# Hammersmith Abstracts

**Friday 7th December 2018**

13th Hammersmith Multidisciplinary Endocrine Symposium 2018

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# Hammersmith Hospital 13th Multidisciplinary Endocrine Symposium
# Provisional programme Fri 7th Dec 2018

## Wolfson Conference Centre, Hammersmith Hospital, London

8.30am Registration & Coffee

8.55am Welcome and Introduction
**(Fausto Palazzo, Karim Meeran & Waljit Dhillo)**

**Session 1: Genetics and Endocrine disease (Chair James Ahlquist)**

9.00am Phaeochromocytoma – Which genetic tests & why?
**Dr Scott Akker – (St Bartholomew's Hospital**)

9.30am When to do genetics in Primary HPT?
**Prof Jeremy Turner (Norfolk & Norwich Hospital)**

10.00am Clinical case: **Y013 (OC1)**: Phaeochromocytoma Crisis: Adrenal Incidentaloma with Contralateral Renal Infarction and beta blockade administration

**10.15am Coffee Break**

**Session 2: Metabolic Medicine & Surgery (Chair Prof Tricia Tan)**

10.45am Clinical case**: Y002 (OC2):** Flash glucose monitoring for diagnosis and management of post bariatric hypoglycaemia.

11.00am Obesity Surgery vs Medical Treatment: Who gets what and what is to come?
**Prof Sir Stephen Bloom (Imperial College)**

11.30am Obesity surgery: the surgical options, technique and morbidity
**Mr Ahmed Ahmed (St Mary's Hospital, London)**

11.50am The role of T3 in The hypothyroid patient
**Prof Colin Dayan (Cardiff University)**

**12.20pm Lunch & Poster session**

**Session 3: Personalised Endocrine Medicine & Surgery (Chair Mr Fausto Palazzo)**

1.20pm **Hammersmith International Guest Lecture:** Endocrine Surgery in 2018: Precision Medicine **Prof Frederic Sebag (Marseille, France)**

2.00pm How to avoid morbidity in Endocrine Surgery **Mr David Scott Coombes, Cardiff**

2.20pm Clinical Cases

2.20pm **Y003 (OC3):** When not to ignore the normal results in endocrinology

2.30pm **Y015 (OC4):** False positive diagnosis of a paraganglioma of the organ of Zuckerkandl

2.40pm **Y020 (OC5)**: The Challenge of a Great mimic: Case report of Pheochromocytoma presenting as Acute Coronary Syndrome complicated by Retroperitoneal bleed and Multisystem Crisis

**2.50pm Coffee break**

**Session 4: Endocrinology & Pregnancy revisited (Chair Dr Jeannie Todd)**

3.10pm Thyroid hormone supplementation in pregnancy **Dr Sheba Jarvis**

3.30pm Hyperparathyroidism & Pregnancy **Mr Fausto Palazzo (Hammersmith Hospital)**

3.50pm Clinical cases **(Chair James Ahlquist)**

3.50pm **Y001 (OC6)**: Hypercalcemia in pregnancy in a patient with multiple previous miscarriages

4.05pm **Y016 (OC7)**: Case Report: Recurrent primary hyperparathyroidism during pregnancy in MEN4

4.20pm: **Y010 (OC8)**: Don't miss neonatal thyrotoxicosis - the importance of assessing an at risk baby at 7 days

4.35pm Close and Feedback

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|---|---|
| Y001 OC6 | Hypercalcemia in pregnancy in a patient with multiple previous miscarriages |
| Y002 OC2 | Flash glucose monitoring for diagnosis and management of post bariatric hypoglycaemia |
| Y003 OC3 | When not to ignore the normal results in endocrinology |
| Y004 | Hyponatraemia secondary to the deficiency of adrenocorticotropic hormone |
| Y005 | Acromegaly with Non-PTH related Hypercalcemia |
| Y006 | Late presentation of a GLUD-1 activating mutation: consider this rare genetic cause in adults with fasting and protein-sensitive hyperinsulinaemic hypoglycaemia |
| Y007 | HCG and diet: The ultimate way of fat burning |
| Y008 | Severe triglyceridaemia in PPAR-gamma mutations: uncommon cause often overlooked |
| Y009 | Hemi-ballismus as a presentation of hyperglycaemia and the classical neuro-imaging findings |
| Y010 OC8 | Don't miss neonatal thyrotoxicosis - the importance of assessing an at risk baby at 7 days |
| Y011 | A case of ‘non-classic’ Non-Classic Congenital Adrenal Hyperplasia |
| Y012 | The Natural History of Silent Corticotroph Adenomas: A Tertiary Referral Centre Experience |
| Y013 OC1 | Phaeochromocytoma Crisis: Adrenal Incidentaloma with Contralateral Renal Infarction and beta blockade administration |
| Y014 | A masquerading parathyroid carcinoma |

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| Y015 OC4 | False positive diagnosis of a paraganglioma of the organ of Zuckerkandl |
| Y016 OC7 | Case Report: Recurrent primary hyperparathyroidism during pregnancy in MEN4 |
| Y017 | Screening for Graves' Orbitopathy in Endocrinology Clinic: A multi-disciplinary perspective |
| Y018 | To treat or not to treat: An interesting case of alemtuzumab-induced thyroid disorder |
| Y019 | Gynaecomastia - an Endocrinological or a Surgical problem? |
| Y020 OC5 | The Challenge of a Great mimic: Case report of Pheochromocytoma presenting as Acute Coronary Syndrome complicated by Retroperitoneal bleed and Multisystem Crisis |
| Y021 | Water-clear cell Parathyroid adenoma: rare case report |
| Y022 | Real-world use of non-echoplanar diffusion weighted MRI imaging for detection and clinical decision-making in Graves' orbitopathy |

**Y001**

## Hypercalcemia in pregnancy in a patient with multiple previous miscarriages

Rabia Arfan, Alireza Mohammadi, Sriranganath Akavarapu, Wexham Park hospital, Frimley Health NHS Trust.

Hypercalcaemia during pregnancy is not very common and can result in foetal morbidity and miscarriages. If it is due to primary hyperparathyroidism, guidelines suggest parathyroidectomy if corrected calcium is above 2.75 mmol/L which is considerably lower than usual cut off of 3 mmol/L in non-pregnant patients. If surgery is needed the best time is the second trimester as general anaesthesia is safer. When a pregnant patient is diagnosed with hypercalcaemia every effort should be made to get the correct diagnosis as quickly as possible and plan the management properly.

A 36-years old, 14 weeks pregnant woman was referred to the endocrinology department urgently with a corrected calcium of 2.97 mmol/L and normal parathyroid hormone (PTH). Her symptoms were urinary frequency and nausea. She had three previous miscarriages (2002- 10 weeks, 2007 – 6 weeks, 2017 – 6 weeks) and two normal births (2004 and 2008).

Blood test showed high corrected calcium level at least since 2011 (2.64 – 2.97 mmol/l) with normal PTH (3.2 – 5.2 pmol/l) and low phosphate (0.66-0.93 mmol/l). Her vitamin D levels were 70.3- 73.7 nmol/L). Her renal function and electrolytes including Mg were normal. Her urinary calcium was 1.24mmol/l in 24 hours but as urine volume was less than a litre the test was repeated.

She was regularly taking folic acid 400mcg and vitamin D 400 units once a day. Her father had ischaemic heart disease and type 2 diabetes, Mother had Crohn's and B12 deficiency. Two sisters had B12 deficiency. Father, mother, mother's sister, two sisters and one of her children had calcium level checked at some point and they were normal. The patient has been with a new partner and was extremely worried about another miscarriage.

At that time the main differential diagnoses were Primary hyperparathyroidism (hypercalcaemia with inappropriately normal PTH) which needed parathyroidectomy in 2$^{nd}$ trimester and Familial Hypocalciuric Hypercalcaemia FHH (due to low urinary calcium with normal Vitamin D level) which could be monitored closely.

We repeated the tests and 24 hr Urinary calcium showed low calcium output again with Urinary Calcium Creatinine Clearance Ratio of 0.0044 which was in favour of Familial Hypocalciuric Hypercalcemia but on other hand all close family members had normal calcium which made it difficult to diagnose without further investigation. She had her genetic screening for FHH and her case was discussed with genetic lab to prioritise her test and get results in 1-2 weeks (usually it takes 8 weeks). When

discussed with nuclear medicine team at Oxford, they advised not to do SESTAMIBI scan or CT scan in pregnancy rather consider MRI scan. Opinion was sought from the endocrinologists at Hammersmith Hospital about starting her on cinacalcet in order to reduce hypercalcemia related risk in pregnancy and decision was made not to give it as there was no outcome study on its effect in pregnancy and wait for the other investigations. She was seen by ENT colleagues (both at Wexham park Slough and John Radcliffe Oxford), Obstetrician and obstetric anaesthetist so she could have timely parathyroidectomy in case of negative genetic tests.

Her genetic screening showed heterozygous positive result for CASR on which basis she was given a diagnosis of FHH type 1 with mild hypercalcemia. She was monitored during rest of her pregnancy which remained uneventful except 2 episodes of constipation which needed admission and was treated by starting her on regular laxatives. She delivered normally in May 2018 and her daughter's calcium levels post birth remained normal at 2.44 mmol/L.

The patient was continually involved in decision making throughout the management of her hypercalcemia in pregnancy.

This is an example of a complex endocrine case and highlighted the importance of good communication between various specialities within the hospital and also across different hospitals to ensure safe and successful outcome.

**Y002**

## Flash glucose monitoring for diagnosis and management of post bariatric hypoglycaemia

Carolina B. Lobato[1]; Marta Guimarães[1,2]; Sofia S. Pereira[1]; Tiago Morais[1]; Mário Nora[1,2]; Mariana P. Monteiro[1].

[1] Endocrine, Cardiovascular & Metabolic Research, Unit for Multidisciplinary Research in Biomedicine (UMIB), University of Porto, Porto, Portugal.

[2] Department of General Surgery, Centro Hospitalar de Entre o Douro e Vouga, Santa Maria da Feira, Portugal.

**Background:** Post-bariatric hypoglycaemia (PBH) is a rare yet emerging clinical condition that lacks well-established diagnostic criteria or management guidelines. Our aim was to unravel the potential of using flash glucose monitoring in the clinical assessment and management of patients with presumed PBH, based on the preliminary results of its implementation at our bariatric centre.

**Methods:** Two patients (A and B) submitted to Roux-en-Y gastric bypass (RYGB) (A: 4.8; B: 4.0 years earlier) presented with presumed PBH. After a comprehensive workout to rule out other causes for hypoglycaemia, patients underwent flash glucose monitoring for fourteen days coupled with simultaneous symptoms and meal diary record. Targeted data analysis was then performed to retrieve objective measures of patients' glucose profiles (namely median and interquartile range, mean absolute glucose change [MAG change] and low blood glucose index [LBGI]).

**Results:** Both patients presented a marked glucose variability (MAG change: A: 2.7; B: 3.0), with greater glucose excursions towards both hyper- and hypoglycaemia ranges leading to recurrent low glucose events. Moreover, despite this pattern was accentuated on weekend days, a reduction in the risk of low glucose (LBGI: A: 2.3; B: 5.2) along the evaluation period was noticeable.

**Conclusions: F**lash glucose monitoring data targeted analysis along with food and symptoms diary records allows to retrieve objective and clinically relevant data in patients with presumed PBH. Our protocol stands out as a simple and easily accessible diagnostic tool not only to evaluate the magnitude of the condition but also to enable patient empowerment by raising self-awareness over behaviours triggering glucose fluctuations towards improved PBH management.

**Y003**

## When not to ignore the normal results in endocrinology

Rafia Latif (FY1), Avinash Nanayakkara (CT1), Kasi Subbiah (ST3), Siva Sivappriyan (Consultant Endocrinologist & Diabetologist), Maidstone Hospital and Tunbridge Wells NHS Trust.

Primary Hyperparathyroidism (PHPT) is recognised biochemically as a spectrum of disease. One of the early phases is normocalcaemic primary hyperparathyroidism (NPHPT). Its incidence and prevalence is largely unknown.

There is lack of awareness amongst health care professionals on this. As clinicians, we need to recognise NPHPT promptly as patients are at increased risk of complications in the long run such as risk of fractures, nephrolithiasis, neuropsychiatric disease and cardiovascular disease.

NPHPT is confirmed with two measurements of normal calcium, with inappropriately high PTH levels, at 3-6-month intervals, after excluding secondary causes like vitamin D deficiency, renal failure, hypercalciuria, malabsorption syndrome etc.

Assessment of NPHPT includes annual bone profile and vitamin D. In addition, we must also screen for end organ damage with 3-5 yearly renal US (18.2% prevalence of nephrolithiasis), DEXA scan (57% prevalence of osteoporosis) and monitor for progression to PHPT (40%).

Follow up includes surveillance, medical management or definitive treatment with parathyroidectomy.

In our study, we have reviewed our current practice in Maidstone hospital.

Between June 2018 and September 2018, we identified 60 patients who had elevated PTH and normal calcium. All patients had their renal function checked. However, only 14 patients had repeat calcium levels done. Only 27 patients had their vitamin D levels assessed and only 39 patients had serum phosphate levels checked. 14 people had a DEXA scan, and 25 had renal US scan. 2 patients out of 65 were found to have NPHPT.

We are in the process of doing retrospective and prospective analysis, including recruiting more patients into this study.

Our aim is to formulate a local guideline to identify and treat NPHPT promptly.

Our questions to the audience are;

1. Are you aware of NPHPT and its prevalence in your local population?
2. Do you have any systems in place in your MDT environment?
3. What will be the potential cost implications to the services?

**Y004**

## Hyponatraemia secondary to the deficiency of adrenocorticotropic hormone

Ala Haqiqi[1], Karim Meeran[1].

Department of Endocrinology and Diabetes, Charing Cross Hospital, Imperial College Healthcare NHS Trust, London, UK.

**Introduction:** 10% of intracranial tumours are pituitary, and ~30% of the pituitary adenomas are non-functioning. The symptoms of pituitary adenomas could be due to mass effect causing alteration in pituitary hormone production. Pituitary tumours are the most common cause of hypopituitarism. Hyponatraemia is often encountered in clinical practice, and it can be secondary to many conditions including syndrome of inappropriate anti-diuretic hormone secretion (SIADH), and hyponatraemia associated with low cortisol level.

It is thought that a possible mechanism of apparent SIADH secondary to adrenocorticotropic hormone (ACTH) deficiency is likely related to the effect of cortisol in suppressing vasopressin action by allowing free water clearance.

Here we report a case of hyponatraemia associated with ACTH deficiency on the background of non-functioning pituitary adenoma in an elderly patient.

**Report of the Case:** A 78-year-old lady presented to the emergency department with a 2-month history of fatigue, nausea, weight loss, and abdominal pain (with previously normal blood electrolytes 7 days prior to her admission). She was subsequently admitted and noted to have hyponatraemia with sodium of 122. Initially based on the findings of paired osmolality and hyponatraemia, the possibility of SIADH was considered.

Biochemistry results were as follows:

Blood Osmolality 246 mOsm/kg

Urine Osmolality 544 mOsm/kg

Urine Sodium level 99 mmol/L

Urine Potassium level 51.7 mmol/L

Cortisol level was 36 nmol/L

Prior to this admission, the patient was worked up for gastrointestinal malignancy in the outpatient setting. The investigations showed no evidence of malignancy, and the patient was subsequently discharged from gastroenterology care. However, the patient's symptoms had not resolved.

This patient had a background of a non-functioning pituitary macro-adenoma with haemorrhagic change which was diagnosed 10 years prior to this presentation. Previous follow-up scans demonstrated stable appearance initially and reduction in size over serial imaging, with normal pituitary function on dynamic testing in 2016. The patient was also clinically asymptomatic. Hydrocortisone replacement therapy was therefore stopped. It was however decided to maintain her thyroxine treatment.

Around the time of admission, a 3-year interval magnetic resonance imaging (MRI) scan demonstrated significant increase in the size of the residual adenoma with a mixed solid but predominantly cystic composition. The visual fields were not affected on testing.

Based on the past medical history, clinical, radiological and biochemical findings, ACTH deficiency was postulated as a cause for this presentation. The patient was commenced on prednisolone 4mg once daily as replacement with immediate clinical and biochemical improvement within only 2 days:

Blood Osmolality 285 mOsm/kg

Urine Osmolality 101 mOsm/kg (so much improved free water clearance)

Urine Sodium level <20 mmol/L

Urine Potassium level 2.8 mmol/L

Clinical and imaging follow up were recommended by the pituitary multidisciplinary team (MDT). During follow up consultations, the patient has been feeling much better on prednisolone and levothyroxine replacement.

This case highlights the importance of considering ACTH deficiency as one of the causes of a presentation mimicking SIADH.

**Learning Points:**

- Always consider pituitary adenomas –hypopituitarism and low cortisol level as differential diagnosis with a biochemical picture of SIADH. It is essential to always exclude endocrine causes in SIADH presentation.

- Bear in mind that although the pituitary tumour appeared stable on serial imaging, there is always a risk of recurrence.

**References:**

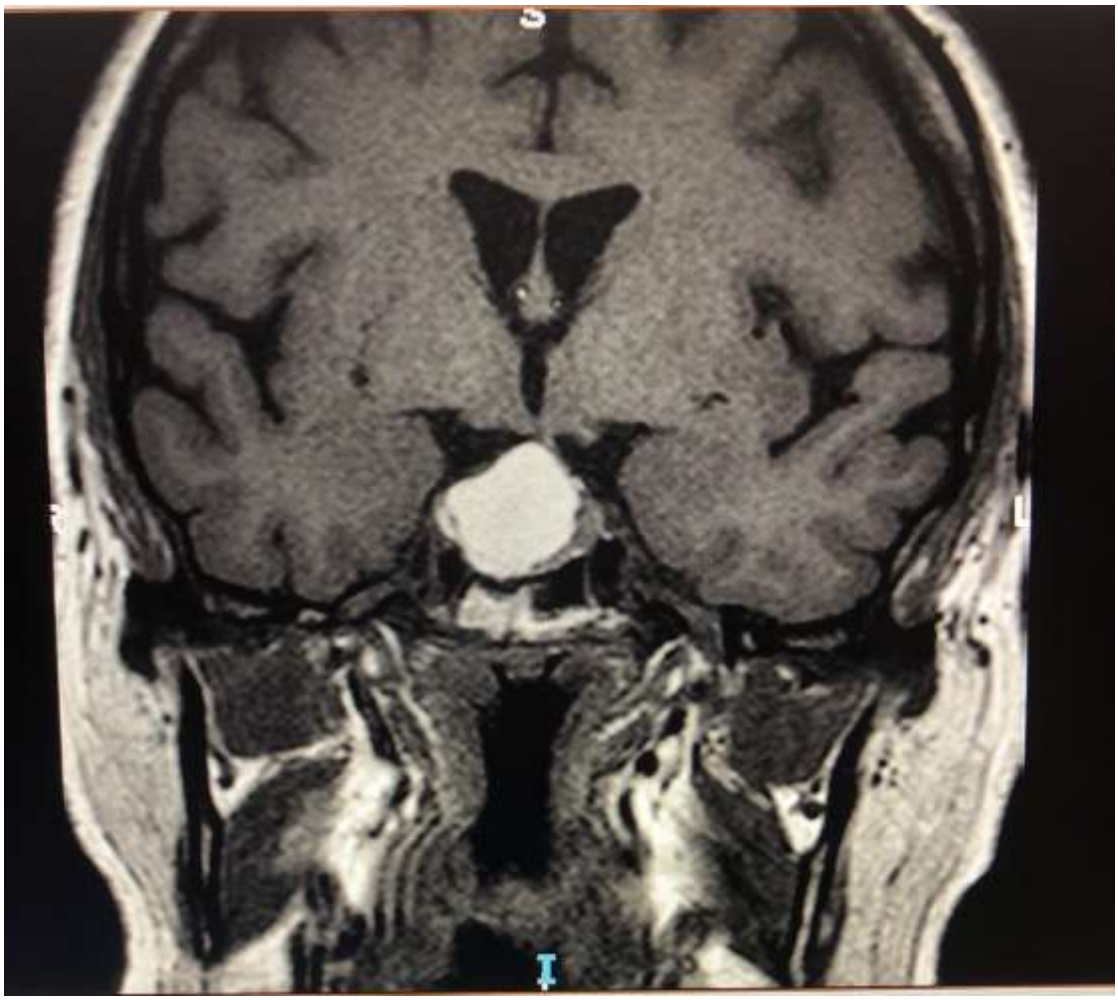
1.Gsponer J, De Tribolet N, Déruaz JP, Janzer R, Uské A, et al. Diagnosis, treatment, and outcome of pituitary tumors and other abnormal intrasellar masses. Retrospective analysis of 353 patients. Medicine (Baltimore). 1999 Jul;78(4):236-69.

2. Snyder P. Clinical manifestations and diagnosis of gonadotroph and other clinically nonfunctioning pituitary adenomas. UptoDate. Last updated: May 18, 2018.

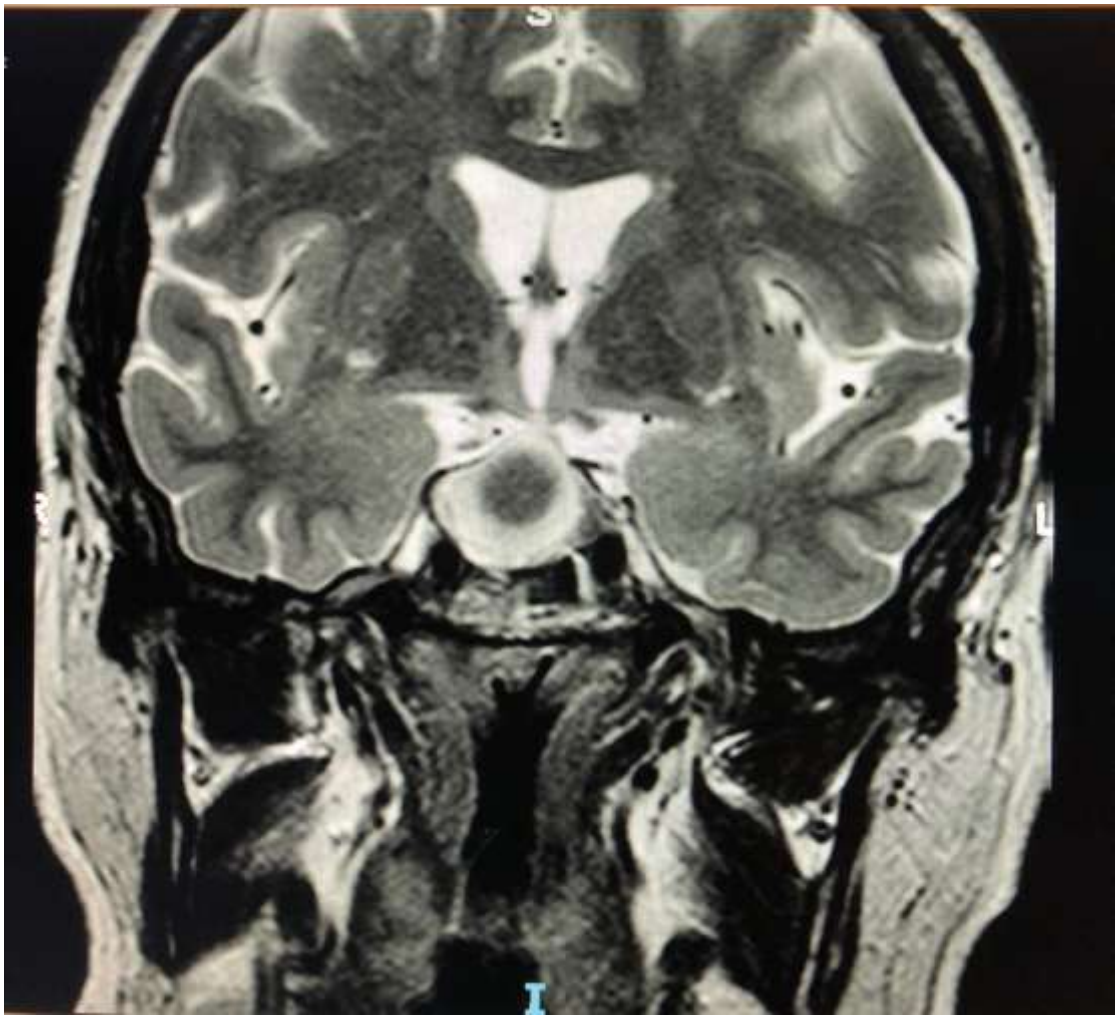
3. Oelkers W. Hyponatremia and inappropriate secretion of vasopressin (antidiuretic hormone) in patients with hypopituitarism. N Engl J Med. 1989;321(8):492.

4. Asano T, Aoki A, Sasaki M, Ikoma A, Kakei M, et al. Hyponatremia is the valuable manifestation for initiating diagnosis of hypopituitarism in elderly. *Endocrine Journal.* 2012, 59 (11):1015-1020.

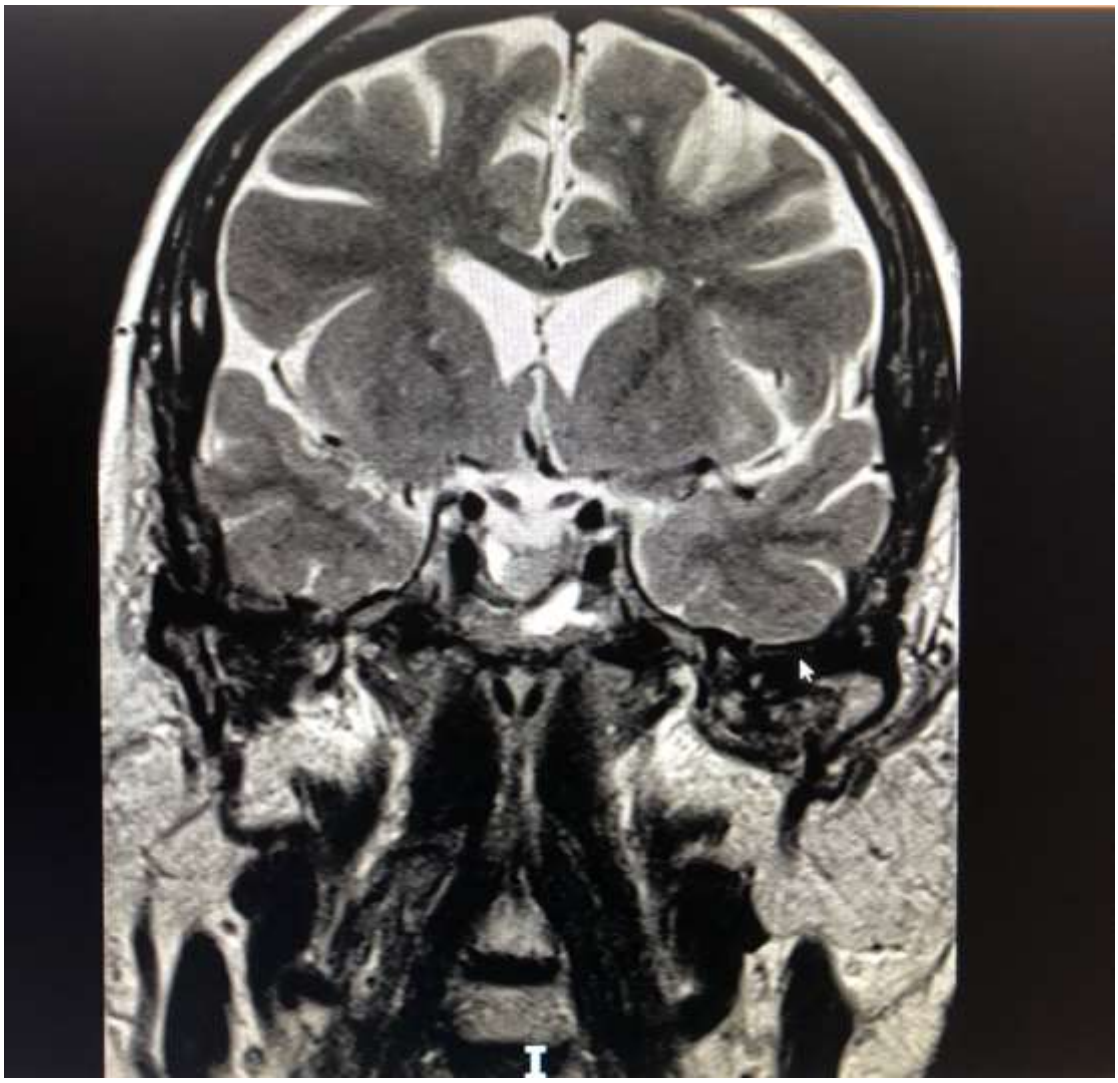
2008 MRI Scan:



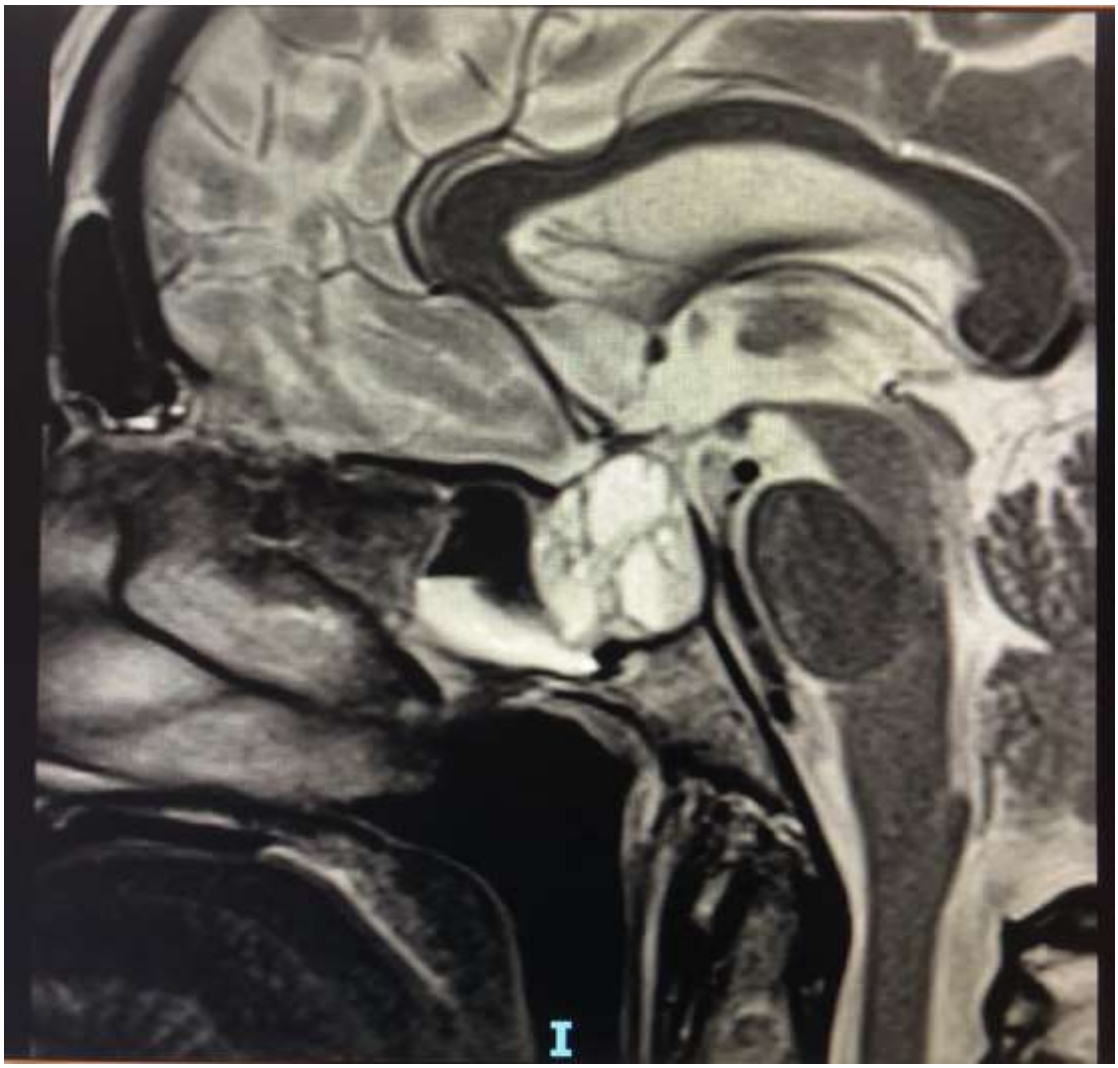
2008 MRI Scan:



Follow-Up MRI Scans:



MRI August 2018:



**Y005**

## Acromegaly with Non-PTH related Hypercalcemia

Raya Almazrouei, Alexander Miras**,** Imperial College Healthcare NHS Trust, London, UK.

**Background:** Hypercalcemia is rare with acromegaly and usually attributed to co-existent primary hyperparathyroidism. Patients with acromegaly frequently have mild hyperphosphatemia and hypercalciuria, while it is rarely to have overt hypercalcemia. Recent published case reports link acromegaly with hypercalcemia mediated by elevated 1,25(OH) vitamin D.

**Case:** We report a 33 year-old man diagnosed with acromegaly that was picked up when he presented with lower gastrointestinal bleeding with negative colonoscopy. Subsequently he reported having intermittent headache and symptoms suggestive of obstructive sleep apnoea. In addition, he witnessed marked change in the size of his feet and hands. He put on weight of around 34 kg during the last 10 years. He reported no history of kidney stones. On examination, he weighed 124 kg with BP of 174/103 and he had classic acromegaly picture with large spade like hands, which were sweaty. He had prominent periorbital ridges and zygomatics, mild prognathism, no interdental space widening or visual field loss.

**Investigations (Table):** showed markedly elevated GH and IGF-1 along with mildly elevated calcium that was confirmed on repeat testing a week later. The mild hypercalcemia was non PTH related as his PTH level was in the low-normal range 3.5 pmole/L. His 24-hour calcium that was done in another day showed marked hypercalciuria of 10.24 (2.5-7.5) mmol/day. MRI pituitary confirmed adenoma of 14x20 mm in size.

**Management:** Three months later, the patient had trans-sphenoidal surgery with histology confirming somatotroph adenoma. Three weeks postoperatively, his bone profile showed normalization of adjusted calcium and paradoxical initial rise in PTH level with normal vitamin D level (after replacement). In October 2018 (5 months post-surgery), his labs showed normocalcemia with normal PTH and vitamin D levels. Molecular genetic sequence and MLPA analysis revealed no pathogenic variant of MEN1, AIP and CDK1B genes.

**Conclusion:** Despite that we did not measure the active 1,25(OH) vitamin D in this case; the sequence of bone profile is suggestive of Non-PTH mediated hypercalcemia with relatively low PTH in the first instance. Postoperatively, calcium, phosphate and PTH levels normalized. It is likely that this occurs late in the course of active uncontrolled acromegaly as GH-IGF-1 mediate increase synthesis of 1,25(OH) vitamin D synthesis.

| **Table** | **Initial 1st Set** | **Initial 2nd Set** | **3 weeks Post surgery** | **5 months Post surgery** |
|---|---|---|---|---|
| **IGF-1 (10.5-32) nmole/L** | 133 | | 47.1 | 45.3 |
| **Random GH ug/L** | 11.2 | | <0.05 | |
| **C-calcium (2.2-2.6) mmole/L** | 2.77 | 2.63 | 2.37 | 2.4 |
| **Phosphate (0.8-1.5) mmole/L** | 1.53 | 1.29 | 1.13 | 1.24 |
| **PTH (1.6-7.2) pmole/L** | | 3.5 | 7.8 | 4.7 |
| **25 (OH) Vitamin D (70-150) nmole/L** | | 42 | 78.8 (after replacement) | 69.7 |

**Y006**

## Late presentation of a GLUD-1 activating mutation: consider this rare genetic cause in adults with fasting and protein-sensitive hyperinsulinaemic hypoglycaemia

Samuel Conway[1], Bhavika Sethi[1], Clare Gilbert[2], Kate Green[2], Carol Jairam[1], Nick Oliver[1], Pratik Shah[2] & Shivani Misra[1]

[1]St. Mary's Hospital, Imperial College Healthcare NHS Trust.

[2]Great Ormond Street Hospital.

We present the case of a 35-year-old man with a history of childhood epilepsy and symptoms consistent with hypoglycaemia. The episodes of hypoglycaemia were mild and had never been formally investigated. He had identified that protein rich meals precipitated the symptoms and so avoided high protein content foods.

At the age of 9 months, his daughter presented with hypoglycaemic seizures and hyperammonaemia was noted on her metabolic screen. The hypoglycaemia was found to be protein-sensitive, commencing shortly after she had started weaning and was associated with hyperinsulinism. Genetic testing confirmed a GLUD-1 heterozygous missense mutation causing hyperinsulinaemia and hyperammonaemia syndrome (HIHA). Her hypoglycaemia was managed with diazoxide and a protein-restricted diet. Mutations in GLUD-1 causing HIHA usually occur *de novo* but can be autosomal dominant therefore parental testing was requested. This confirmed the same pathogenic mutation in her Father.

HIHA is characterised by fasting and protein-sensitive hypoglycaemia along with asymptomatic hyperammonaemia. It is caused by an activating mutation in the gene encoding the mitochondrial enzyme, glutamate dehydrogenase *(GLUD-1*), responsible for oxidative deamination of glutamate to alpha-ketoglutarate and ammonia. The most common additional features are epilepsy and learning difficulties presenting in late-infancy. These neurological defects may be independent of hypoglycaemia, which is usually managed effectively with diazoxide.

Our case had a milder phenotype than his daughter and in retrospect, his childhood seizures may have been hypoglycaemia-induced. He still reports symptoms of hypoglycaemia but has managed these with dietary changes. In addition to epilepsy, he was noted to have hyperammonaemia (random plasma ammonia 116 umol/L, normal range <50) but has no documented history of learning difficulties.

Our case highlights the variable phenotype and incomplete penetrance observed in GLUD-1 mutations. Though classically presenting in infants, this phenotype warrants consideration in adults with hyperinsulinaemic hypoglycaemia for which other causes have been excluded, even in the absence of a family history and especially in the presence of hyperammonaemia.

**Y007**

## HCG and diet: The ultimate way of fat burning

Casey F, Darby L, Campioni-Norman D, Shah P, Das G, Department of Endocrinology, Ashford and St Peters hospital NHS Trust.

We present the case of a 21-year-old male who initially presented to his GP with gynaecomastia, lethargy and erectile dysfunction. He had no relevant past medical history but a positive family history for testicular cancer, which his father had received surgery for. With no regular medications, this normally fit and well individual worked as a gardener lives with his parents and is very health conscious through a lifestyle of healthy eating and regular exercise at the gym.

Following referral to the endocrinology clinic for further evaluation, all examination findings remained normal including genitalia and secondary sexual characteristics. Initial hormonal profile from the GP showed normal gonadotrophin levels and sex steroid hormones with a slightly raised prolactin (FSH 5IU/l, LH 2.8IU/L, Testosterone 10.3nmol/L, Oestrogen <80pmol/L, Prolactin 409mU/l). Ultrasound of the scrotum displayed small bilateral varicoceles and a plain chest film returned normal. Further and repeat blood tests showed significantly raised human chorionic gonadotrophin and oestrogen levels and suppressed gonadotrophins (HCG 16IU/L, FSH <1IU/L, LH <1IU/L, testosterone 24.1nmol/L, oestrogen 196pmolL). On further questioning the patient admitted, in an attempt to improve his physique, to be injecting into his arms a product he ordered on the internet that promised to increase testosterone levels, the packaging of which describes the contents as “Natural, highly purified HCG”.

The patients’ initial research had also identified increased oestrogen levels as a side effect of the injections. To counteract this effect, he purchased and had been taking a supply of Tamoxifen and Clomiphene

**Discussion:** Gynaecomastia is a benign enlargement of male breast glandular tissue. It is frequently encountered by endocrinologist as a result of patient’s cosmetic concern or pain. Breast malignancy is the most concerning diagnosis and other cause is pseudogynaecomastia because of fat without glandular proliferation.

Gynaecomastia occurs as a result of imbalance in the free oestrogen to free testosterone ratio. The most frequent non physiological cause is medications.

Our case shows how important it is to check medication history and usage of over the counter and over the internet medication as one of the differential in this case was possibility of testicular germ cell tumour.

**Y008**

## Severe triglyceridaemia in PPAR-gamma mutations: uncommon cause often overlooked

Raya Almazrouei, Ben Jones, Sara Haboosh, Jaimini Cegla, Shivani Misra, Imperial College Healthcare NHS Trust, London, UK.

**Case:** A 28-year-old woman was found to have severe hypertriglyceridemia (63 mmol/l) after presenting with a skin rash consistent with eruptive xanthoma. She had been diagnosed with type 2 diabetes 18 months previously, was managed with metformin and had a history of hypertension, treated with ramipril and amlodipine. Her deceased father had multiple cardiovascular events in his 50's. She had 13 half siblings (paternal side) of whom three had developed diabetes in their 40s. On examination, her BMI was 24.9 kg/m$^2$. Blood results demonstrated hypercholesteroalemia (total Cholesterol 19.4 mmol/L), sub-optimally controlled diabetes (HbA1c 84 mmol/mol) and normal thyroid function.

**Lipid Management:** Acutely, variable rate intravenous insulin was commenced and a low-fat diet implemented. She was discharged on basal insulin, metformin, atorvastatin, ezetimibe and fenofibrate along. At follow-up, ApoE genotyping revealed zero copies of ApoE2 and her carotid US was normal. She was referred to the non-classical diabetes clinic due to lack of clarity around her diabetes diagnosis.

**Diabetes assessment:** Lipodystrophic features were noted subsequently with central obesity but marked loss of subcutaneous fat in the distal limbs along with calf muscle hypertrophy. Following dramatic changes in lifestyle and weight loss, the patient had stopped insulin and her HbA1c was 35 mmol/mol off all diabetes treatments. Triglycerides were 0.97mmol/L on statin monotherapy. Based on the observed phenotype, genetic testing for familial partial lipodystrophy (FPL) was undertaken and a heterozygous PPAR-gamma mutation (Val318Met) was identified.

**Discussion**; PPAR-gamma mutations causing FPL type 3, are usually autosomal dominant and typically present in the second decade of life. Unlike lamin A mutations (a more common cause of FPL), mutations in PPAR-gamma present more frequently with lipid abnormalities, hypertension and diabetes may be a late feature. The high doses of insulin associated with severe insulin resistance syndromes are late features of these conditions and practitioners should be alert to the earlier metabolic presentations and clinical features, such that a genetic diagnosis can be made earlier and the high cardiovascular risk can be managed promptly.

**Y009**

## Hemi-ballismus as a presentation of hyperglycaemia and the classical neuro-imaging findings

Campioni-Norman D, Casey F, Darby L, Shah P, Das G, Department of Endocrinology, Ashford and St Peters hospital NHS Trust

We present the case of a 70 year old male who presented to Accident and Emergency with a 4-day history of progressively worsening right sided hemi-ballismus. Alongside this he had widespread joint pain, synovitis and dactylitis. There was no other neurological deficit, and he had no other presenting symptoms. The patient had a background of poorly controlled diabetes, managed with Metformin recent diagnosis of prostate cancer, ischemic heart disease and psoriatic arthritis.

On admission the patient was afebrile with stable observations. Routine blood tests results were within normal range. His Hb A1C was grossly elevated at 134mmol/mol, and his blood glucose was 29mmol/L. CT imaging showed no acute large vessel ischaemia or haemorrhage, but showed subtle high attenuation of the left caudate and lentiform nucleus. MRI confirmed no acute haemorrhage or infarct, and showed the T1 attenuation in the left basal ganglia to be most likely due to calcification or mineralisation.

Patient was treated along the line of hyperglycemic hyperosmolar state with ongoing hemiballismus. He was also treated for a flare of his psoriatic arthropathy during this admission. The patient's diabetes medication regime was intensified to improve his blood sugar control. On successful management of the hyperglycaemia the patient's hemi-ballismus resolved within 4 days

**Discussion:** Hemi-ballismus is a disorder of involuntary, continuous irregular movement involving one side of the body. It is caused in most cases by decrease in activity of the subthalamic nucleas of the basal ganglia. Causes of hemi-ballismus include stroke, malignancy, non-ketotic hyperglycaemia, Wilson's disease, as well as infective causes such as HIV associated toxoplasmosis.

Hyperglycaemia and severe non ketotic hyperglycemia is thought to be the second most common cause of hemi-ballismus in elderly, and this case has highlighted to our trust the need to be aware of hyperglycaemia as a potential diagnosis. While hyperglycemia itself is not the cause of the hemiballistc movements, it has been postulated that hyperviscosity of blood leads to some degree of ischemia at the basal ganglia causing decreased production of GABA and acetylcholine which causes further disruption of normal neuronal impulse transmission and circuit.

Another interesting point from this case is the characteristic findings of hyper intensity in the basal ganglia, the current hypotheses surrounding the pathogenesis of this and how the potential mistake of diagnosing it as a small haemorrhagic stroke on neuro- imaging can be made.

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**Y010**

## Don't miss neonatal thyrotoxicosis - the importance of assessing an at risk baby at 7 days

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**Background:** Maternal Graves' disease can lead to neonatal thyrotoxicosis due to trans-placental passage of maternal activating TSH receptor antibodies.

**Clinical Case:** This 31 year old lady presented following a 3 year history of neck swelling, palpitations, sweating and heat intolerance. She had previously been managed abroad with carbimazole though the details were not known. Examination revealed a diffusely enlarged goitre, exophthalmos and lid lag. Blood results were in keeping with thyrotoxicosis with a TSH of <0.02mU/L, free T4 of 77.7pmol/L and free T3 of 24.6pmol/L. The patient reported to be pregnant and was at around 6 weeks of gestation. TSH receptor antibodies were markedly raised at 28.8U/l (<1.0U/l). She was managed with antithyroid medication – propylthiouracil in the first trimester followed by a titrated dose of carbimazole throughout the rest of pregnancy with gradual improvement in her thyrotoxicosis symptomatically and biochemically.

Due to the markedly elevated maternal TSH receptor antibody titre, a neonatal alert was raised for the paediatricians. Antenatal ultrasonography demonstrated foetal goitre but no evidence of foetal hyperthyroidism. After delivery, neonatal thyroid function tests on day 5 demonstrated a TSH 5.12mU/l, free T4 34.2pmol/l and free T3 8.5pmol/l, likely representing a euthyroid state at this age and the baby was asymptomatic. However, assessment a week later revealed tachycardia and significant abnormalities in TFTs with TSH suppressed at 0.07mU/l, free T4 >100pmol/l and free T3 18.3pmol/l in keeping with neonatal thyrotoxicosis. Neonatal treatment with carbimazole was commenced, titrated to thyroid function test results and stopped after 10 weeks with an excellent clinical and biochemical outcome.

**Conclusion:** This case highlights the importance of checking TSH receptor antibody titre during pregnancy in patients with a history of thyrotoxicosis and informing the paediatric team if the titre is raised. It also demonstrates that neonatal thyroid function testing shortly after birth can often be falsely reassuring due to the effect of trans-placental passage of maternal anti-thyroid drugs and that early reassessment of the infant and retesting of thyroid function at 7 days is essential.

Good communication between all clinical teams managing the patient is crucial.

**Y011**

## A case of 'non-classic' Non-Classic Congenital Adrenal Hyperplasia

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We present a case of a 28-year-old Portuguese lady, who presented with oligoamenorrhoea and hirsutism since menarche, at age 11. She had been treated with the oral contraceptive pill for 12 years, for a diagnosis of polycystic ovarian syndrome, despite a BMI of 21 kg/m$^2$. She also complained of chronic fatigue.

Blood pressure was 101/66mmHg. Baseline electrolytes showed sodium 140mmol/L, potassium 3.6mmol/L. Short synacthen test (SST) confirmed the biochemical diagnosis of congenital adrenal hyperplasia (CAH) [17-hydroxyprogesterone of 32.5nmol/L (0min), 173.5nmol/L (30min), 201.2nmol/L (60min)]. Long synacthen test revealed cortisol of 356 nmol/L (0min), 389 nmol/L (30min), 488 nmol/L (60min), 534 nmol/L (240min), 586 nmol/L (360min), 815 nmol/L (440min), 279 nmol/L (2880min). Aldosterone activity was reduced at 60pmol/L. The cortisol aspect of the SST was: cortisol 275nmol/L (0min), 335nmol/L (30min), 371nmol/L (60min) and when repeated: 407/431/429nmol/L at respective times. Prolonged oral glucose tolerance test revealed hypoglycaemia at 3 hours post-glucose load (glucose 2.1mmol/L) with appropriate spontaneous recovery (glucose 4.1 mmol/L at 300min). Long synacthen test showed a baseline cortisol of 356nmol/l with a peak cortisol of 815nmol/L.

Genetic testing confirmed non-classical CAH due to 21-hydroxylase deficiency. She was heterozygous for CYP21A2 c89C>T p.P30L and c. 841G>T p.V281L mutations with normal CYP21A2 copy number. She started Dexamethasone 0.25 mg daily and responded well. Androstenedione levels decreased to 11.4nmol/L. She is still complaining of fatigue but is menstruating regularly and has been counselled towards planning a pregnancy.

The 21-hydroxylase enzyme is encoded by the CYP21A2 gene and 12 mutations account for almost 95% of cases of the non-classic phenotype of CAH. p.V281L and p.P30L are both missense mutations that tend to confer a mild phenotype as they allow for 20-50% of normal enzyme activity. Despite general correlations, the CYP21A2 deficiency phenotype does not always correlate precisely with the genotype. This suggests that other genes influence the clinical manifestations. In this case where two of the commonest mutations co-exist, symptoms and signs would place this patient in a 'phenotypical spectrum' between CCAH and NCAH. Utilizing rigid criteria to distinguish among salt wasting, simple virilizing and NCAH can be problematic because impaired 21-hydroxylase function represents a continuum of decreased enzyme activity, as in this patient.

**Y012**

## The Natural History of Silent Corticotroph Adenomas: A Tertiary Referral Centre Experience

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**Background:** Non-functioning pituitary adenomas (NFAs) are tumours which do not secrete pituitary hormones. Silent corticotroph adenomas (SCAs) are an NFA subtype which are immunoreactive for adrenocorticotropic hormone (ACTH) but present without clinical or biochemical evidence of hypercortisolism. There is debate as to whether SCAs follow a more aggressive clinical course in comparison to other NFAs.

**Aims:** To compare the clinical and radiological characteristics of SCAs with other pituitary NFAs.

**Methods:** A retrospective analysis was performed of patients who had undergone trans-sphenoidal surgery at Charing Cross Hospital, Imperial College Healthcare NHS Trust. Electronic patient records were reviewed for comparison of pre-operative and post-operative characteristics between SCA and NFA patients.

**Results:** 14 SCA patients were identified and a cohort of 127 NFA patients were studied for comparison. Whilst sex was not significantly different between the two groups, SCAs presented at a younger age in comparison to NFA patients (mean ± SEM; 58.0 ± 1.15 [NFA] vs. 48.1 ± 3.95 years [SCA], $p<0.01$). Presenting symptoms and mode of presentation were comparable between SCA and NFA patients. Radiological characteristics, including cavernous sinus invasion and suprasellar extension, were also similar. Post-operatively, there was no statistical difference between the proportion of tumours that exhibited a Ki-67 of less than or more than 3% between the NFA and SCA cases. However, SCA patients exhibited an increased recurrence rate compared to the NFA group (18.1% [NFA] vs. 50.0% [SCA], $p=0.01$) and were more likely to recur multiple times i.e. were recorded to have recurred 2 or more times in the duration of this study (0% [NFA] vs. 21.4% [SCA], $p=0.001$). Kaplan Meier analysis showed SCA patients exhibit faster progression to tumour recurrence ($p<0.005$). Radiotherapy was required by a significantly greater proportion of the SCA patients than NFAs (13.4% [NFA] vs. 50% [SCA], $p<0.005$).

**Conclusions:** SCA patients presented at a younger age and demonstrated an increased propensity to pituitary tumour recurrence compared to those patients with NFAs. This study supports closer post-operative surveillance and early discussion for adjuvant radiotherapy in patients with a SCA.

**Y013**

## Phaeochromocytoma Crisis: Adrenal Incidentaloma with Contralateral Renal Infarction and beta blockade administration

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**Introduction:** Phaeochromocytomas are rare catecholamine-secreting tumours that can present as an incidental finding on radiologic investigation. Adrenal incidentalomas are common and may be benign or malignant and functional or non-functional. Therefore, it is crucial to safely characterise the adrenal mass in order to treat appropriately. Here we describe a case of an incidental finding of a large phaeochromocytoma presenting with contralateral renal infarction and severe haemodynamic instability.

**Case Presentation:** A 65-year-old female with a past medical history of type 2 diabetes presented to the emergency department with an acute onset of severe abdominal pain. Examination findings were unremarkable but vital signs showed a blood pressure (BP) of 215/106 mmHg. Computed tomography (CT) of the kidneys, ureters and bladder, and subsequently CT of the abdomen demonstrated an incidental finding of a large mass in the left suprarenal region measuring 6.7 x 7.1 x 10 cm and an infarct of the upper and midpole region of the right kidney. The patient was admitted under Urology for right kidney infarction and started on a heparin infusion. The high systolic BP (> 200 mmHg) was unresponsive to nifedipine and metoprolol was then added. The endocrinology team was consulted for the adrenal mass. Doxazosin and intravenous fluids were started immediately, and all beta-blockers were stopped as phaeochromocytoma was suspected. On targeted questioning, the patient reported episodic symptoms consistent with paroxysmal catecholamine secretion. The patient was admitted to the high dependency unit for management of her severe haemodynamic instability exacerbated by beta blockade with organ dysfunction. Phenoxybenzamine followed later with propranolol for tachycardia were subsequently started and titrated. Plasma metanephrines were grossly elevated confirming a diagnosis of phaeochromocytoma. She proceeded to laparoscopic adrenalectomy, which was uncomplicated. BP on discharge was <145 mmHg. Histology confirmed an aggressive phaeochromocytoma (Ki67 up to 7%, PASS score 5).

**Discussion:** This case demonstrates the need to consider phaeochromocytoma in an adrenal incidentaloma, particularly in the presence of severe hypertension, organ damage, and diabetes with a low BMI. It also highlights the importance of not starting beta blockade until sufficient alpha blockade with co-existent fluid repletion has been achieved. Phaeochromocytoma crisis can present with any organ involvement. This case adds to the literature of cases presenting with renal infarction, which is thought to be caused by systemic catelcholamine-induced vasoconstriction or thrombosis. This case also illustrates that even large pheochromocytomas could be cautiously operated on laparoscopically.

**Y014**

## A masquerading parathyroid carcinoma

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A 79-year-old man underwent routine biochemistry tests at the GP, showing hypercalcaemia of 2.77. Further testing confirmed primary hyperparathyroidism (PTH 14.4), and the patient was referred to the endocrinology team. The patient was worked up for parathyroidectomy, and ultrasound and fine needle aspiration cytology (FNAC) demonstrated a left inferior parathyroid adenoma, but also right-sided thyroid nodule which was U5, Thy4. A sestamibi scan showed an avid area in the left lower lobe of thyroid consistent with a probable parathyroid adenoma, but also highlighted the right-sided presumed thyroid nodule with high uptake. The patient underwent targeted left inferior parathyroidectomy and right hemithyroidectomy.

Interestingly, histology showed that the right sided mibi-avid nodule was in fact a parathyroid carcinoma rather than a thyroid nodule. The left inferior parathyroid adenoma was confirmed. Further to this there was an incidental micropapillary thyroid cancer (pT1a N0).

As far as we are aware, this is the first reported case of this trio of pathologies, discovered synchronously in one patient. It highlights the need for suspicion of mibi-avid, presumed thyroid nodules in the setting of hypercalcaemia, even when an ultrasound and FNAC are consistent in reporting thyroid pathology.

**Y015**

## False positive diagnosis of a paraganglioma of the organ of Zuckerkandl

Samir Damji, Rashpal Flora, Jeannie Todd, Fausto Palazzo, Imperial Healthcare NHS Trust.

**Case:** A 66-year-old lady was discovered to have a 3.7cm mass at the aortic bifurcation after being investigated for back pain. She had a past medical history of endometrial carcinoma, diagnosed 18 years ago and subsequently underwent a total hysterectomy and external beam radiotherapy. Following an MDT review, a suspicion was raised that the lesion may have been a paraganglioma. Subsequent testing for urinary metanephrines was negative however a there was a borderline increase in plasma metanephrine of 1290 pmol/L, with a normal upper limit of 1180 pmol/L. Molecular genetic testing for familial paraganglioma/phaeochromocytoma did not detect a pathogenic variant. The patient underwent whole body $^{68}$Gallium DOTATATE PET-CT scanning, which identified avid uptake of tracer and somatostatin receptor positivity in the mass at the aortic bifurcation, in keeping with a paraganglioma of the organ of Zuckerkandl. Following review at the NET MDT a decision was made to proceed with surgical resection and the patient underwent pre-operative anaesthetic assessment and optimisation with alpha-blockade. An open resection of the paraganglioma with lymphadenectomy was performed and the patient made an uncomplicated recovery and was discharged on the 6$^{th}$ post-operative day. The histopathological analysis of the mass at the aortic bifurcation showed a 30mm lymph node infiltrated by a metastatic malignant tumour. The morphology and immunoprofile was in keeping with a metastatic carcinoma of the female genital tract, likely a poorly differentiated endometrial carcinoma. There was no evidence of a paraganglioma.

**Discussion:** Neuroendocrine tumours arising from extra-adrenal ganglia are rare tumours, however they are associated with high morbidity and mortality. Whilst the mainstay of treatment is surgical resection, the diagnosis and localisation is often challenging and complex. However, with the increasing advancement and availability of PET imaging, somatostatin analogues have been labelled with positron emitting isotopes such as Gallium-68, to image somatostatin receptor expressing neuroendocrine tumours. It has been demonstrated that $^{68}$Ga-DOTATATE PET scans can significantly improve the spatial resolution and lesion detectability compared to MIBG scintigraphy, CT or MRI. A number of studies have confirmed a sensitivity between 85%-100% and specificity between 82%-90% in the ability to diagnose NETs. Although a highly sensitive and specific imaging modality, and whilst extremely rare the physician must be aware of physiological and pathological processes which may lead to interpretive errors. We present the first described metastatic, endometrial carcinoma with somatostain receptor expression resulting in a false positive diagnosis of a paraganglioma of the organ of Zuckerkandl.

**Y016**

## Case Report: Recurrent primary hyperparathyroidism during pregnancy in MEN1

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**The Case:** A 23-year-old female, mother of 1, with a 2-year history of lethargy, headaches and feeling of thirst was referred to the endocrinology outpatients by her GP with primary hyperparathyroidism (adjusted calcium 2.77 mmol/L with an inappropriately elevated PTH of 21.5 pmol/L). There was no family history of endocrine disease. Her 24 hr urinary calcium was normal. The patient underwent a targeted left inferior parathyroidectomy after concordant localisation studies (USS and Sestamibi scan). The ioPTH dropped by 70% at 10mins. The following day she remained hypercalcaemic A.Ca 2.67 mmol/L and PTH 6.2pmol/L. Histology showed an parathyroid adenoma weighing 610mg.

At 4 month follow up she was 9 weeks pregnant. Bone profile confirmed persistent primary hyperparathyroidism (Calcium 2.65 mmol/L and PTH 15.9 pmol/L). Prolactin was raised at 641 and IgF-1 was normal. She underwent genetic testing and was diagnosed to be an index case of MEN1.

A USS showed right superior 7mm elongated parathyroid gland behind the mid pole of the right thyroid lobe which was not evident on previous imaging. Four months later in her 2$^{nd}$ trimester of pregnancy she underwent cervical exploration and subtotal parathyroidectomy and thymectomy. Interestingly, only 2 parathyroid tumours were found and no 4$^{th}$ gland was identified (right inferior) suggesting she may only have 3 glands. One and a half glands were excised. At 6 week follow up her PTH was 1.9pmol/L and her calcium was normal at 2.28mmol/.

**Discussion points:** MEN1 is associated with multi glandular disease and therefore targeted parathyroidectomy is contraindicated. As we did not know the MEN1 diagnosis we did perform a targeted approach and there was a false positive ioPTH outcome.

The increase risk of maternal and foetal complications associated with HPT in pregnancy meant an earlier re-exploration (in her pregnancy).

There was a potential failure to find the fourth parathyroid or she may only have had 3 glands. She remains in follow-up.

**Y017**

## Screening for Graves' Orbitopathy in Endocrinology Clinic: A multi-disciplinary perspective

Ishani Barai, Parizad Avari, Vickie Lee, Wing-May Kong, Central Middlesex Hospital.

**Background:** Graves' hyperthyroidism occurs before or is concomitant with the diagnosis of Graves' Orbitopathy (GO) in 80% of patients. In practice, detection of GO is often based mostly on clinical examination instead of patient symptomatology. We investigate whether relevant assessment is made in endocrinology clinics to identify Graves' patients with clinically active GO and whether subsequent referral to ophthalmology is made for further assessment.

**Method:** A retrospective cohort review of electronic clinic letters of patients seen in endocrinology clinic at a North-West London District General Hospital over a 5-month period from February to June 2018. Patients with thyrotoxicosis were identified and reviewed for use of 'Vancouver Orbitopathy Rule' (VOR), a validated screening questionnaire for screening (sensitivity=0.76, specificity=0.82) of GO based on patient symptomatology. The letters were assessed for subsequent GO management from clinic including provisions of an early warning card, artificial tears (lubricant eye drops) or advising on selenium.

**Results:** A total of 229 consultations were reviewed of which 32% (n=74) of consultations (mean age 49years, female: 80%, male: 20%) were identified with thyrotoxicosis, excluding those with multi-nodular goitre. One-fifth (20%) had documented VOR questionnaire asked and approximately a quarter (22%) of these were referred to Ophthalmology. Of the new thyrotoxicosis patients (n=9), over half (55%) had documented VOR questionnaire whilst this was lower at 20% with the follow up patients. None were provided with an early warning card, artificial tears for GO or advised on selenium. Smoking status, which is a known risk factor, was documented in 46% of all cases.

**Conclusion:** Findings indicate that the VOR questionnaire is being documented for new patients but under-utilised with the follow up patients in endocrinology clinics. However, VOR questionnaire may have employed during the consultation but not documented in the electronic clinic letters. Greater emphasis is required on providing patients with early warning cards, artificial tears and selenium, in keeping with the latest TEAMed-5 guidance on thyroid eye disease.

**Y018**

## To treat or not to treat: An interesting case of alemtuzumab-induced thyroid disorder

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34 year old woman with the background of multiple sclerosis and autoimmune hypothyroidism (on levothyroxine 50 mcg OD for 10 years) was given alemtuzumab infusion in July 2017. As part of surveillance, her TFTs were checked regularly. She developed thyrotoxicosis in July (TSH <0.01, FT4 84) before her next alemtuzumab infusion in August. Her GP stopped levothyroxine and she was seen in the endocrine clinic urgently. She described symptoms of palpitations, heat intolerance and weight loss for last 2-3 weeks, which were improving. On examination, her heart rate was 100/min but sweating or tremors were not noted. Neck examination did not reveal goitre or thyroid bruit. There were no features to suggest graves eye disease. Her repeat blood test showed TSH <0.01, FT3 10.1 and FT4 30. Her TPO antibodies were 148 (positive) and TSH receptor antibodies were 1.3 (positive). In view of improving biochemistry, anti-thyroid medications were not initiated. Subsequently, her ultrasound thyroid showed increased vascularity throughout normal size thyroid suggestive of thyroiditis and no nodules were identified. Her technetium scan showed reduced uptake on right suggestive of recovering thyroiditis. She was diagnosed with alemtuzumab related thyroiditis on the background of autoimmune thyroid disease. She received alemtuzumab infusion in August and her thyroid function was monitored closely, which showed gradual improvement. Her most recent thyroid function showed TSH 0.02, FT3 5.7 and FT4 14.5.

The monoclonal antibody alemtuzumab has been associated with thyroid disorder in up to 30-40% patients. [1,2] While Graves disease is the most common disorder (70%), thyroiditis has been reported up to 4.9% cases. [3] As alemtuzumab-induced thyroid disorder can present unique challenges, it is extremely important to properly investigate and closely monitor such patients.

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**Y019**

## Gynaecomastia - an Endocrinological or a Surgical problem?

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Doing the right investigation at the right time is crucial in endocrinology. Nonetheless, an investigation led by a non-specialist is very tricky. We have an interesting case where breast surgeons investigated a patient for hypogonadism. As such, this is the second case in the literature.

**Case presentation:** A 66 year old gentleman was referred to the breast clinic for left sided gynaecomastia and ongoing fatigue. He had no complaints of erectile dysfunction. Interestingly, this gentleman had a right orchidectomy for chronic epididymitis 34 years ago. His background also includes a previous history of spinal fractures and osteopenia, COPD and hypercholesterolemia.

Breast surgeons arranged for serum hCG level to be measured, which revealed to be 5 IU/L using Roche assay systems (reference range of <3 IU/L). The biochemical picture was consistent with primary hypogonadism (FSH 110 IUL, LH 30.5 IUL and testosterone 2.5 nmol/L). He was referred to endocrinologists for the consideration of testosterone replacement therapy.

We understand that almost all patients referred with gynaecomastia to our surgical team had hCG, with estradiol, done as an initial biochemical assessment.

**Discussion:** Given the use of assays with highly specific monoclonal antibodies, cross reactivity is not a problem, thus, we can determine that in our patient hCG was found to be truly elevated. Even though it physiologically makes sense for hCG to be high, in practice, this is an unhelpful test in hypogonadism. In a small analysis at our local hospital, it was found that hCG level was requested 12 times in 2 months by breast surgeons alone for gynaecomastia cases. Taking into account that a single measurement of serum hCG runs at a cost of £5.97, we would like to challenge the use of hCG, especially in such scenarios, to avoid the high cost expenditure and potential patient discomfort, as well as unnecessary referrals. This brings the discussion as follows:

1. Would patients with gynaecomastia benefit more from having the first review by endocrinologists?
2. Do we need to make endocrinologists part of the MDT in such cases?
3. What is the gate keeping mechanism for running these tests?

**Y020**

## The Challenge of a Great mimic: Case report of Pheochromocytoma presenting as Acute Coronary Syndrome complicated by Retroperitoneal bleed and Multisystem Crisis.

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Pheochromocytomas are catecholamine secreting tumours of the adrenal medulla. They are present in 0.1-0.6% in hypertensive patients[1].10-30% are incidentally discovered by imaging[2]. A 50 year autopsy review of 40 000 cases, showed 76% of Pheochromocytomas were only identified after death[3]. Pheochromocytoma crisis, is a potentially lethal complication of Pheochromocytoma[4]. Management includes initial stabilization of the acute crisis followed by surgery[5].

**Case:** This 81 year old man was under investigation for a Right Adrenal lesion. He had episodes of labile blood pressure at home and presented to the Accident Emergency with Pheochromocytoma crisis mimicking Acute Coronary Syndrome. On arrival to the hospital, he was treated with dual antiplatelet agents and Coronary Angiogram showed Triple Vessel Disease with normal LV function. Doxazosin 1mg was stopped on arrival and was commenced on a Beta blocker. Next day he experienced cyclical episodes of hypertension and hypotension with clinical signs of peritonism. He underwent a CT Abdomen which revealed a massive retroperitoneal bleed and enlarged right adrenal gland. He was stabilised with phentolamine, fluid resuscitation, and blood transfusion, followed by an emergency laparotomy. He died 40 days later after a prolonged ITU stay complicated with Metabolic Encephalopathy, Klebsiella Sepsis and Hospital Acquired Pneumonia.

**Discussion**: Diagnosis of Pheochromocytoma is based on a combination of clinical findings and relevant tests. There is a high mortality of 28% following emergency resection of Pheochromocytoma[2,6] .Pheochromocytomas can present with a multi-system crisis[7]. Some of these features were observed in our patient.

**Conclusion:** Early recognition and prevention is the key, particularly given the high mortality for patients undergoing emergency resection of Pheochromocytoma.

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**Y021**

## Water-clear cell Parathyroid adenoma: rare case report

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### Objective

Water-clear cell parathyroid adenoma (WCCA) is an extremely rare cause of primary hyperparathyroidism (PHPT). Our objective was to report a patient with a WCCA that was managed by our Department and to review the relevant literature in order to further our understanding of this rare entity.

### Methods

We retrospectively reviewed the case notes, histopathological records and electronic notes of a patient with WCCA that was operated in our Endocrine Surgery department. Furthermore, we reviewed the relevant literature and report our findings using Medline database to search all the relevant medical data from 1946 till present without any language restriction using the keywords: water-clear-cell, water clear cell adenoma, water clear cell parathyroid adenoma.

### Results

A 73-year-old female was referred to our Department by her GP with an incidental finding of hypercalcemia. The patient was completely asymptomatic in terms of PHPT clinical features. Her biochemistry results revealed hypercalcemia (3.04 mmol/L), high parathyroid hormone (279 ng/l), Vitamin D of 73 units, eGFR of 64 and an increase in 24-hour urinary calcium extraction (9.0 mmol/D). After the diagnosis of primary hyperparathyroidism (PHPT) was established we proceeded to localisation studies. Parathyroid Ultrasonography scan showed a right 30x11mm parathyroid lesion with enlarged lymph nodes. The $^{99m}$Tc scan Sestamibi scan showed increased tracer accumulation at the right lower pole of the thyroid which failed to washout while SPECT CT confirmed a posterior right thyroid location. Bone densitometry showed osteoporosis at the patient's left wrist and osteopenia in her femurs.

In view of the extremely high calcium/PTH and the size of the lesion (3 cm) there was a concern for the possibility of parathyroid carcinoma and the patient had an oncologic operation (en bloc resection of right sterno-thyroid muscle, right thyroid lobe, right lower parathyroid, right level VI lymphadenectomy) in June 2018.

Histology revealed the presence of a 3.1 cm WCAA of the right lower parathyroid gland, limited to the gland; resection margins were free of neoplasm. The neoplasm was well-circumscribed and non-encapsulated. It showed a trabecular-nested pattern with no solid/diffuse areas; the reticuline pattern was preserved with no fibre destruction, the elastic fibres were preserved with no abnormal deposition, and no

fibrosis was identified on H&E or trichrome stained sections. A rim of compressed parathyroid parenchyma was noted at the periphery of the lesion and there was no extension or thyroid invasion. No lymphovascular or perineural invasion was seen. The tumour cells revealed broad water-clear cytoplasm, low nuclear pleomorphism, inconspicuous nucleolus, and <1 mitotic figure/10 HPF (no atypical mitoses after screening 40 HPF). PTH expression was identified at the cytoplasm periphery of the tumour cells. The Ki-67 labelling index was <1%. Twelve level 6 lymph nodes were excised with no malignancy. The thyroid lobe was within the normal histological limits.

In the immediate post-operative period the PTH dropped to 68 ng/l. The patient made an uneventful post-operative recovery and was discharged home on post-op day 1 with oral Alfacalcidol 1μgr BD, Calceos 1tab TDS and Sandocal tablets PRN. Oral calcium supplementation was discontinued on the 2$^{nd}$ week post-op and she has been normocalcemic up to her most recent follow-up. The case had been discussed in the endocrine multidisciplinary meeting and the consensus was that there should be ongoing monitoring of her calcium/PTH.

On the literature review we performed, there are about 20 other cases reported as WCCA, all of which have been diagnosed on histopathology, 2 of the cases had been found to be intra-thyroidal and only one has been diagnosed as water-clear cell carcinoma. No change in the management or the frequency of the follow up had been suggested.

**Conclusion**

WCCA is a rare cause of PHPT, however the diagnosis with WCCA doesn’t change the management of the parathyroid adenoma in terms of operation and the follow up plans.

**Y022**

## Real-world use of non-echoplanar diffusion weighted MRI imaging for detection and clinical decision-making in Graves' orbitopathy

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*Background*

The Clinical Activity Score (CAS) is often used in clinical practice to guide treatment decisions in Graves' orbitopathy (GO) but has limitations, particularly in its potential to evaluate posterior orbital disease. We have previously demonstrated that non-echoplanar DWI can be a useful adjunct to clinical assessment in GO and compares well to other standard MRI modalities.[1,2] The main objectives of this study were to i) correlate DWI imaging with CAS and ii) determine the clinical decisions and outcomes influenced by our radiological evaluation.

*Methods*

This was a retrospective observational study of 31/88 patients who had at least one DWI scan (60 in total) and corresponding CAS (same observer-VL) as part of routine clinical care in a multidisciplinary GO clinic from 2012 to 2017. For each scan, an experienced Head and Neck Radiologist (RL) derived an apparent diffusion coefficient (ADC) for each extra-ocular muscle (EOM). Spearman's rank correlation coefficient was used to determine the relationship between CAS and ADC. A Decision Tree was constructed to evaluate clinical decisions taken on the basis of DWI activity. Receiver-operator curves (ROC) were plotted for mild GO and dysthyroid optic neuropathy (DON).

*Results*

There was a significant positive correlation between CAS and ADC (n=368 EOMs) ($r_s$=0.403 CI 0.312-0.489, P<0.0001). In addition, ADC values were significantly higher in the CAS ≥3 group compared to the CAS <3 group, P<0.0001. Our Decision Tree identified a third 'intermediate' severity cohort where activity on DWI was particularly useful in making clinical decisions. ADC performed well as a diagnostic test in predicting DON (AUC 0.974 95% CI 0.93-1.0). An exploratory secondary analysis suggested that the right orbit was more commonly involved than the left with a predilection for the right inferior rectus and relative sparing of the lateral recti.

*Conclusions*

Non-echoplanar DWI correlates well with CAS in our patients and was a useful adjunct to CAS in making clinical decisions especially in patients with 'intermediate' severity GO. DWI may be useful in identifying patients at risk of DON and may be a useful research tool to test hypotheses regarding temporal and spatial patterns of disease activity in GO.

1. Lingam RK, Mundada P, Lee V. Novel use of non-echo-planar diffusion weighted MRI in monitoring disease activity and treatment response in active Grave's orbitopathy: An initial observational cohort study. *Orbit (Amsterdam, Netherlands).* 2018;37(5):325-330.

2. Ritchie AE, Lee V, Feeney C, Lingam RK. Using Nonechoplanar Diffusion-weighted MRI to Assess Treatment Response in Active Graves Orbitopathy: A Novel Approach with 2 Case Reports. *Ophthalmic plastic and reconstructive surgery.* 2016;32(3):e67-70.

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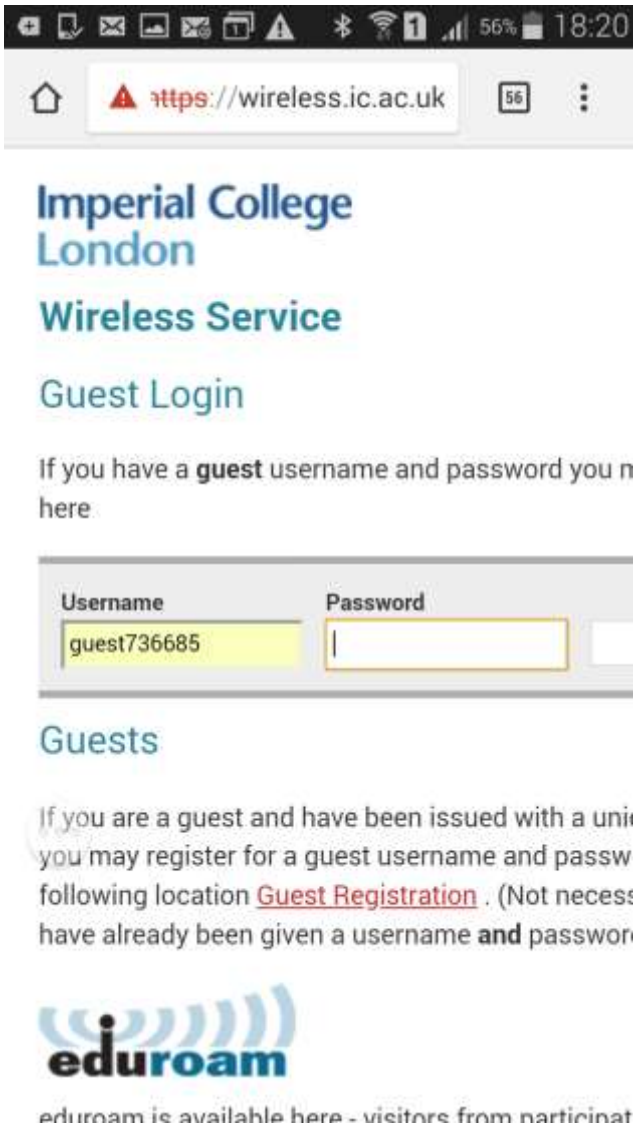


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