregnancy.*
B Sharma[1], K Meeran[1], N Primrose[2], Z Van-Zuylen[2], E Hatfield[1], A Aziz[1], M Rahman[3], A Gontsarova[1], R Nair[1], N Martin[1], S Jarvis[1,2]
[1]Charing Cross Hospital, Imperial College Healthcare NHS Trust, UK.
[2] Queen Charlottes and Chelsea Hospital, Imperial College Healthcare NHS Trust, UK.
[3]North West London Hospitals NHS Trust, Northwick Park Hospital, UK.

Elevated T3 and T4 with a normal TSH: a diagnostic conundrum

AY Thomsen[1], D Charles[2], N Thomas[1], J Crane[1], I Bodi[1], A Al Busaidi[1], J MacFarlane[3,4], D Gillett[4], M Gurnell[3,4], B Whitelaw[1]
[1]Kings College Hospital, London.
[2]Queen Elizabeth Hospital, London.
[3]University of Cambridge, Cambridge.
[4]Cambridge University Hospitals, Cambridge.

Abstract
A 49-year-old man was referred from primary care with clinical features of thyrotoxicosis, including weight loss, anxiety and palpitations, over the previous four months. The patient had a 20 year history of abnormal thyroid function, characterised by elevated fT3 and fT4 with normal TSH. He had been previously assessed by the regional thyroid service 12 years prior and diagnosed with thyroid hormone resistance syndrome (RTH). This was based on clinical and biochemical assessment including TRH stimulation test, demonstrating an exaggerated response (TSH rising from 1.36 mIU/l to 14.1 mIU/l at 60 minutes) and a non-elevated alfa-subunit. Previous pituitary imaging was reported as normal. There was no family history of RTH and genetic tests failed to identify a mutation of the thyroid hormone receptor beta-gene.

Investigations
On review in clinic, he appeared euthyroid, with no goitre present. Carbimazole (30 mg) had been commenced in primary care. TFTs showed: TSH 7.06 mIU/l, fT4 17.9 pmol/l. Carbimazole was then stopped and TFTs repeated: TSH 5.21 mIU/l, fT4 27.3 pmol/l, fT3 8.5 pmol/l. Pituitary MRI showed a normal sized pituitary with a possible sub-centimetre left sided pituitary lesion.

TSHoma was suspected and the patient was given a 3 month trial of somatostatin receptor ligand (SRL).

There was improvement, but no normalisation of TFTs. SRL was initially stopped, but then recommenced, demonstrating biochemical normalisation and symptomatic improvement.

Table A- First SRL Trial

	Baseline	On treatment
TSH (mIU/l)	15.84	0.92
FT4 (pmol/l)	26.2	22
FT3 (pmol/l)	12.8	7.8

Table B- second SRL Trial

	Baseline	On treatment
TSH (mIU/l)	1.86	0.95
FT4 (pmol/l)	25.3	23.5
FT3 (pmol/l)	9.8	5.7

Methionine PET-CT was performed (off SRL) which demonstrated a skew of tracer towards the left inferior paramedian aspect of the gland. Repeat Methionine PET-CT (on SRL) showed a loss of this asymmetry, in-keeping with a small thyrotroph tumour.

Treatment
The patient proceeded to transsphenoidal surgery for resection of the presumed TSHoma. Histology confirmed TSH immune-positive pituitary adenoma. SRL was discontinued and post-operative TFTs have remained normal (TSH 1.61 mIU/l, FT4 15.7 pmol/l, FT3 4.3 pmol/l). The patient is well and has undergone a post operative TSH suppression Test. TheTSH has suppressed from 1.7 (mIL/L) to 0.02 (mIU/.L) after 10 days of liothyroinine 20 micrograms three times a day for 10 days, demonstrating resolution of the TSH-oma post following transphenoidal resection.

Conclusion
This case shows a patient, originally misdiagnosed with thyroid hormone resistance, but subsequently found to have TSH-oma 20 years later. It is unusual for a TSH-microadenoma to be resected after such a prolonged period. The case illustrates the effective use of both somatostatin receptor ligand and Methionine PET in the diagnosis of TSHoma.

Questions for discussion:

1. What clinical features could this patient have demonstrated 20 years ago that would have pointed to a diagnosis of a TSHoma rather than thyroid hormone resistance?
2. How did the use of functional imaging combined with endocrine treatment aid the diagnosis and management of this patient?

Triphasic response following pituitary surgery: a case report of a rare water balance disorder

M Sun, B Hossain, G Simon, G Mlawa.
Barking, Havering and Redbridge University Hospitals NHS Trust, London.

Introduction

Disorders of water and sodium homeostasis frequently occur following pituitary surgery, leading to increased morbidity, prolonged hospitalization, and higher readmission rates. The involvement of a multidisciplinary team is essential for optimal management of these complex cases.

Case presentation

This case report presents a 54-year-old female with a 5-month history of bitemporal hemianopia, who was diagnosed with a non-functioning pituitary adenoma and underwent microscopic transsphenoidal resection. Postoperatively, she developed hypernatremia, severe hyponatremia, and recurrent hypernatremia. The biochemical findings were indicative of a triphasic response involving arginine vasopressin deficiency (AVP-D, formerly central diabetes insipidus), the syndrome of inappropriate antidiuretic hormone secretion (SIADH), and a subsequent recurrence of AVP-D (**Figures 1 and 2**). A water deprivation test was later performed, revealing permanent AVP-D, thus necessitating long-term treatment with desmopressin.

Points for discussion:

This case report highlights a rare triphasic response following pituitary surgery. It discusses the pathophysiology of the condition, as well as its diagnosis and management. The involvement of a multidisciplinary team – including endocrinologists, surgeons, general hospital doctors and nurses – was crucial for timely intervention and effective management. The case underscores the challenges in predicting the development of AVP-D and SIADH, despite the availability of various predictive factors. The triphasic response observed in this patient emphasises the critical need for diligent postoperative monitoring of water and sodium balance in patients undergoing pituitary surgery.

Conclusion

Early recognition and management of disorders related to water and sodium homeostasis are vital to improving patient outcomes following pituitary surgery. This case highlights the importance of tailored postoperative care to prevent complications and reduce the risk of extended hospital stays and readmissions.

Figure 1. A timeline of the clinical and biochemical data, and key events

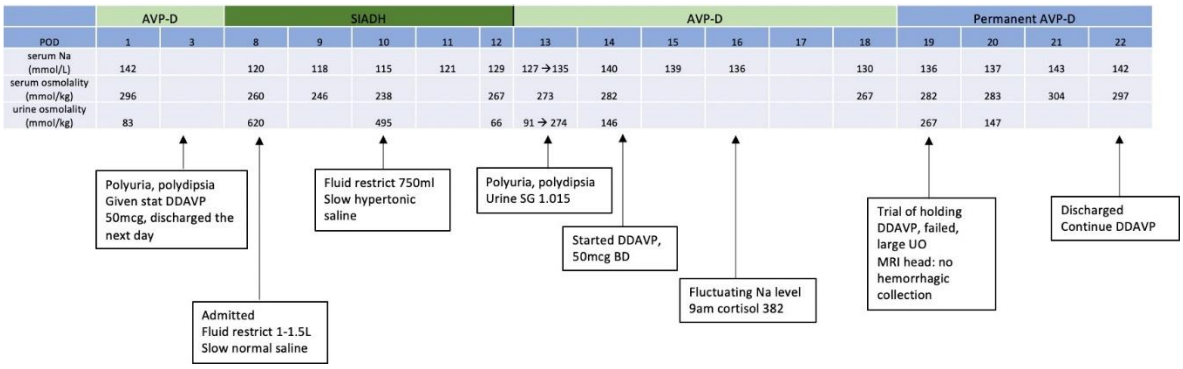
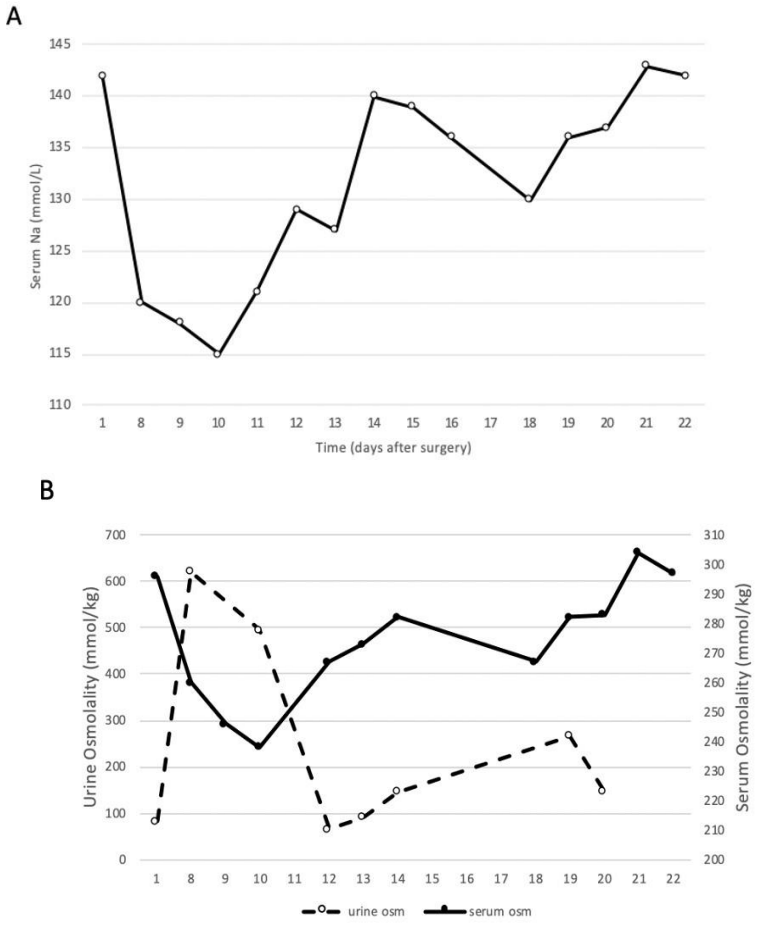


Figure 2. Graphs illustrating the biochemical findings



An interesting case of MRI-occult microprolactinoma cured by surgical resection

S Samarasinghe[1], K Mulla [1], J Todd[1], F Wernig[1], M Patel[1], F Ruiz[2], M Gurnell[3], J Macfarlane[3], R Nair[1]
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Abstract
A 31-year-old female presented to the clinic with fatigue, low libido, dyspareunia and secondary amenorrhoea. Subsequent investigations confirmed hypogonadotropic hypogonadism (luteinising hormone 2.8unit/L, follicle-stimulating hormone 4.4 unit/L, oestradiol <100pmol/L) secondary to the progesterone-only pill (stopped in May 2000) and hyperprolactinaemia (prolactin level 1084 mU/L)). Prolactin levels were confirmed on cannulated prolactin (baseline 1119 mU/L and 2-hour value 1263 mU/L).

Conventional pre- and post-contrast MRI imaging demonstrated a symmetrical gland with uniform enhancement and a midline infundibulum.

The patient was diagnosed with a microprolactinoma and started on Cabergoline 250mcg twice a week, which was then changed to bromocriptine 1.25mg daily due to dizziness. She was intolerant of both medications, had ongoing amenorrhoea and blood tests confirmed low oestrogen with a persistently elevated prolactin.

Subtle heterogeneity of signal was seen within the left pituitary gland on repeat imaging, but no definitive lesion identified. 11C-Methionine PET demonstrated a clear focus of increased tracer uptake within the left sella, in-keeping with a microprolactinoma.

The patient successfully underwent curative trans-sphenoidal surgery and repeat blood tests demonstrated normalisation of serum prolactin levels. Histology was consistent with a pituitary adenoma with a sparsely granulated, PIT1-lineage lactotroph.

This case demonstrates the additional value that Methionine PET can add for the pre-operative localisation of microprolactinomas.

Questions for discussion:

1. Should we be considering surgery as first-line treatment for patients with a macroprolactinoma?
2. In patients with a prolactinoma but no clearly defined surgical target, should we be routinely exploring other imaging modalities eg methionine PET to gain further information about the option of surgery?

A case of pituitary macro-adenoma with suspected apoplexy

B Bisma, A Nilar, A Ogunko, S Urruela, M Saad, I F Abedo.
Department of Diabetes and Endocrinology, Dartford and Gravesham NHS Trust.

Abstract
Pituitary apoplexy is a medical emergency characterised by sudden haemorrhage or infarction of the pituitary gland, typically occurring in the context of a pre-existing pituitary adenoma. This condition can lead to acute neurological and endocrine symptoms due to the rapid expansion of the tumour and subsequent compression of surrounding structures.

A 31-year-old gentleman presented to A&E with sudden onset of severe bitemporal, retro-orbital headache, photophobia, and blurred vision for two days. There was no significant past medical history. His vital signs were normal. Eye examination revealed binocular diplopia on lateral gaze, particularly on the left, and a temporal visual field defect in the left eye. His visual acuity was normal. There were no signs of meningism.

Initial suspicion was subarachnoid haemorrhage, but a CT head showed no haemorrhage, revealing instead a soft tissue lesion in the sella turcica, suggestive of a pituitary macroadenoma. Subsequent MRI pituitary confirmed a 34 mm x 22 mm x 36 mm hypointense mass within the enlarged sella turcica, compressing the optic chiasm and causing complete effacement of the sella turcica. No venous sinus thrombosis was noted on MRV.

A hormonal study revealed panhypopituitarism (cortisol: 48 nmol/L, FSH: 1.0 IU/L, LH: 0.2 IU/L, testosterone: <0.4 nmol/L, free T3: 3.8 pmol/L, free T4: 8.6 pmol/L, TSH: 0.22 mIU/L), for which hormonal replacement was initiated. Ophthalmology review confirmed optic nerve compromise with bilateral nasal optic disc margin swelling and subtle bilateral superotemporal field defects, consistent with optic chiasmal compression.

Due to the acute presentation of headache and visual defects, pituitary apoplexy was suspected. The patient underwent trans-sphenoidal resection of the adenoma. Histopathology confirmed a necrotic non-functioning gonadotroph pituitary adenoma. Postoperatively, his vision improved, and he was discharged on levothyroxine, hydrocortisone, and testosterone replacement
.
He was followed up in endocrine clinic after four months. He was clinically well and was commenced on growth hormone replacement. He expressed his wishes to start family. We have referred him for assisted reproduction.

This case highlights the importance of considering pituitary apoplexy in patients presenting with acute headache and visual disturbances. Timely imaging and surgical intervention are critical for managing this condition. The patient’s postoperative recovery was favourable, and ongoing hormone replacement therapy, along with assisted reproductive support, addressed his long-term health and reproductive needs.

Questions for discussion:

1. Was it appropriate to refer the patient for emergency pituitary surgery at presentation? Would you do things differently?
2. How often do patients presenting with headaches end up being diagnosed with pituitary adenoma/apoplexy during unselected acute medical take?

An international conundrum

M Mantega[1], I Serrano[1], M Gruppetta[2], H Marcus[1], S Baldeweg[1]
[1]University College London Hospitals NHS Foundation Trust, London, UK.
[2]Mater Dei Hospital, Msida, Malta.

Abstract
In August 2023 a 26-years-old man was referred to UCLH from Malta, where he presented locally with lethargy and food cravings.

He gave no history of acne or proximal muscle weakness.

His past medical history included OSA, hypertension, T2DM, diagnosed 2-3 years ago with worsening control. His weight increased from 94 to 104 kg and his BMI was 39 kg/m^2.

His medications included: empaglifozin, Trulicity, duloxetine, perindopril, doxazosin, Lantus (30 units daily), atorvastatin.

When first examined on 15/12/22, he appeared cushingoid with abdominal striae and his BP was 133/83 mmHg.

Initial investigations included: 9AM cortisol 1021 nmol/L (145.4 - 619.4), cortisol after ONDST 746, 331 nmol/L (< 50) (in two different occasions), 24h-UFC 1068, 869 nmol/L/24h (57.7 - 806.8) (in two different occasions), ACTH 42 ng/L (10 - 48), LDDST showed a cortisol of 233 nmol/L (< 50), HbA1c was 79 mmol/mol = 9.4% (4.7 - 6.4%) the rest of the pituitary, renal and liver profiles were within the normal limits.

MR Pituitary (16/4/2023) showed a 5x3mm hypointense nodule, in keeping with a pituitary microadenoma.

After pituitary MDT discussion, IPSS with CRH was performed, showing a peak ACTH of 217 ng/L (7.2-63.3) at 15 minutes from the right IPS, with a maximum IPS:P ratio of 1.69 (left IPS to peripheral), with no evidence of a central source.

Time min	P ACTH (7.2 - 63.3 ng/L)	LIPS ACTH (7.2 - 63.3 ng/L)	RIPS ACTH (7.2 - 63.3 ng/L)	LIPS:RIPS	LIPS:P	RIPS:P
0	32.8	36.8	20.2	1.82	**1.12**	0.62
3	75	127	122	1.04	**1.69**	1.67
8	126	184	179	1.03	1.46	1.42
15	175	210	**217**	0.97	1.2	1.24

He was discussed again in our pituitary MDT and a Ga68-DOTATATE PET-CT was performed, showing a 1 cm nodule at the body of the left adrenal gland and a 1.2 cm nodule at the lateral limb of the right adrenal gland. These were not clearly tracer avid and no other lesions were identified in small bowel, pancreas or lungs. On CT CAP these lesions appeared benign (HU -3) and our adrenal MDT decided that no further imaging was needed for these adrenal nodules.

Following further discussion in our pituitary MDT and since he developed severe proximal myopathy, transsphenoidal surgery was performed on 24/11/23 and the suspected microadenoma was seen immediately and removed.

Histology showed normal anterior pituitary gland with no evidence of adenoma.

Cortisol level post-operatively was 367 nmol/L and 660 nmol/L (133 - 537) on day-1 and day-2, respectively.

On 29/11/23 his cortisol was 287 nmol/L and ONDST was performed in two different days, showing a cortisol of 147 nmol/L and 255 nmol/L.

He was discharged on hydrocortisone 10/5 mg as his cortisol on post-op ONDST's, albeit not suppressed, was less elevated than his previous ones and also because his post-op MRI showed that the discrete lesion seen on previous imaging was no longer conspicuous.

He was reviewed in his local hospital two months after his transsphenoidal surgery and he was feeling more energetic, he lost 5 kg, and his food cravings were improving. His local team was planning to stop his hydrocortisone and repeat an ONDST.

In conclusion, this 26 y/o gentleman with hypertension and T2DM had both clinical and biochemical evidence of hypercortisolaemia with a pituitary microadenoma. However, his IPSS was equivocal, and his histology was negative. He also had small bilateral adrenal nodules. His symptoms improved after transsphenoidal surgery.

Questions for discussion:

1. Do you suggest any further investigations?
2. What treatment options do you recommend moving forward?
3. What investigations do you suggest if his symptoms reoccur?

Recurrent Cushing’s disease with unusual dermatology

W Geiballa, M Wallner, A Falinska, Z Bawlchhim, D Russell-Jones.
Royal Surrey NHS Foundation Trust, Guildford.

Abstract
A 31-year-old woman presented with classical clinical features of Cushing's syndrome, including weight gain predominantly around the face, a buffalo hump, abdominal striae, proximal myopathy, supraclavicular fat pads, and skin chemosis. She also had an unusual anal and perianal ulcerating lesion for which she was under dermatology. Dynamic pituitary MRI revealed a small hypo enhancing lesion (5 mm) on the left side, consistent with a pituitary microadenoma, and her endocrine biochemistry was in keeping with ACTH dependent Cushing’s disease.

She had a transsphenoidal hypophysectomy in March 2021. Postoperatively, she was discharged on prednisolone 5 mg daily. She was found to be a fast metaboliser of prednisolone and needed higher maintenance doses, but after changing to hydrocortisone, this was gradually able to be weaned off. She was feeling well and lost a significant amount of weight.

In December 2022, she experienced a recurrence of her Cushing symptoms, including a recurrence of the anal dysplastic ulceration, which was smear positive for human papilloma virus (HPV). The dermatology opinion was that this developed as a result of immunosuppression secondary to Cushing. Her biochemistry was mixed, with an overnight dexamethasone suppression test cortisol of 109nmol/L, but with a normal urinary free cortisol, and borderline midnight salivary cortisol. Her MRI scan raised the possibility of a residual adenoma in the surgical pituitary bed. Due to the difficulty in locating a surgical target a methionine PET CT scan was performed which did show tracer uptake along the inferior-lateral right wall of the pituitary fossa.

After being reinstated on metyrapone, she had a further transsphenoidal hypophysectomy in May 2024. She is currently in biochemical remission.

Questions for discussion:

1. Consideration of dermatological presentation of Cushing’s disease, including tumours due to immunosuppression

Could this be a pituitary stalk adenoma?

M Mort, C Sedgwick, K Muralidhara.
Kingston Hospital NHS Foundation Trust.

Case History
A 27-year-old Caucasian man presented with a several-month history of tiredness and low libido, intermittent mild frontal headache, bilateral gynaecomastia, and difficulty losing weight (BMI 37). He had no visual symptoms, no loss of smell, no polyuria, and no history of diabetes or hypertension. There was no significant past medical history apart from meningitis at age 14, nor any significant medical conditions in his family. He was a non-smoker, consumed alcohol socially, and used recreational drugs occasionally. He was not on any regular medication. A few years ago, he had used anabolic steroids over a 6-month period. His partner had an ectopic pregnancy a year ago, and they were keen to start planning again.

Investigations
Testosterone 2.2 nmol/L, SHBG 19 nmol/L, Albumin 42 g/L, Prolactin 437 mIU/L, LH <1.0 IU/L, FSH 1.9 IU/L, cortisol 482 nmol/L, Free T4 14.6 pmol/L, TSH 1.2 mIU/L, IGF-1 13 nmol/L. Na 141 mmol/L, potassium 4.2 mmol/L, creatinine 110 micromol/L, eGFR 79 ml/min/1.73m2, ALT 36 U/L, HbA1c 38, Hb 116, ferritin 297 microgram/L.

His visual fields were normal on Humphrey's perimetry and optical coherence tomography (OCT) was normal too.

His MRI pituitary revealed a well-defined homogeneously enhancing mass measuring 20 mm x 19mm x 19mm in the suprasellar cistern, displacing the chiasm upwards and deviating the pituitary stalk to the right. The differentials offered were a glial tumour, hamartoma, or a pituitary stalk adenoma. The images were discussed in the MDT, which recommended a CT head and MRI head, but these did not add to the differential diagnoses. Given normal visual assessment and OCT, and the risk of inducing multiple pituitary dysfunctions due to biopsy or surgery, the MDT recommended surveillance with repeat imaging in 3 months.

He is currently considering his options for fertility-preserving gonadal replacement and has started Tirzepatide for weight management.

Conclusion and points for discussion:
This young man presents with hypogonadotrophic hypogonadism due to an unusual suprasellar tumour, which has raised diagnostic challenges owing to its location and appearance. Although a pituitary stalk adenoma remains a possibility, it is perhaps very difficult to get closer to the diagnosis without invasive diagnostic or therapeutic intervention.

A rare case of hypophysitis due to localised marginal zone lymphoma

P Agarwal[1], J Calvo Latorre[1], N Khalid[1], T Giannis[2], K Ardeshna[2], H Marcus[2], R Brenner[3], J Ostberg[1], C Kong[1].
[1]West Hertfordshire Teaching Hospitals NHS Trust.
[2]University College London NHS Foundation Trust.
[3]Royal Free London NHS Foundation Trust.

Introduction
Lymphomas involving the pituitary gland and skull base are exceedingly rare, often posing a diagnostic challenge due to their ability to mimic other sellar/parasellar lesions.

We present a unique case of marginal zone lymphoma initially masquerading as hypophysitis, highlighting the importance of maintaining a broad differential diagnosis and the role of timely tissue diagnosis.

Case Presentation
A 67-year-old female with a previous history of lumpectomy for a low-grade breast cancer presented with a 3-month history of worsening occipital headaches, vomiting, and cranial neuropathies, including tongue weakness, hearing loss, and new-onset polydipsia and polyuria. Initial imaging revealed a sellar/suprasellar mass involving the pituitary gland and stalk with extension into the skull base. The radiologic appearance and biochemical profile were suggestive of hypophysitis, with associated panhypopituitarism and cranial diabetes insipidus. She was started on desmopressin, levothyroxine and hydrocortisone.

Despite treatment with hormone replacements, the patient's symptoms progressed, with the development of facial palsy, ptosis, dysphagia, and dysphonia. Repeat imaging demonstrated an interval increase in the size of the enhancing sellar component. She was urgently referred to neurology and neurosurgery and discussed at the pituitary MDT. A CT scan of the chest, abdomen, and pelvis revealed a 4mm right lung nodule but no other evidence of abnormal lymphadenopathy or other malignancy. She then proceeded to have a PET CT scan, which showed increased uptake in the skull base and pituitary fossa, with some tonsillar fullness. ENT reviewed endoscopically and advised that the tonsils appeared normal. An urgent skull biopsy was pursued, which unexpectedly revealed findings consistent with a B-cell lymphoproliferative disorder, likely marginal zone lymphoma.

The patient was promptly referred to Haematology and, meanwhile, initiated on high-dose dexamethasone (later switched to hydrocortisone), leading to significant clinical improvement in her neurological symptoms. She was discussed at the lymphoma MDT and started on chemotherapy for her lymphoma, with subsequent improvement in her diabetes insipidus symptoms and gradual tapering of her hydrocortisone dosage.

Points for discussion:
This case underlines the importance of maintaining a broad differential diagnosis for sellar/parasellar lesions, as lymphomas can rarely involve this region and mimic more common pathologies like hypophysitis. Early tissue diagnosis is crucial to guide appropriate treatment, as therapies for lymphoma differ vastly from those for other sellar lesions.

While hypophysitis remains the most common cause of pituitary inflammation, our case highlights that lymphomas should be considered, particularly in cases with atypical clinical or radiologic progression. A multidisciplinary approach involving neurology, neurosurgery, endocrinology, and haematology/oncology is vital for optimal diagnosis and management.

An unusual cause of elevated thyroid hormones and unsuppressed TSH.

M Phylactou[1], L Dixon[2], C Rennie[3], T Han[4], J Gaur[5], R Walls[1], N Martin[1]
[1]Department of Endocrinology, Imperial College Healthcare NHS Trust.
[2]Department of Neuroradiology, Imperial College Healthcare NHS Trust.
[3]Department of Ear, Nose and Throat Surgery, Imperial College Healthcare NHS Trust.
[4]Department of Endocrinology, Ashford and St. Peter's NHS Foundation Trust.
[5]Department of Neuropathology, UCL Queen Square Institute of Neurology.

Abstract
A 31-year-old man was referred with a two-year history of persistently raised Thyroid Stimulating Hormone (TSH) (ranged from 4.62 to 9.0 mU/L (reference range (RR) 0.3-4.2)) in the context of raised free T3 (fT3) (ranged from 8.8 to 15.4 pmol/L (RR 2.4- 6.0)) and free T4 (fT4) concentrations (ranged from 21.1 to 36.7 pmol/L (RR 9.0-23.0)). These were measured as part of a diagnostic work-up for diarrhoea. He did not report any other symptoms of hyperthyroidism.

Similar thyroid function tests were confirmed using several different assay platforms. Anterior pituitary panel testing also showed a raised Follicle Stimulating Hormone (FSH) level of 17.3 IU/L (RR 1.7 – 8.0) but normal testosterone. Alpha subunit (ASU) was elevated at 3.26 IU/L (RR<1.0), however SHBG was normal (47.3 nmol/L, RR 14.6-94.6). A pituitary MRI with contrast and a subsequent dynamic MRI did not reveal a pituitary lesion.

A Thyrotropin Releasing Hormone (TRH) stimulation test showed a rise in TSH (T=0min: 6.9 mU/L, T=20 min: 12.9 mU/L and T=60 min 16 mU/L), thus making a diagnosis of a TSH-oma unlikely. Genetic analysis of the thyroid hormone receptor beta (b) gene did not detect any pathogenic variants.

The patient was managed as a presumed case of resistance to thyroid hormone b (RTH b) since genetic analysis is negative in about 10% of patients. During follow-up, he reported palpitations and an ECG confirmed tachycardia. He started low dose carbimazole (10mg) but did not tolerate this and was switched to propranolol.

Follow-up pituitary MRI once again showed a normal pituitary gland but also identified a well-defined, enhancing mass in the floor of the sphenoid sinus projecting into the nasopharynx that had grown in size compared to previous MRIs. This raised the possibility of an ectopic pituitary adenoma.

In view of this, an octreotide suppression test was performed showing a fall in TSH, fT4, fT3 and FSH. ENT examination confirmed the presence of a lesion bulging through the floor of the sphenoid sinus. The patient underwent endoscopic resection of the lesion, and the histology confirmed the presence of a plurihormonal pituitary adenoma (PitNET) with positive staining for TSH, growth hormone (GH), FSH, luteinising hormone (LH) and prolactin on immunohistochemistry. Within eight days, TSH fell to an undetectable concentration, associated with a low normal fT4 (TSH <0.01 mU/L, fT4 9.9 pmol/L). Thyroid function spontaneously recovered within a few weeks. Interestingly, his serum FSH also normalised following the removal of the nasopharyngeal lesion.

Questions and points for discussion:

1. The patient's response to TRH stimulation was not in keeping with a TSH-secreting tissue. Do ectopic TSH-secreting pituitary tumours respond to TRH stimulation differently to TSH-omas within the pituitary fossa?
2. The α-GSU:TSH molar ratio can be used in the biochemical distinction between TSHoma and RTHb. However, an elevated FSH, as was the case with this patient, invalidates the calculation of this ratio.
3. The nasopharynx and sphenoid sinus are important review areas for ectopic pituitary tissue. They can represent an imaging 'blind spot' as the paranasal sinuses often contain distracting and obscuring mucosal oedema.

Pregnancy, prolactin and pituitary tumours

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Abstract
This case describes the clinical history of a 29-year-old Caucasian woman who presented with peripheral blurring of vision and mild frontal headache in the 30th week of pregnancy (G2P1).

Further history revealed similar symptoms at the end of her last pregnancy, which was within the last year. Visual field testing confirmed reduced visual acuity and bitemporal hemianopia. MRI of the pituitary confirmed pituitary enlargement with compression of the optic chiasm.

Bloods showed evidence of mild TSH suppression (TSH 0.4 mIU/L [0.35-4.94], T4 6.7 pmol/L [9-19.1]) and raised prolactin (3295 mIU/L [109-557], macroprolactin recovery 79%). Pituitary function tests were otherwise normal.

Weekly ophthalmology review showed rapid deterioration of visual fields and colour vision.

Multidisciplinary team (MDT) meeting discussions focussed on appropriate treatment options, balancing patient expectations of breastfeeding with safe management of the pituitary tumour and progressing the pregnancy for as long as possible.

Cabergoline was commenced during pregnancy, to promote normal lactotroph shrinking. Following a C-section delivery at 33+3/40, visual fields and acuity returned to normal.

This case highlights the importance of MDT discussions in the care of complex pituitary patients. It particularly highlights the sensitive discussions and considerations that need to be taken when commencing Cabergoline during pregnancy or breastfeeding, and the role that pregnancy plays in pituitary enlargement.

Question for discussion:

1. How does pregnancy affect pituitary adenomas?
2. What are the considerations for dopamine agonist use in pregnancy?

Case of an empty sella syndrome; lymphocytic hypophysitis

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Introduction
Lymphocytic hypophysitis is an endocrine disorder characterised by autoimmune inflammation of the pituitary gland with varying degrees of pituitary dysfunction. It can rarely be diagnosed in women during third trimester or postpartum.

Case Description
A 39-year-old, normally fit lady, BMI 28.6kg/m2, presented to us 13 months postpartum after an uncomplicated second pregnancy. She reported polydipsia and polyuria (about 10 litres), worsening since peripartum.

Initial investigation of the pituitary hormones showed borderline low free thyroxine of 11.5 pmol/L and TSH of 1.4 mU/L. Her thyroid TPO antibody was <9.0 IU/ml. The rest of her 9am pituitary function test was normal as detailed below. Her serum sodium was 153 mmol/L, serum osmolality 310mOSM/kg and urine osmolality 129mOSm/kg after overnight fasting. These results prompted further dynamic testing for Diabetes Insipidus (DI). Her HbA1c was normal at 33 mmol/mol.

During standard water deprivation test she had a good response to DDAVP confirming the diagnosis of cranial DI. She was commenced on oral desmopressin replacement.

She continued to feel unwell with symptoms including tiredness in the months that followed. Her 9 am pituitary function test was repeated. This showed ongoing persistent borderline low T4 and additionally, worsening cortisol from normal at 477 nmol/l previously to low at 86nmol/L.

Subsequently, further dynamic function testing to investigate low cortisol was done and thyroid function tests were also repeated. Repeat thyroid function was normal. Both Short Synacthen Test (SST) and Insulin Tolerance Test (ITT) revealed adequate cortisol response (results below).

Her growth hormone level response to ITT, however, was suboptimal with peak growth hormone of 4.7mcg/L. This raised questions about whether replacement should be started for growth hormone insufficiency.

Two MRI scans within 2-year interval showed absent bright spot with stable partial empty sella appearances.

Overall, clinical and radiological diagnosis was that of partial hypopituitarism likely related to a case of Lymphocytic Hypophysitis. She is under surveillance in our Endocrine clinic.

Conclusion
Patients with endocrine disorders can present non-specifically during postpartum, especially with autoimmune aetiologies. Careful endocrine assessment with multi-disciplinary involvement is key for diagnosis and appropriate management.

Questions for discussion:

1. How frequently should patients be monitored and how long should the patient be followed up for future deficiencies?
2. How should one decide replacements if the hormone levels are at the lower end of normal range?
3. Would you start this patient on GH replacement given the suboptimal GH response to ITT, what additional factors/tests would you consider?
4. Any other investigations that could have helped the diagnosis early or any suggestions on alternative management?

Diagnosing and managing TSHoma in pregnancy

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Abstract
A 26-year-old female was referred for discordant thyroid function tests which were measured for tiredness: fT4 24.5 pmol/L(reference range 9-23 pmol/L), fT3 17.9 pmol/L (reference range 2.4-6.0 pmol/L), TSH 15.7 mIU/L (reference range 0.3-4.20 mIU/L). She had a longstanding history of palpitations, fatigue and had regular periods. On examination, there was a nodular, mobile thyroid goitre with no features of thyroid eye disease. An initial pituitary blood profile was completed with a serum prolactin 617 mIU/L (reference range 102-496 mIU/L) and thyroid ultrasound confirmed the goitre. Before completing investigations, the patient had an unplanned pregnancy and was referred to the Obstetric Medicine service at 16 weeks' gestation with the discordant thyroid function tests. Thyroid biochemistry was undertaken using two assays (Coulter-Beckman and Abbott based platforms) to exclude thyroid interference. An MRI Pituitary was performed at 18 weeks' gestation and a hyper intense pituitary macro adenoma with suprasellar and right cavernous sinus extension elevating the optic chiasm identified. Visual fields revealed a left superior visual field loss (with left nerve fibre thinning on left OCT).

The case was discussed at the Pituitary MDT (attended by Endocrinologists, Neurosurgeons, Obstetric Physician, Obstetrician, Obstetric Anaesthetist, Ophthalmologist). The most likely diagnosis was a TSH secreting pituitary macroadenoma and concerns raised around potential pituitary enlargement from physiological lactotroph hyperplasia with advancing gestation. Conservative management was agreed with monthly Octreotide and Cabergoline for lactotroph suppression. Literature review revealed a small number of cases of somatostatin analogue (SSA) use in pregnancy; potential risks including endocrine effects and intrauterine growth restriction. The patient was counselled about these medications with input from the lead maternal pharmacist.

After starting treatment, thyroid function normalised, prolactin fell from 878 IU/l to 356 IU/L and biochemistry was monitored throughout pregnancy. Weekly monitoring of visual fields was organised with regular fetal growth scans. She underwent an oral glucose tolerance test which confirmed diabetes at 24 weeks gestation (likely gestational +/- SSA related), commenced on insulin with Freestyle Libre for glucose monitoring. Regular assessment in the Obstetric Medicine clinic, visual fields and a repeat MRI pituitary (32 weeks gestation) confirmed a stable clinical course with ongoing pituitary MDT involvement. Cabergoline was discontinued at 32 weeks gestation to allow for breastfeeding with close monitoring of visual fields.

At term, she was booked for an induction of labour and delivered a live infant at 38+5 weeks gestation by vaginal delivery. Timing of surgery will depend on her post -partum progress with close review by the Endocrinology and Neurosurgical teams planned. She has been advised on contraception and requires pre-pregnancy counselling after definitive surgical treatment.

Questions for discussion:

1. Did she need any medical therapy, or could this have been managed with just visual fields?
2. What are the challenges for diagnosis of TSHoma in pregnancy?