BRITISH SOCIETY OF NEURORADIOLOGISTS

British Society of Neuroradiologists Annual Scientific Meeting 2024

3rd-4th October

Marriot Royal Hotel, Bristol

Delegate Programme

General information

Registration desk: Open 08:00 - 18:00

Louise Richards will be available if you have any questions about proceedings.

WIFI access

Network: Marriot_conference Password: Bristolroyal2024

Meeting evaluation

Your feedback about the meeting is invaluable to BSNR and the speakers presenting. Please complete your evaluation survey online by the 15 October 2024. The survey link emailed to all delegates is also available via the meeting website: https://https://www.bsnr2024.com/evaluation.

CPD and certificates of attendance

The meeting is awarded 12 CPD self-certified points by the Royal College of Radiologists. An e-copy of your CPD Certificate will be emailed to you shortly after the meeting.

BSNR Black-Tie Dinner

Pre-booked tickets only

Dress code: Black-Tie

Coach from the Marriot Royal leaves 18:45 prompt.

Meet in the Foyer Lounge of the hotel (to the left of the hotel registration desk). Bring your dinner ticket with you (at the back of your delegate badge).

The trip will take 20-25 minutes.

Expect

- *Pre-Dinner Drinks with live music from 19:00.*
- *Dinner at 20:00.*
    - *After-Dinner Speaker, Dr Sian Williams.*
- *Followed by a disco.*

Return coach to the Marriot Royal leaves at 23:30 prompt.

Meet at the main entrance of the venue.

Prefer to drive ? Plenty of parking available.

BRITISH SOCIETY OF NEURORADIOLOGISTS

Address for driving or taxi bookings: Bristol Aero Collection Trust, Aerospace Bristol, Hayes Way, Patchway, Bristol, BS34 5BZ.

Welcome Address for the British Society of Neuroradiologists Annual Scientific Meeting 2024

It is with immense pleasure that we welcome you to the Annual Scientific Meeting of the British Society of Neuroradiologists here in the vibrant city of Bristol, famed for the Clifton Suspension Bridge and Banksy Street Art.

This year's conference features an exceptional line up of keynote speakers, renowned experts, and thought provoking research presentations, each contributing their expertise and insights to our collective knowledge. We are excited to delve into topics ranging from the Royal College of Radiologists' AI strategy, to medico-legal talks, genomics in oncology, outcome of neonates following cooling, to CT angiogram for diagnosing brain death, and hope to provide you with valuable insights and practical knowledge to integrate into your professional practice.

We extend a warm welcome to our Brian Kendall lecturer, Professor Emmanuel Houdart educating us on pulsatile tinnitus, and our James Bull lecturer, Professor Nick Fox, sharing his insights on the new era of dementia treatment and prevention.

We hope you are able to join us at our gala dinner at the Aerospace museum in Bristol, dining under the wings of the last ever Concorde to fly. We are fortunate and delighted to host Dr Sian Williams, journalist, TV presenter and psychologist, our VIP guest, who will be our after dinner speaker.

We extend our thanks to all of our sponsors, partners, and volunteers whose support has been instrumental in making the BSNR 2024 possible. We also thank Louise Richards for her immense organisation and event planning. The meeting would not have been possible without her.

We hope you find this meeting both professionally enriching and personally enjoyable.

Melissa Werndle, Joao Alves Rosa, Verka Beric, Marcus Bradley, Becky Hunt, Marcus Likeman, Paul Smith, Fionnan Williams

Bristol BSNR 2024 Organising committee

BRIAN KENDALL LECTURE 2024

Pulsatile tinnitus: diagnosis and treatment, about a recent series of 1228 cases

Professor **Emmanuel Houdart**
Head of Department of interventional neuroradiology, Lariboisière Hospital, Paris, France.
Professor of Neuroradiology, Université Paris VII.

Professor Emmanuel Houdart is Head of the Department of Neuroradiology of Lariboisière since 1997. Every year, the Unit carries out 800 cerebral angiography and 500 endovascular interventions in the brain, the spinal cord and the ENT area. The Unit of Lariboisière is one of the most experienced centres in France for interventional neuroradiology. In addition to usual interventions in INR, he carries out research to explore and treat new causes of pulsatile tinnitus and his recruitment is one of the largest in the world in this field.

JAMES BULL LECTURE 2024

Dementia: an update - entering a new era of treatment and prevention

Professor **Nick Fox**
Professor of Neurology. Neurodegenerative Diseases, University College London. Dementia Research Centre, Institute of Neurology, London.

Nick Fox is Professor of Clinical Neurology at UCL's Institute of Neurology and a consultant neurologist at the National Hospital for Neurology and Neurosurgery, Queen Square where he runs a specialist cognitive clinic. He has clinical and research interests in young onset and familial dementias and helped set up the first UK support groups for these disorders.

His research focus has been using on imaging and biomarkers for diagnosis and monitoring and to contribute to the search for effective therapies in dementia.

He has published over 500 peer reviewed papers and received a number of awards including the 2017 Weston Brain Institute International Outstanding Achievement Award, the 2018 Royal College of Physicians of Edinburgh Alexander Morison Medal and the 2022 Grand Prix Européen for Alzheimer's research.

British Society of Neuroradiologists Annual Scientific Meeting 2024
FACULTY

Mr **Neil Barua**, Consultant Neurosurgeon, Bristol

Dr **Jonathan Berg**, Consultant in Clinical Genetics and Senior Lecturer, Dundee

Dr **James Briggs**, Consultant in Intervention Radiology, Oxford

Dr **Lalani Carlton-Jones**, Consultant Neuroradiologist, London

Dr **Ela Chakkarapani**, Consultant Neonatal medicine, Associate Professor in Neonatal Neuroscience, Bristol

Professor **Rob Dineen**, Professor of Neuroradiology, Nottingham

Professor **Nick Fox**, Professor of Neurology, London

Dr **David Grimes**, Physicist and Science Writer, Dublin

Dr **Stephen Harden**, Vice-President of Clinical Radiology, Royal College of Radiology, Southampton

Ms **Katherine Holloway**, Regional Forensic Imaging Examiner, Imaging Hub, Devon and Cornwall Police, Exeter

Professor **Emmanuel Houdart**, Professor of Neuroradiology, Paris

Ms **Bryony Jones**, Regional Forensic Imaging Manager, Imaging Hub, Devon and Cornwall Police, Exeter

Professor **Kathreena Kurian**, Professor of Neuropathology, Bristol

Dr **Marcus Likeman**, Consultant Paediatric Neuroradiologist, Bristol

Dr **Kshitij Mankad**, Consultant Paediatric Neuroradiologist, London

Dr **Samantha Mills**, Consultant Neuroradiologist, Liverpool

Ms **Helen O'Hora**, Regional Forensic Imaging Examiner, Imaging Hub, Devon and Cornwall Police, Exeter

Dr **Daniel Scoffings**, Consultant Neuroradiologist, Cambridge

Mr **William Singleton**, Consultant Paediatric Neurosurgeon, Bristol

Professor **Stavros Stivaros**, Professor of Paediatric Neuroradiology, Manchester

Dr **Neil Stoodley**, Consultant Paediatric Neuroradiologist, Bristol

His Honour **Stephen Wildblood**, KC, Bristol

09:00 - 09:05	**Welcome**	Dr **Melissa Werndle**, *Bristol*
09:05 – 10:30	**SESSION ONE: NEUROONCOLOGY**	
	CHAIRS: Dr **Marcus Bradley**, Bristol & Dr **Owen Thomas**, Manchester	
09:05	**Awake craniotomy**	Mr **Neil Barua**, *Bristol*
09:30	**Equity in genomics**	Professor **Kathreena Kurian**, *Bristol*
10:00	Free paper (abstract 1) VASARI-auto: performant, equitable, efficient, economical, and survival-predictive featurization of glioma MRI	Dr **James Ruffle**, *London*
10:10	Free paper (abstract 2) MRI findings in a cohort of patients with Fabry disease: a 13-year experience from a tertiary referral centre	Dr **Amarit Gill**, *Sheffield*
10:20	Free paper (abstract 3) 3D FLAIR subtraction for the detection of new or enlarging multiple sclerosis lesions	Dr **Louis Tapper**, *Sheffield*

10:30 - COFFEE BREAK, POSTER VIEWING, EXHIBITION

11:00 – 12:45	**SESSION TWO: MEDICO-LEGAL**	
	CHAIRS: Dr **Samantha Mills**, Liverpool & Dr **Fionnan Williams**, Bristol	
11:00	**Trips and traps for doctors and medical experts in the family courts**	His Honour **Stephen Wildblood** KC, *Bristol*
11:30	**Behind the Scene: Forensic imaging**	Ms **Bryony Jones** Ms **Helen O'Hora** Ms **Katherine Holloway** *All Exeter*
12:00	**A lifetime in the witness box**	Dr **Neil Stoodley**, *Bristol* Professor **Stavros Stivaros**, *Manchester*
12:30	**Panel questions** Stavros Stivaros, Neil Stoodley, Stephen Wildblood	

12:45 - LUNCH, POSTER VIEWING, EXHIBITION

13:15 - 13:45 **PERSONAL PRACTICE SESSION** FUNCTIONAL NEURORADIOLOGY
Facilitator: Dr **Marcus Likeman**, Bristol

14:00 – 15:30	**SESSION THREE: INTERESTING CASES**	
	CHAIRS: Dr **Tom Campion**, London & Dr **Rebecca Hunt**, Bristol	
14:00	**Expert Panel:** Professor **Stavros Stivaros**, *Manchester* Dr **Samantha Mills**, *Liverpool* Dr **Daniel Scoffings**, *Cambridge*	**Facilitators:** Dr **William Brown**, *Bristol* Dr **Fraser Merchant**, *Bristol*
14:50	**The rise of medical misinformation - and what it means for clinicians and patients**	Dr **David Grimes**, *Dublin*

15:30 - COFFEE BREAK, POSTER VIEWING, EXHIBITION

16:00 – 16:50	**SESSION FOUR: BRIAN KENDALL LECTURE**	
	Pulsatile tinnitus: diagnosis and treatment, about a recent series of 1228 cases Professor **Emmanuel Houdart** Head of Department of interventional neuroradiology, Lariboisière Hospital, Paris, France. Professor of Neuroradiology, Université Paris VII. *Introduced by Dr **Dipayan Mitra**, Newcastle upon Tyne*	
16:50 – 18:00	**SESSION FOUR continued:**	
	CHAIRS: Dr **Dipayan Mitra**, Newcastle upon Tyne & Dr **Shelley Renowden**, Bristol	
16:50	Free paper (abstract 4) Utility of routine postoperative imaging in adults undergoing primary ventriculoperitoneal shunts	Dr **Adnan Alnaser**, *Salford*
17:00	**Results from the workforce survey**	Dr **Samantha Mills**, *Liverpool*
17:10	**Annual General Meeting**	*Kings Room, Members welcome*
		18:00 - CLOSE OF DAY 1
18:45	**Black-Tie Gala Dinner** Bristol Aero Collection Trust, Aerospace Bristol Coach pick-up @ 18:45 (congregate in the hotel foyer left hand side of the hotel reception desk). Coach return @ 23:30 (congregate at the entrance of the Centre).	

09:00 – 10:30	**SESSION FIVE: PAEDIATRICS**	
	CHAIRS: Dr **Ian Craven**, Leeds & Dr **Fionnan Williams**, Bristol	
09:00	**Paediatric neuromodulation in the connectomic era**	Mr **William Singleton**, *Bristol*
09:30	**Real world impact of neuroradiology in paediatric neurooncology practice**	Dr **Kshitij Mankad**, *London*
10:00	**Development at school-age following cooling for neonatal encephalopathy**	Dr **Ela Chakkarapani**, *Bristol*
		10:30 - COFFEE BREAK, POSTER VIEWING, EXHIBITION
11:00 – 12:50	**SESSION SIX: VASCULAR/INTERVENTION**	
	CHAIRS: Dr **Shelley Renowden**, Bristol & Dr **Joao Rosa**, Bristol	
11:00	**The genetics of AVMs**	Dr **Jonathan Berg**, *Dundee*
11:25	**The role of the neuroradiologist in SIH: Key updates**	Dr **Lalani Carlton Jones**, *London*
11:50	Free paper (abstract 5) Aneurysm treatment with the Contour Neurovascular System: a longitudinal, retrospective quantitative analysis	Dr **Rishabh Suvarna**, *Leeds*
12:00	**The role of CTA in brain death**	Professor **Rob Dineen**, *Nottingham*
12:30	Free paper (abstract 6) Image processing of split-dose same-day acetazolamide challenge SPECT for neurovascular disease	Dr **Heather Polydor**, *Bristol*
12:40	Free paper (abstract 7) Diagnostic utility of vessel wall MRI in the investigation of intracranial vasculitis	Dr **William Brown**, *Bristol*

12:50 - LUNCH, POSTER VIEWING, EXHIBITION

13:00 - 13:25	**GUERBET SPONSORED SYMPOSIUM** Innovation in MRI – Elucirem (Gadopiclenol): a novel macrocyclic, high-relaxivity, low-gadolinium dose GBCA Ms **Naki Adjirackor**, Guerbet, UK

14:00 – 14:50	**SESSION SEVEN: JAMES BULL LECTURE**	
	Dementia: an update - entering a new era of treatment and prevention Professor **Nick Fox** Professor of Neurology. Neurodegenerative Diseases, University College London. Dementia Research Centre, Institute of Neurology, London *Introduced by Professor **Stavros Stivaros**, Manchester*	
14:50 – 15:10	**SESSION SEVEN continued: NEURODEGENERATION**	
	CHAIRS: Dr **Marcus Bradley**, Bristol & Dr **Andrea Liu**, Cardiff	
14:50	Free paper (abstract 8) The association between neuroimaging-derived brain age and modifiable risk factors of dementia	Dr **Dewen Meng**, *Nottingham*
15:00	Free paper (abstract 9) Value of the putamen-to-caudate ratio in DaT scan for Parkinson's disease	Dr **Nirzer Mate**, *Bristol*
15:10 – 16:10	**SESSION EIGHT: ARTIFICIAL INTELLIGENCE**	
	CHAIRS: Dr **Tilak Das**, Cambridge & Dr **Paul Smith**, Bristol	
15:10	**Update on RCR AI strategy - how will it impact neuroradiology?**	Dr **Stephen Harden**, *London*
15:40	**Use of AI in hyperacute stroke**	Dr **James Briggs**, *Oxford*

16:10 - COFFEE BREAK, POSTER VIEWING, EXHIBITION

16:30 – 16:40	**Prize giving and closing remarks**
	16:40 - CLOSE OF DAY 2

BSNR SOCIETY MEETINGS *(invited persons only)*

Day/Time	Meeting	Location
Thursday 3rd October 08:00 – 09:00	Standards Subcommittee Meeting	York Room
	Academic Subcommittee Meeting	Hanover Room
	Training and Education Subcommittee Meeting	Windsor Room
Thursday 3rd October 10:00 – 11:00	BSNR Executive Meeting	Hanover Room

1 VASARI-auto: performant, equitable, efficient, economical, and survival-predictive featurization of glioma MRI

James Ruffle
Samia Mohinta, Kelly Pegoretti Baruteau, Rebekah Rajiah, Faith Lee, Sebastian Brandner, Parashkev Nachev, Harpreet Hyare.
National Hospital for Neurology and Neurosurgery, London, UK.

Background: The VASARI MRI feature set is a quantitative system designed to standardise glioma imaging descriptions. Though effective, deriving VASARI is time-consuming and seldom used clinically. This is a problem machine-learning could plausibly automate.

Methods: Using glioma data of 1172 patients, we developed VASARI-auto, an automated labelling software. In parallel, two consultant neuroradiologists independently quantified VASARI features in a randomly allocated subsample of 100 glioblastoma cases. We quantified: 1) agreement across neuroradiologists and VASARI-auto; 2) performance equity; 3) an economic workforce analysis; and 4) fidelity in predicting patient overall survival.

Results: Tumour segmentation was compatible with current state of the art (mean Dice coefficient 0.95), and equally performant regardless of age or sex. A modest inter-rater variability between in-house neuroradiologists (Cohen's Kappa 0.49) was comparable to between neuroradiologists and VASARI-auto (Cohen's Kappa 0.41), with far higher agreement between VASARI-auto methods (Cohen's Kappa 0.94). The time taken for neuroradiologists to derive VASARI was substantially higher than VASARI-auto (mean time per case 317 vs. 3 seconds, $p<0.0001$). A UK-wide analysis forecast that three years of VASARI featurization would demand 29,777 consultant neuroradiologist workforce hours (£1,574,935), reducible to 332 hours of computing time (and £146 of power) with VASARI-auto. The best-performing survival model utilised VASARI-auto features (R2 0.25), opposed to those derived by neuroradiologists (R2 0.21).

Conclusion: VASARI-auto is a highly efficient automated labelling system with equitable patient performance, a favourable economic profile for decision support, and non-inferior survival prediction. Future work should iterate upon and integrate such tools to enhance patient care.

2 MRI findings in a cohort of patients with Fabry disease: a 13-year experience from a tertiary referral centre

Amarit Gill[1]
Louis Tapper[1], Nataliya Pidlisnyuk[2], Nigel Lewis[1], Nigel Hoggard[1], Daniel Connolly[1].
1] Royal Hallamshire Hospital, Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield, UK. 2] University of Sheffield, Sheffield, UK.

Background: Fabry disease is a rare X-linked genetic disorder, causing multi-system lipid accumulation. Patients are predisposed to cerebrovascular disease, with increased risk of TIA/stroke. At our institution, the Fabry MRI head protocol was introduced in 2011, to screen for early ischaemic changes. The protocol includes axial PD/T2, volume FLAIR, sagittal T2, MRS, axial DWI/ADC, axial SWI, volume T1, MRA and axial T1 post gadolinium sequences.

Purpose: Review MRI head imaging findings in patients with Fabry disease, with a view to updating our Fabry MRI protocol.

Methods: 69 patients with Fabry disease were identified from a local registry. Data collected included genetic variant and age at baseline scan. Findings on each sequence of their MRI head imaging since diagnosis were retrospectively reviewed.

Results: 57/69 patients had MRI screening (mean age 46). 3/57 patients (5%, all <75 years old with p.N215S genetic variant) demonstrated abnormal Fazekas 2 graded white matter T2 hyperintensities. 52/57 had an MRA, of which 50/52 were normal (96%) 50/51 patients had normal post-contrast imaging (98%). The 3 patients with reported MRA and post-contrast abnormalities, were considered incidental, unrelated to disease process. 46 patients had spectroscopy, of which 100% were within acceptable limits for location.

Conclusion: The routine screening Fabry MRI protocol at our centre will be updated to include axial PD/T2, axial DWI/ADC and axial SWI only. This significantly reduces scanning time from approximately 60 minutes to 15 minutes. In turn, this increases MRI capacity, and improves patient experience by reducing appointment time and avoiding unnecessary cannulation.

3 3D FLAIR subtraction for the detection of new or enlarging multiple sclerosis lesions

Louis Tapper
David Paling, Andrew Martin, Nigel Hoggard, Peter Metherall.
Sheffield Teaching Hospitals, Sheffield, UK.

Background: International guidelines recommend people with multiple sclerosis (MS) on disease modifying therapies (DMT) should be monitored with 3D FLAIR MRI at least yearly, significantly increasing the radiology reporting burden. Around 25% of new MS lesions are missed, even by specialist MS neuroradiologists.

Objective: Assess if our subtraction software improves the detection of new or enlarging MS plaques on 3D FLAIR MRI.

Methods: 40 MRI scans performed for MS monitoring were identified from routine neurology clinic requests. Co-registered 3D FLAIR sequences from the current and prior comparator scans were subtracted and any difference highlighted in colour by the automated software pipeline (MIM Maestro, MIM Software Inc., OH, USA). Two expert reviewers were blinded to the outcome and reviewed the imaging with and without the subtraction software. A consensus was reached for any discrepancies between the reviewers.

Results: 18/40 scans showed interval disease progression in the consensus review. 100% of those scans originally reported (standard of care clinical report) as showing 'interval disease progression' were identified correctly by both reviewers (8/8). The other 10 cases which showed progressive disease, following the use of subtraction images, were originally reported as 'no interval disease progression'.

Conclusion: Almost a third of scans originally reported as 'no interval disease progression' actually showed radiological evidence of progressive disease when using the subtraction software. We believe that this automated technique can increase the accuracy with which new and enlarging MS lesions are detected without major resource implications. This could facilitate earlier optimisation of DMT.

4 Utility of routine postoperative imaging in adults undergoing primary ventriculoperitoneal shunts

Adnan Alnaser
Adnan R Alnaser, Abed Alnsour, Omar N Pathmanaban, Helen Maye, Catherine McMahon, Matthew Bailey, Mueez Waqar.
Geoffrey Jefferson Brain Research Centre, Northern Care Alliance NHS Foundation Trust, Salford, UK.

Background: There is currently no consensus on the usefulness of postoperative imaging after ventriculoperitoneal (VP) shunt insertion in adults. The aim of this study was to investigate the utility of routine postoperative imaging (CT head scans and radiographs) following primary VP shunt insertion in a general adult population treated at a tertiary neurosurgical centre.

Methods: Patients undergoing primary VP shunt insertion between 2017-2021 were included. Actions taken based on routine postoperative imaging and need for subsequent shunt revision were recorded.

Results: 246 patients were included, 237 had postoperative imaging. The median age was 63 years (range 17-90). There was a female preponderance (126/246, 51.2%). Acute intervention was employed in 9 patients (4%) on the basis of routine postoperative CT head scan. Routine postoperative radiographs did not result in reoperation. Around a quarter (27.628%) of patients had a shunt revision, most of whom underwent urgent primary shunt insertions. Postoperative ventricular catheter characteristics (position of shunt tip, tip relation to septum pellucidum, and intraventricular catheter distance) were not predictive of shunt revision. Surgical urgency (emergency vs. elective procedures) was associated with long-term shunt revision (OR = 2.49, 95% CI 1.29–4.79, p= 0.007).

Conclusions: Routine postoperative imaging rarely led to reoperation in adult patients undergoing primary VP shunt insertion. Patients undergoing emergency shunt insertions were at the highest risk for requiring revision.

5 Aneurysm treatment with the Contour Neurovascular System: a longitudinal, retrospective quantitative analysis of a single-centre experience

Rishabh Suvarna
Fathallah Islim, Nayyar Saleem, Tufail Patankar.
Leeds General Infirmary, Leeds, UK.

Background: Contour Neurovascular System is a novel intrasaccular flow diverter capable of treating a variety of intracranial aneurysms, particularly wide neck aneurysms. However, there is a lack of studies substantiating its long-term effectiveness and safety.

Objective: Investigate the 6-month, 2-year occlusion rate of aneurysms treated with Contour, and characterise its immediate and long-term complication rates.

Methods: Patient demographics were obtained including age, gender, smoking status, diabetes, hypertension. Aneurysm demographics included aneurysm size (width, height, dome-to-neck ratio (DNR), location, partial thrombosis status. Procedural data included Contour diameter, adjunct coiling and perioperative antiplatelets used. The efficacy endpoint data included immediate angiographic occlusion (O'Kelly Marotta Scale; OKM), 6-month, 2-year aneurysm status (modified Raymond-Roy criteria; mRRC) and retreatment rate. Statistical analysis was performed to study risk factors for inadequate aneurysm occlusion. Primary safety endpoint data included any post-operative or delayed complication and length of hospital stay.

Results: 51 aneurysms from February 2017-March 2022 were treated. 6-month, 2-year radiological follow-up were obtained in 46 and 42 patients respectively. 6-month and 2-year complete aneurysm occlusion (mRRC1) were 56.5% (26/46) and 61% (26/42). Adequate occlusion (mRRC1 and mRRC2) was 86.9% (40/46) at 6 months and 83.3% (35/42) at 2 years. 3 patients (5.8%) required retreatment. Transient post-operative symptoms occurred in 4/51 patients (7.8%). Long-term neurological morbidity occurred in 1/51 patients (1.9%; mRS 2). No device or operation-related mortality occurred.

Conclusion: Contour demonstrates good occlusion rates with long-term stability and high safety. Early aneurysm occlusion failure at 6 months requires close monitoring and may require further endovascular treatment.

6 Image processing of split-dose same-day acetazolamide challenge SPECT for neurovascular disease

Heather Polydor[1]
Marcus Bradley[2].
1] University Hospitals Bristol & Weston NHS Foundation Trust, Bristol, UK. 2] North Bristol NHS Foundation Trust, Bristol, UK.

Background: Acetazolamide challenge SPECT imaging with [99mTc]Tc-HMPAO is capable of providing images of a patients' cerebrovascular reserve when performed as a split-dose same-day procedure. This information is able to inform surgical strategies and aid in the assessment of surgical outcomes through comparison with follow-up imaging. Generating this cerebrovascular reserve image is complex, and so this project looked at setting up a standardised method using CE-marked software provided by Hermes Medical Solutions.

Method: With reference to published methods for split-dose same-day acetazolamide challenge SPECT, an image processing method was established to generate the required images (Hongyoon Choi et al. 2013, 47: 188-195. Nucl Med Mol Imaging.). The following images needed to be produced for this study:

- Baseline image
- Acetazolamide challenge image
- Cerebrovascular reserve image

The next task was to find a way to generate these images using the CE-marked software from Hermes Medical Solutions. This involved using the maths tool to manipulate and generate the required images whilst minimising image artefacts created using this technique. This processing was tested and validated to ensure the processing was generating the images required correctly.

Conclusion: Following the adoption of this new image processing method, we have performed over 20 patients' scans since 2021, with a number of previous studies requiring re-processing for surgical follow-up comparison. This same-day technique is particularly beneficial for paediatric patients who require sedation and those patients where cerebrovascular reserve images may aid in surgical planning.

7 Diagnostic utility of vessel wall MRI in the investigation of intracranial vasculitis

William Brown
Joao Alves Rosa, Paul Smith.
Southmead Hospital, Bristol, UK.

Background: Intracranial vessel wall imaging is an emergent MRI technique increasingly used in clinical practice to identify and characterise a broad range of intracranial vascular abnormalities. Assessment of inflammatory vasculitides is one such application, with concentric, long segment enhancement of the vessel wall the most frequently described feature in such cases. Here, we describe a single-centre case series in which we review the diagnostic utility of vessel wall MRI in the investigation of intracranial vasculitis.

Objectives: Review the frequency of radiologically apparent vessel wall abnormalities in patients being investigated for intracranial vasculitis following introduction of vessel wall MRI to a tertiary neurosciences centre, as well as describe the range of positive radiological findings.

Methods: Patients undergoing vessel wall imaging for suspected vasculitis between October 2022 and June 2024 were retrospectively identified using CRIS. All patients underwent a set vessel wall MRI protocol on a Philips Achieva 3T MRI scanner. Data was analysed using Microsoft Excel.

Results: 44 patients underwent vessel wall MRI imaging for suspected vasculitis. Of these, 8 patients (18%) were found to have areas of abnormal enhancement or vessel wall thickening. 4 patients (9%) had intracranial imaging findings felt to be consistent with an inflammatory vasculitic process, whilst 2 (5%) demonstrated vessel wall abnormalities suggestive of alternative pathologies. 2 further cases (5%) demonstrated findings of uncertain significance.

Conclusion: Vessel wall MRI imaging is a useful imaging tool that can help positively identify patterns of vessel wall enhancement to support or refute the diagnosis of an intracranial vasculitis.

8 The association between neuroimaging-derived brain age and modifiable risk factors of dementia

Dewen Meng[1]
Alireza Mohammadinezhad Kisomi[2], Christopher Tench[2], Stamatios Sotiropoulos[2], Dorothee Auer[2].
1] Nottingham University Hospitals NHS Trust, Nottingham, UK. 2] University of Nottingham, Nottingham, UK.

Background: 40% of dementia cases may be prevented or delayed by targeting twelve epidemiologically determined modifiable risk factors but the pathomechanistic link of these risk factors with dementia remain under researched. The brain age gap (BAG) quantifies the difference between predicted brain age and chronological age, and thus captures the combined impact of an individual's environmental and disease exposures, lifestyle choices, and genetic influences, expressed as deviations of brain age from normal trajectories.

Objectives: To explore the effects of these twelve risk factors on brain health which is measured by BAG.

Methods: Data from 1338 healthy participants of the UK Biobank cohort (UKBB) were analysed. Using tissue-specific (grey matter [GM] and white matter [WM]) models previously trained in an independent UKBB cohort, individual BAG was estimated. We then used stepwise discriminant function analysis and linear regression analysis approaches to investigate the effects of risk factors on tissue specific BAG.

Results: The combination of five risk factors (education, systolic blood pressure (BP), hearing impairment, air pollution and smoking) was significantly associated with a widening of the GM-based BAG ($r=0.429$, $p=0.004$) while four of these (systolic BP, air pollution, smoking and education) and BMI were significantly associated with WM-based BAG ($r=0.478$, $p<0.001$).

Conclusion: Some of the epidemiological risk factors of dementia may exert their detrimental effect on brain health through accelerated brain aging with four factors affecting both GM- and WM-based widening of BAG indicative of neurodegeneration and vascular/inflammatory white matter changes.

9 Value of the putamen-to-caudate ratio in DaT scan for Parkinson's disease

Nirzer Mate
Savindika Nawarathna, Akshay Easwaran, Randeep Kulshrestha.
University Hospitals Bristol and Weston NHS Foundations Trust, Bristol, UK.

Background: Dopamine transporter imaging (DaTscan) is a crucial diagnostic tool for Parkinson's disease. The putamen-to-caudate ratio (PCR) has been proposed as a potential indicator for Parkinson's disease diagnosis.

Objective: To evaluate the correlation between PCRs and the diagnosis of Parkinson's disease, with an abnormal PCR defined as <0.8.

Methods: A retrospective study was conducted using hospital databases to identify DaT scans performed from April 2023 to January 2024, totalling 49 scans. Patient records were reviewed to confirm diagnoses and relevant histories of Parkinson's disease or Parkinson-plus syndromes. PCRs were recorded, and their correlation with confirmed Parkinson's disease diagnoses was assessed.

Results: Of the 49 scans, 8 did not have PCRs calculated or mentioned in the final reports. Among the remaining 41 scans, 29 (70.73%) exhibited bilateral PCRs, >0.8, and 9 (18.36%) had unilateral PCRs >0.8. In total, 38 cases (77.55%) showed PCRs >0.8, while 3 cases presented bilateral PCRs <0.8.

Conclusion: PCRs alone are not a definitive method for diagnosing Parkinson's disease and Parkinson Plus syndromes. It demonstrates weak correlation with the disease process. However, they can serve as a valuable quantitative tool when used in conjunction with existing diagnostic guidelines and interpretations.

Abstract Posters

Posters in the **Kings Room**.	
P1	**Central nervous system complications of granulomatosis with polyangiitis** **Tabassum Dungarwalla**, *Cambridge University Hospitals NHS Foundation Trust, Cambridge, UK.*
P2	**Microbiological yield rate of image-guided needle biopsy for infectious discitis** **Raunak Rao**, *Cambridge University Hospitals NHS Foundation Trust, Cambridge, UK.*
P3	**Audit to evaluate the use of low dose CT head protocols at Alder Hey Children's Hospital** **Gedeon Lemma**, *Alder Hey Children's Hospital, Liverpool, UK.*
P4	**A rapid probability calculator for glioma IDH genotyping: diagnostic gain for rater in-training** **Nitin Menon**, *Nottingham University Hospitals NHS Trust, Nottingham, UK.*
P5	**Spheno-orbital meningioma: a manifestation of 'pseudo- optic neuritis,** **Asif Ajmal Ameer Khan**, *Colchester General Hospital, East Suffolk and North Essex NHS Trust, Colchester, UK.*
P6	**Extensive leptomeningeal metastasis ("zuckerguss" presentation) in a case of malignant melanoma** **Shreekar Roddam**, *Swansea Bay University Health Board, Port Talbot, UK.*
P7	**Metronidazole-related neurotoxicity** **Shreekar Roddam**, *Swansea Bay University Health Board, Port Talbot, UK.*
P8	**Abnormal glucose metabolism and the adult brain** **Sindhu John**, *Changi General Hospital, Singapore, Republic of Singapore.*
P9	**Mechanical birth trauma CNS injury patterns** **Ian Russell**, *Royal Manchester Children's Hospital, Manchester, UK.*
P10	**Cerebellar neonatal subpial haemorrhage – under recognised type** **Saad Moughal**, *Royal Manchester Children's Hospital, Manchester, UK.*
P11	**Audit to assess the diagnostic accuracy of Brainomix AI software and time taken to publication of radiologist's formal report** **Sarthak Bahl**, *Gloucestershire Hospitals NHS Foundation Trust, Gloucester, UK.*
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P1 Central nervous system complications of granulomatosis with polyangiitis

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Background: Hypertrophic pachymeningitis is a condition where there is dural thickening which may be idiopathic, infectious or inflammatory. Clinically, patients usually present with cranial nerve palsies or headaches. Granulomatosis with polyangiitis (GPA) is a multisystem granulomatous disease associated with anti-neutrophil cytoplasmic antibodies (ANCA). Central nervous system (CNS) involvement is rare and manifests as vasculitis affecting small-medium sized vessels of the brain or spinal cord, invasion of a granulomatous mass from an extracranial site or isolated involvement of the meninges.

Case presentations: We present a case of a 42-year-old female with a history of cocaine use who had hard palate perforation, sinus destruction and pyoderma gangrenosum with ANCA seropositivity. She had an MRI performed due to intermittent headaches which demonstrated cortical and subcortical oedema involving multiple cerebral lobes with diffuse sulcal high FLAIR signal. Postcontrast imaging showed diffuse irregular pachymeningeal and leptomeningeal enhancement with focal areas of diffusion restriction. Given the diagnostic uncertainty, a brain biopsy was performed which confirmed a chronic granulomatous process suggestive of GPA.

A second case of a 62-year-old male who presented with right-sided headaches and visual disturbances was found to have diffuse pachymeningeal thickening and enhancement, particularly around the skull base on MRI. He was also noted to have a positive ANCA titre which, together with the imaging findings, was most suggestive of GPA.

Conclusion: MRI appearances of hypertrophic pachymeningitis in vasculitis can be varied and non-specific, however, in the context of ANCA seropositivity, particular consideration should be given to meningeal involvement as a rare but important complication of GPA.

P2 Microbiological yield rate of image-guided needle biopsy for infectious discitis

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Background: The positive culture rate for spinal biopsy performed in patients with suspected discitis in the literature varies from 31% to 91%. Meta-analysis reports an overall culture positivity rate of 48% (McNamara et al 2017, AJNR). Analysis of our institutional yield rate in 52 patients between October 2014 and December 2019 showed 23.1%.

Objective: The aim of this study was to determine the rate of positive culture for CT-guided biopsies performed at our centre from January 2020 to December 2023, and to explore factors that may predict diagnostic yield.

Methods: We retrospectively reviewed the medical records of 29 patients with suspected infective discitis who were referred for CT-guided spinal biopsy between January 2020 and December 2023. All biopsies were performed by a neuroradiologist. Data were collected on the patient's symptoms, the white cell count and CRP at presentation, whether antibiotic therapy was given prior to biopsy, the biopsy kit, the approach (extrapedicular or transpedicular), the nature of the samples obtained, and whether an organism was identified from the biopsy sample.

Results: Of 29 biopsies performed in 29 patients, 13 (44.8%) biopsy specimens yielded an organism, either through positive culture or PCR. In 9 out of 13 positive biopsies, the specimen had disc material.

Conclusions: Our analysis showed 44.8% yield in patients who underwent biopsy for suspected discitis. Our results are consistent with recently published data which showed a higher positive tissue culture rate in patients with disc biopsy than bone biopsy.

P3 Audit to evaluate the use of low dose CT head protocols at Alder Hey Children's Hospital

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Background: Paediatric patients with hydrocephalus and CSF shunt malfunction require frequent CT scans, leading to a high lifetime risk of radiation-associated malignancy. Low dose CT protocols offer effective dose reduction while ensuring accurate assessment of ventricular size and shunt position.

Objective: The audit aimed to evaluate the protocoling of low dose CT to assess ventricular size and CSF shunt malfunction, with standards of 100%, at a UK tertiary children's hospital.

Methods: Patients under 18 years undergoing CT head scans primarily for assessing ventricular size and shunt malfunction were included. Data were retrospectively collected over 12 months (April 2023-2024) via PACS, including age, mA value, dose length product, and clinical history. Low versus standard CT dose was determined by fixed and variable mA values set by local department.

Results: Of 1117 CT head scans, 317 met the inclusion criteria, with 163 receiving low dose and 154 receiving standard dose CT. Average dose reduction was up to 97% in patients under 1 year of age. Appropriate use of low dose CT protocol was 89% for assessing ventricular size and shunt malfunction. The proportion of all cases that received higher CT doses than necessary for this indication was 14.2%.

Conclusion: Low dose CT protocols effectively reduce radiation exposure in children while maintaining diagnostic accuracy for ventricular size and shunt assessment. Despite good use of low dose CT, there remains areas for improvement in the appropriate use of standard CT to minimise unnecessary radiation and enhance patient safety.

P4 A rapid probability calculator for glioma IDH genotyping: diagnostic gain for rater in-training

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Background: Glioblastoma (GBM) is a lethal neoplasm characterised by isocitrate dehydrogenase-wildtype (IDHwt) genetics and WHO grade 4 histology. IDH-mutant (IDHmut) gliomas are mostly lower grade (WHO 2-3) IDHmut/1p19qintact astrocytoma and IDHmut/1p19qcodel oligodendroglioma. MRI appearances of early GBM stages may overlap with IDHmut gliomas, for example by lacking contrast enhancement. Rapid diagnosis is needed as complete resection improves survival. We previously developed multivariable models for IDH genotype prediction, applicable as a calculator (Microsoft Excel) within minutes.

Objective: To test the IDHwt probability calculator using data from a new tertiary centre.

Methods: Consecutive MRI images of diffuse glioma patients (01-09/2023) were analysed by two blinded observers. ADC values, tumour location, enhancement pattern, presence of cysts, and age were recorded. Regions of interest were drawn in the largest solid tumour cross-section (ADCmean) and normal centrum semiovale white matter (ADCNAWM) to generate relative ADC values (rADCmean). IDH probability calculator results were compared to final tissue data .

Results: The study included 108 patients (mean age 56.86±15.51), with 85 IDHwt, 15 IDHmut/1p19qintact, and 8 IDHmut/1p19qcodel gliomas. The model correctly classified IDHwt status in 105 of 108 gliomas with 98.82% sensitivity, 91.30% specificity, and an AUC of 0.97 for a specialist. For an untrained rater, sensitivity was 96.5%, specificity 73.9%, and AUC 0.92. The calculator increased sensitivity over visual estimates for trainees, including new identification of WHO grade 2-3 IDHwt glioblastoma stages. ADC measurements (ICC 0.86-0.98) and visual criteria (kappa 0.76-0.9) were reproducible.

Conclusion: A rapid probability calculator predicts IDHwt GBM across WHO grades 2-4, usable even by trainees. The method is easy to apply with any hospital PACS system, requiring no software installation.

P5 Spheno-orbital meningioma: A manifestation of 'pseudo- optic neuritis'

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Case report: A 34-year-old female presents to the eye clinic following 1 month history of sudden loss of vision in the right eye. Patient denies eye pain or headache. Initial examination highlights visual acuity of 3/60 in the right eye and 6/6 in the left eye; best corrected. Stable maculas of both eyes but a pale right eye optic disc seen. MRI Brain with contrast requested on clinical suspicion of atypical optic neuritis.
The MRI reveals a broad based extra-axial mass with dural extension arising from right lesser wing of sphenoid. Post-contrast imaging shows homogeneous avid lesional enhancement and mass invasion into the suprasellar cistern, pituitary fossa, and right orbit. The mass exhibits encasement and luminal narrowing of cavernous and supraclinoid segments of right ICA and encasement of right optic nerve origin. Hyperostosis of the right lesser wing of the sphenoid is present. Widening of the right superior orbital fissure where the lesion invades into the lateral extraconal space of the right orbit. There is fluid at the right intra-orbital optic nerve sheath but no enhancement of the optic nerve. Diffusion weighted imaging showed restricted diffusion at the right optic nerve consistent with acute ischaemic neuropathy secondary to compression. No evidence of demyelination or optic neuritis. Urgent referral to neuro-oncology / ophthalmology MDT for further management.

Background: A spheno-orbital meningioma (SOM) is an infrequent type of meningioma originating from the sphenoid wing and extending into the periorbital region. It represents a small percentage, typically ranging from 2% to 9%, of all meningiomas found within the skull. The clinical features of SOM result from these intraosseous, intradural, and intra-orbital lesions and include a triad of symptoms, in descending order of frequency: proptosis, visual impairment, and ocular motility defects. The treatment for symptomatic or progressing tumours involves their surgical removal.

Learning points: SOMs are identified as secondary orbital tumours emerging from the dura mater of the sphenoid wing bone. The development process of intraosseous meningioma lacks clarity. The distinctive imaging traits of SOMs involve a blend of bony hyperostosis and orbital extension, aiding in their distinction from both sphenoid wing meningiomas and orbital meningiomas.

P6 Extensive leptomeningeal metastasis ("zuckerguss" presentation) in a case of malignant melanoma

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Background: Leptomeningeal metastasis (LM) is a severe and often late complication of malignant melanoma, characterised by the dissemination of cancer cells within the cerebrospinal fluid. The "zuckerguss" pattern, resembling sugar icing, represents extensive LM and is a rare but critical diagnostic finding.

Objective: This case report aims to describe the clinical presentation, imaging findings, and management of extensive LM with a "zuckerguss" pattern in a patient with malignant melanoma of the upper arm, emphasising the role of advanced neuroradiological techniques in diagnosis.

Methods: A 53-year-old female with a history of worsening lower back pain over 4-6 weeks, occasional nausea and vomiting, especially in the morning, presented with decreased mobility and bilateral leg weakness, more pronounced in the right leg. The patient had a prior history of stage 1b (T2a N0 M0) melanoma of the left upper arm, which was excised 9 years ago. Initial magnetic resonance imaging (MRI) of the brain and spine, including contrast-enhanced T1-weighted imaging, was performed. Additionally, CT thorax, abdomen, and pelvis (TAP) were performed.

Results: MRI revealed diffuse leptomeningeal enhancement in the brain and spinal cord, exhibiting the characteristic "zuckerguss" pattern. CT TAP revealed extensive lung, peritoneal, and retroperitoneal nodules. The biopsy of the epigastric nodule confirmed metastatic melanoma. The imaging findings, combined with the clinical presentation and biopsy results, confirmed the diagnosis of extensive LM. The patient was started on palliative radiotherapy. Despite aggressive treatment, the patient's neurological condition deteriorated, highlighting the poor prognosis associated with extensive LM.

Conclusion: This case underscores the importance of recognising the "zuckerguss" pattern of LM in patients with malignant melanoma, as early and accurate diagnosis is crucial for managing symptoms and improving quality of life. Advanced MRI techniques play a pivotal role in detecting such extensive metastatic disease. Further research is needed to explore effective therapeutic strategies for this challenging condition.

P7 Metronidazole-related neurotoxicity

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Background: Metronidazole, an antibiotic effective against anaerobic bacteria and protozoa, is associated with neurotoxicity, particularly affecting the cerebellum, after prolonged use. This adverse effect, though rare, necessitates vigilance in clinical practice.

Objective: This case report aims to delineate the clinical presentation, imaging findings, and management of metronidazole-related cerebellar neurotoxicity in a 75-year-old male with a history of E. coli bacteraemia and liver abscess, treated with intravenous metronidazole for 5-6 weeks, who subsequently presented with grand mal seizures.

Methods: The patient presented with sudden onset grand mal seizures following completion of a 5–6-week course of intravenous metronidazole for E. coli bacteraemia and liver abscess. Neurological examination revealed signs of cerebellar dysfunction. Magnetic resonance imaging (MRI) of the brain, including T2-weighted and FLAIR sequences, was performed to investigate the aetiology of seizures and neurological deficits.

Results: MRI demonstrated bilateral hyperintense lesions in the cerebellar dentate nuclei, consistent with metronidazole-induced neurotoxicity. Discontinuation of metronidazole was promptly initiated, and antiepileptic therapy was commenced to manage seizures. The patient's clinical condition improved significantly with cessation of seizures and resolution of cerebellar signs.

Conclusion: This case highlights the critical importance of recognizing metronidazole-induced neurotoxicity, particularly in elderly patients receiving prolonged treatment. Early identification through characteristic MRI findings and prompt discontinuation of metronidazole are essential to mitigate neurological sequelae. Clinicians should maintain vigilance for this rare yet potentially debilitating complication of metronidazole therapy.

P8 Abnormal glucose metabolism and the adult brain

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Background: The brain is an avid consumer of glucose, accounting for up to 80% of the total body glucose utilisation but can neither generate nor store glucose. It is hence exquisitely sensitive to disturbances in blood glucose levels which in a very short interval can cause significant abnormalities in neuronal metabolism. This acute presentation can mimic acute stroke. Specific imaging findings can help differentiate the two.

Objective: To review the neuroimaging findings associated with abnormal blood glucose levels in adult patients.

Methods: We review specific neuroimaging patterns of hypoglycaemia and hyperglycaemia that we have encountered in adult patients and highlight their differential diagnoses.

Results: Our cases include typical and atypical presentations of nonketotic hyperglycaemia such as diabetic striatopathy, which typically presents with chorea and hemiballismus, while the less common findings include subcortical white matter T2 hypointensity and susceptibility in patients with occipital symptoms. Additionally, we present the classical MRI appearances of hypoglycaemic encephalopathy and its outcome. We contrast these findings with the MRI findings of chronic hepatic encephalopathy that can mimic diabetic striatopathy. We also outline several imaging differentials for hypoglycaemic encephalopathy such as hypoxic ischemic encephalopathy, Creutzfeldt-Jakob disease, heat stroke etc, all of which exhibit similar patterns of restricted diffusion on MRI.

Conclusion: Acute disturbances in glucose metabolism can clinically resemble more severe conditions like stroke. Early recognition and diagnosis are crucial for timely management, making it necessary to be familiar with the typical imaging patterns and their differential diagnoses to ensure prompt and accurate patient care.

P9 Mechanical birth trauma CNS injury patterns

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Background: Assisted delivery devices significantly increase the risk of central nervous system (CNS) injuries and can be a cause of significant morbidity and mortality with potential for lifelong disability. There are very few studies published on mechanical birth trauma related CNS injuries and associated complications.

We aim to evaluate CNS injuries that occurred in the perinatal period where assisted delivery devices were used during delivery. This is a retrospective study from a tertiary paediatric centre on cases that presented from 2011 to 2024. CNS birth trauma related to the use of forceps, ventouse extraction and foetal pillow device were included in the study. The cranial, intracranial, and spinal injuries that were identified on CT scan/MRI were included, the extracranial injuries (scalp and skeletal) were excluded. The most common cranial injury pattern identified was that of a 'ping-pong' fracture (depressed skull fracture) mainly involving the parietal bones and the most common intracranial pattern was that of intracranial haemorrhage; subdural haemorrhage being the most common subtype.

The CNS injuries due to mechanical birth trauma have distinct imaging features, particularly on computed tomography (CT) and magnetic resonance imaging (MRI). We aim to demonstrate these key imaging findings and highlight the particular injury patterns with specific delivery devices.

P10 Cerebellar neonatal subpial haemorrhage – under recognised type

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Background: Cerebral neonatal subpial haemorrhage (SPH) is well recognised. Cerebellar SPH was rarely reported.

Objective: To identify cerebellar SPH cases, and if its imaging features, evolution, aetiology resembles cerebral SPH.

Methods: We searched RMCH PACS for neonatal MRIs brain January 2020 - May 2024 for terms SPH, posterior fossa haemorrhage, cortico-subcortical infarction. Data collected included age, risk factors, cortico-subcortical infarction, consequences on imaging follow-up.

Results: Scans were performed within first month of life (mean 16, median 18, range 6-25 days). 41 cases with posterior fossa haemorrhage were identified. Of these, eleven neonates had cerebellar SPH (26.8%). Neonates with cerebellar SPH had concurrent haemorrhage. Incidence of concurrent infratentorial SDH was 63.6%, 18.2% for SAH, 9% for IPH. Concurrent supratentorial SPH was found in 27.3%. Six neonates had cerebellar venous cortico-subcortical infarction (55.5%). Eight neonates were preterm, three of them had HIE. Two of these were complicated by anaemia, one had sepsis. Of three term neonates, one had haemophilia, two HIE. Overall, four neonates had assisted traumatic delivery. Five neonates had CSF flow diversion for hydrocephalus. SPH splayed cerebellar folia and persisted up to 15 months. The pitfalls included confusion with SAH, SDH and SPH. The most commonly suggested aetiology was vascular malformation but was not confirmed on neurovascular imaging. Initially suspected haemorrhagic tumour in one neonate was subsequently excluded.

Conclusion: Cerebellar SPH accounted for quarter of neonatal posterior fossa haemorrhage, was complicated with venous cortico-subcortical infarction in half the cases. Risk factors, imaging and evolving patterns were similar to neonatal cerebral SPH.

P11 Audit to assess the diagnostic accuracy of Brainomix AI software and time taken to publication of radiologist's formal report

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Background: Artificial intelligence (AI) software is increasingly applied in diagnostic imaging, including stroke. However, the performance of AI algorithms in individual clinical settings may vary and should be locally validated and monitored.
In our institution, Brainomix eCTA AI software has been deployed to aid in detection of proximal arterial occlusions of the anterior circulation in the context of hyperacute stroke.

Objective: To assess the diagnostic accuracy of Brainomix AI software and time taken to publication of radiologist's formal report.

Methods: Retrospective analysis was performed for 59 consecutive patients who presented with acute stroke symptoms and who underwent both CT Head and CT angiography. Eligibility and reference standard were identified from the PACS record, referral information and electronic patient record, including subsequent imaging and MDT discussion. Patient age, time to published report, identification of arterial occlusion and final diagnosis were recorded.

Results: 1 patient was excluded due to imaging quality. 11 posterior circulation arterial occlusions were excluded from further analysis.
In detection of anterior circulation arterial occlusion, eCTA returned 2 false positive and 7 false negative outputs. Diagnostic parameters: PPV = 8/10 = 0.8 NPV = 30/38 = 0.79, Specificity = 30/32 = 0.94, Sensitivity = 8/15 = 0.53, Accuracy = 38/47 = 0.81.
Majority of radiologists' reports (55.33%) were issued within 1 hour of imaging and 88% were reported within 2 hours.

Conclusion: Limited by sample size. Sensitivity of eCTA fell below that of some reports. Accuracy and other performance indicators were similar to previous reports.

P12 Posterior cranial fossa cystic malformations

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Background: Posterior cranial fossa cystic malformations encompass a spectrum of developmental anomalies that affect the hindbrain's structural integrity, with significant implications for paediatric neurodevelopment. These include:

- Mega cisterna magna (MCM)
- Arachnoid cysts (AC)
- Blake's pouch cysts (BPC)
- Isolated inferior vermian hypoplasia (previously known as Dandy-Walker variant)
- Classic Dandy-Walker malformation

Objective: We aim to highlight key distinguishing imaging features of these malformations and simplifying imaging interpretation using a novel flow chart.

Methods: Evaluating current literature and up-to-date criteria enabled us to create an original flow chart that facilitates image interpretation. Additionally, providing objective definitions to recognise vermian hypoplasia, posterior fossa and 4th ventricle expansion to assist decision making at each step.

Results: The initial assessment is to evaluate for vermis hypoplasia (rounding of the fastigial recess and absence of the primary fissure). If there is, then the suggested diagnosis would be Dandy-Walker (classical or variant). If there are features of posterior fossa expansion (e.g. torcular-lambdoid inversion) then the classical type would be preferential.
If there are no features of vermis hypoplasia, then assessment for 4th ventricle expansion is required. If present, BPC is considered, and if not then MCM or AC. The latter two are differentiated by assessing for compressive effects on the vermis/cerebellum, usually present in AC and lacking with MCM.

Conclusion: Recognising the imaging features of the various posterior fossa malformations is vital for accurate diagnoses. This can have a substantial effect on the patient's management and prognosis.

P13 Diverse MRI patterns in non-ketotic hyperglycaemia

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Background: Hyperglycaemia can have varied clinical presentation from hemichorea-hemiballismus of diabetic striatopathy to seizures associated with hyperosmolar hyperglycaemic states. Acute manifestation of hyperglycaemia is clinically evident as hyperosmolarity and absence of ketonaemia or ketonuria. Radiological appearances are also variable. Non ketotic hyperglycaemia may present on MRI as asymmetrical T1W hyperintensity involving the basal ganglia (corpus striatum) also called diabetic striatopathy with hemichorea-hemiballismus to the contralateral side of the lesion. Non ketotic hyperglycaemia can also present on MRI with subcortical white matter hypointensity in parieto-occipital region often associated with cortical diffusion restriction. Patients often present with visual symptoms such as blurring, field defects, and hallucinations. MRI plays a role in defining extent of hyperglycaemia induced neurological changes and prognosticate recovery.

Objective: We present a series of four different cases of non-ketotic hyperglycaemia with different clinical and radiological appearances.

Conclusion: It is important to recognise these imaging patterns with appropriate clinical context, to avoid misdiagnosis of these patterns as infarctions or postictal changes. In addition, it may facilitate to assess the extent of neurological involvement and predict post treatment recovery.

P14 Unusual/subtle imaging findings in neurodegenerative disease

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Background: Imaging findings in patients with suspected neurodegenerative conditions are often subtle and equivocal but can be valuable in pointing clinicians towards a specific diagnosis, especially if clinical signs and symptoms are equivocal.

Objective: We present four cases of neurodegenerative diseases that presented at our institution with subtle and/or unusual imaging findings:

- Neurodegeneration with brain iron accumulation (NBIA) represents a heterogenous group of disorders, typically presenting with movement abnormalities. We present a patient who demonstrated hypointensity in the substantia nigra on susceptibility-weighted MRI (SWI) suggestive of NBIA and discuss the typical imaging findings.
- Multiple system atrophy is a Parkinson-plus syndrome that has three clinical subtypes according to disease phenotype. In MSA-C cerebellar involvement is predominant. We present findings of cerebellar hemispheric and cerebellar peduncle atrophy and a subtle “hot-cross bun” appearance in the pons suggestive of MSA-C.
- Creutzfeldt-Jakob disease (CJD) is a rapidly progressive prion disease. We present a case of sporadic CJD which on initial MRI demonstrated subtle T2-hyperintensity in the caudate and anterior putamen, with more marked abnormality as well as “cortical-ribboning” on a subsequent study.
- Alexander disease is a progressive fatal leukodystrophy whose adult-onset form presents with slowly progressive bulbar or pseudobulbar palsy and autonomic dysfunction. We present a case which demonstrated specific MRI findings in the form of abnormal T2-hyperintensity and focal atrophy in the medulla and cervicomedullary junction resulting in a characteristic tadpole configuration of the brainstem.

P15 Evaluation of Brainomix e-Stroke in clinical practice

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Background: Brainomix e-Stroke and e-CTA are AI-based decision support tools that can identify acute ischaemia in the middle cerebral artery (MCA) territory on non-contrast CT head, estimate the ASPECTS score, identify hyperdense vessels and hyperdense haemorrhage, and identify thrombosis on CT angiogram (CT-A) – all potentially useful in quickly selecting candidates for mechanical thrombectomy.

Objective: Assess performance of Brainomix e-Stroke v Consultant Neuroradiologist in identifying evidence of acute ischaemia on non-contrast CT head, evaluating ASPECTS score, identifying acute haemorrhage and hyperdense vessels, and MCA occlusion on CT-A.

Methods: Retrospective analysis of 100 CT heads and 35 CT-A. Comparison made between Consultant Neuroradiologist and Brainomix evaluation of ASPECTS, presence/location of hyperdense vessel, presence/location of haemorrhage, and presence/location of thrombus on CT-A.

Results: 98 CT heads included in the analysis. Statistically significant correlation (Pearson's r=0.89, p=2x10-34) between Neuroradiologist and e-Stroke ASPECTS scores. However, Neuroradiologist identified acute ischaemia on 7/98 CT heads, but e-Stroke only correctly identified 5 of these. e-Stroke overcalled acute ischaemia on 10/98 scans. e-Stroke has high specificity (90%), negative predictive value (NPV=98%) and accuracy (89%) for identification of acute ischaemia, but lower sensitivity (71%) and positive predictive value (PPV=36%).

e-Stroke identified only 2/5 hyperdense vessels, with an additional 9 false positives. e-Stroke accurately identified one out of two cases of subdural haemorrhage.

9/28 CT-A demonstrated thrombus, all of which were correctly identified by e-Stroke, with an additional 5 false positives, yielding a sensitivity of 100%, PPV=64%. NPV=100%, Specificity=74% and Accuracy=82%.

Conclusion: Brainomix software is potentially useful to quickly identify thrombectomy candidates if immediate Radiologist evaluation is not available. However, it is not sensitive enough to be relied upon in isolation, and a high number of false positives could yield many unnecessary referrals to thrombectomy services.

P16 Myelopathy or mimic? Imaging findings and unusual causes

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Background: Myelopathy encompasses a broad differential diagnosis including compressive and non-compressive aetiologies which often have non-specific imaging findings and hence pose a diagnostic conundrum.

Demyelinating disorders are the commonest cause of non-compressive myelopathy and can present with certain supraspinal findings to favour a particular diagnosis. E.g. involvement of the optic chiasm, periaqueductal grey matter, and area postrema along with longitudinally extensive transverse myelitis (LETM) in neuromyelitis optica spectrum disorder.

MRI plays a critical diagnostic role and establishing the length of a cord lesion and cross-sectional involvement further narrows the differential considerations. E.g Dorsal column involvement in subacute degeneration of the cord.

Compressive myelopathy secondary to spinal degeneration is a common mimic which is important to exclude and can enhance, posing a diagnostic challenge.

Paraneoplastic myelitis is an uncommon mimic and is a differential consideration of LETM with characteristic involvement of the lateral columns and can be a first presentation of a primary bronchogenic malignancy.

Dural arterio-venous fistula (dAVF) is the commonest vascular malformation of the spinal cord which manifests as T2 hyperintensity in the conus due to orthostatic cord oedema.

Objective: To present a case series of patients with myelopathies of varying aetiology. To review pertinent MRI findings that helped to clinch the diagnosis.

A pictorial review of pathologies depicting the length and cross-sectional cord involvement.

Conclusion: Diagnosing specific myelopathies and differentiating it from common mimics remains a radiological challenge however there are certain key MRI findings that support one diagnosis over another as described in this study.

P17 Visual aide memoir for reporting common neuroradiology investigations

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Introduction: Medical imaging has a continuously evolving key role in delivering health care. The reporting standards published by the Royal College of Radiologists stated that reports should provide an accurate interpretation of images to guide appropriate diagnosis and management. There are a number of tools that can be utilised to guide accurate interpretation of neuroradiological examinations. With a continuously increasing workload, it can be challenging to recall the multitude of various visual grading systems and therefore the authors propose a simple poster aide memoir designed for the radiology reporting room that can be a helpful tool to improve reporting accuracy and standardisation.

Objective: To provide a visual aide memoir to support radiologists in the reporting room in providing accurate and standardised reports.

Method: A review of the neuroradiology literature has been performed. In conjunction with discussion amongst the consultant diagnostic neuroradiologists within the department, several systems, schematics and visual prompts were identified which considered to be of value in diagnosis and reporting of pathologies including normal pressure hydrocephalus, occlusion of aneurysms (Modified Raymond-Roy classification), dementia (MTA score), small vessel disease (Fazekas score), degenerative disc disease, and ASPECTS (including posterior fossa circulation). These were collated to form a single poster.

Conclusion: A single comprehensive visual neuroradiological aide memoir has been designed to be displayed in radiology reporting rooms. Future work is required to determine the value of this as a visual reporting tool.

P18 Clinical risk posed by the air bubble artefact on CT head scans

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Background: Air bubble artefact is a low-density artefact mimicking ischemia that was first described in 2016. It is produced due to the formation of gas bubbles in the cooling system surrounding the Xray tube with an inconsistent appearance.

Objective: To review the rate of 'air bubble artefact' mimicking pathology on CT head scans and its clinical implications.

Methods: Retrospective review of CT head studies and subsequent imaging performed over 2 days from the onset of the artefact to its identification on Discovery HD scanner.

Results: 14 CT heads performed over two days on a particular GE (Discovery HD) scanner were analysed retrospectively. Artefact was present in 9 scans and reported as hypodensity and pathology in 8 scans. The artefact was interpreted as acute ischemic event in 4 cases, 1 of which was double reported and had a further MRI for evaluation. On other occasions, it was thought to represent chronic small vessel ischemic change in 3 cases and was superimposed on a finding of transependymal oedema on 1 case.

Conclusions: The timely identification of the artefact on this occasion was a result of awareness created by a previous audit in 2019, the presence of artefact on consecutive studies and a clinical correlation of the findings. As this artefact is not commonly picked up by routine quality checks, its awareness amongst radiologists can help in avoiding unnecessary investigations and undertake timely measures to correct it.

P19 Streamlining stroke imaging: a safe approach for TIA patients

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Background: The definition of transient ischemic attack (TIA) has evolved from one of time-based, symptom resolution within 24 hours, to a tissue-based approach, i.e. both symptom resolution and absence of infarction on MRI. A patient with resolved symptoms and MRI positive for infarct is diagnosed with an ischemic stroke. Demand for TIA /stroke MRI has increased in recent years. This places increased demands on service capacity and therefore there is a need to streamline imaging protocols as far as possible.

Objective: To determine if we can safely omit T2, FLAIR and T1W sequences from our standard stroke protocol, retaining DWI and FLAIR sequences alone without missing clinically significant findings.

Methods: We retrospectively reviewed the most recent 100 TIA patients who underwent MRI head with the standard protocol. Only DWI and FLAIR images were reviewed, and our findings were compared to the original report.

Results: No clinically significant findings were missed by solely focusing on the DWI and FLAIR sequences compared to the full stroke protocol. Signs of chronic haemorrhage from an incidental cavernoma, DVA, and parenchymal haemorrhage could all be seen on the b0 image although less obvious than on a T2* sequence. 56 of the 100 patients had also had a prior CT head for the same presentation.

Conclusion: Our results support the safe implementation of a shorter stroke MRI protocol for acute TIA patients, potentially enhancing scanner throughput.

P20 A combined in vivo PET/CT study of mitochondrial complex 1, sigma 1, and synaptic vesicle 2A in patients with amyotrophic lateral sclerosis

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Objective: This study investigates the potential link between mitochondrial energy dysfunction and synaptic impairment that may contribute to neurodegeneration in amyotrophic lateral sclerosis (ALS). We present preliminary findings from an ongoing longitudinal in-vivo imaging study of mitochondrial complex 1 (MC1), synaptic vesicle protein 2A (SV2A), and sigma 1 receptor (S1R), in ALS patients.

Methods: Nine patients with sporadic ALS (mean age: 59.1±9.7 years, King's staging: 2.42±1.08), and nine matched healthy controls (HC, mean age: 54.2±13.7 years), underwent clinical evaluation, a 3T MRI, and PET/CT scans using [18F]BCPP-EF for MC1, [11C]UCB-J for SV2A, and [11C]SA-4503 for S1R. Analysis deployed the Clinical Imaging Centre atlas for cortical and subcortical Region of Interest (ROI). Volume of distribution (VT) was the primary outcome measure for each tracer. Additional measures included VT corrected for plasma free fraction (VT/fp), and Distribution Volume Ratio minus 1 (DVR-1), using the Centrum Semiovale as reference. Due to notable volumetric differences between ALS and HC in cortical and subcortical ROIs, partial volume correction was applied.

Results: The ALS cohort had a mean ALSFRS of 41.44±4.5. Trends of lower [18F]BCPP-EF VT was observed in ALS patients, with significant difference in the amygdala (-16.4%, p=0.026). Conversely, [11C]UCB-J VT was significantly greater in the posterior cingulate (+11.2%, p=0.036) in ALS. No significant differences were detected in [11C]SA-4503 binding.

Conclusions: These preliminary, cross-sectional findings, provide initial evidence of altered MC1 and SV2A expression in ALS patients, compared with healthy controls. Collection of clinical and imaging data for up to 16 ALS patients, at baseline and at follow-up, is ongoing.

P21 Pictorial review of intramedullary spinal cord lesions and how to differentiate them

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Background: Signal abnormalities in the spinal cord have a broad range of differential and are challenging to differentiate. Due to the difficulties and risk associated with biopsies in this region it is imperative to be able to best diagnose this using imaging. Differentiating intramedullary causes of myelopathy, however, is challenging with significant overlap between causes. They can broadly be divided into demyelination, vascular, infective, inflammatory and malignant causes.

Objective: In this pictorial review we use imaging from example cases to demonstrate a systematic way of differentiating between causes of cord lesions.

Methods: We use imaging examples from a range of cases from our trust with cord lesions to highlight the difference in appearances between causes and summarise these using original diagrams.

Results: We demonstrate how the lesions can be differentiated using features such as their length, distribution and enhancement. For example, MS typically involves a short segment and is in an asymmetrical wedge shaped whereas transverse myelitis or NMO usually involves a longer cord segment and symmetrical. We additionally show differentials with classical appearances such as the "inverted V" sign in subacute combined degeneration of the cord. We discuss other imaging features that should be considered such as vein dilation in spinal arteriovenous fistulas.

Conclusion: This pictorial review will help general radiologists and trainees understand the anatomy of the spinal cord, differentiate and localise lesions with similar clinical presentations to provide guidance for further management, specific investigations, tertiary referral and review at MDTs.

P22 Symptomatic developmental venous anomaly with pontine capillary telangiectasia: a case report

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Background: Both symptomatic developmental venous anomalies (DVAs) and symptomatic pontine capillary telangiectasias are rare clinical conditions described in few case reports with controversial therapeutic options.

Objective: To describe the diagnostic process, imaging findings, and therapeutic considerations for a patient with a pontine capillary telangiectasia drained by a DVA with stenosis of its outflow pathway, caused by chronic thrombosis.

Methods: Case report.

Results: A 45-year-old female patient presented with a two-year history of progressive difficulty in walking and non-vertiginous dizziness. Neurological examination revealed dysarthria, left-sided facial paresis of central pattern, axial ataxia, right-sided appendicular hemiataxia, and preserved strength in all four limbs without sensory deficits. MRI revealed a subtle T2/FLAIR hyperintense lesion occupying the transverse extension of the pons, with marked low signal on susceptibility-weighted imaging (SWI), indicative of capillary telangiectasia. Post contrast T1 revealed patchy enhancement of the lesion and that it was drained by a large DVA. No other vascular malformations were identified on a full-body assessment. Angiography showed a severely stenotic outflow pathway of the DVA (right superior petrous sinus) with thinning, irregularities, and filling defects of this sinus, likely due to chronic thrombosis. Due to the severity of symptoms, anticoagulation was prescribed, but the patient refused treatment.

Conclusion: This case illustrates the role of imaging techniques in diagnosing these symptomatic vascular anomalies: MRI, the gold standard for identifying capillary telangiectasias, and angiography, the gold standard for characterising DVAs and assessing outflow obstructions. Further research is needed to establish consensual treatment protocols for these conditions when symptomatic.

Notes

Notes

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