

Here we present a literature review and case study of idiopathic of tumoral calcinosis. We describe the imaging findings, the clinical diagnostic criteria and the aetiological definitions. We make special reference to the more uncommon manifestation of tumoral calcinosis of the head and neck.

We will also present a case of our own who presented to both the oral and maxillofacial surgeons and the neurosurgeons. The patient presented with multifocal and painful masses over her hips, sacrum, cervical spine and mandible. The masses displayed rapid growth. The patient provoked such diagnostic dilemma that she was passed through a head and neck and a neuro-radiology MDT at regional tertiary centres before the correct diagnosis was reached by a general radiologist at a district general hospital.

Clinical: Neuroradiology

P-020 Management of sudden onset severe headache

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The traditional teaching on diagnosis of subarachnoid haemorrhage(SAH) is based on previous reports that computed tomography(CT) would be expected to miss approximately 1 in 20 SAH. In patients with high clinical suspicion and negative CT, lumbar puncture(LP) is performed. More recent data, however, suggests that the sensitivity of CT can be up to 100% when performed within six hours of symptom onset.

We carried out a retrospective observational case-note study of 227 patients who had a CT for suspected diagnosis of SAH over a one year period. 129 female and 98 male patients were identified with mean age of 47.6 years. Collected data included the timing of onset of symptoms, delay to presentation, symptoms and examination findings, vital observations, timing of subsequent investigations, and eventual diagnosis. Of the 227 patients identified, 30 had diagnosis of SAH on CT. Mortality rate among these patients were high(46.7%). 4 patients(1.8%) had another type of intracranial haemorrhage. Another abnormality was identified in 23(10.1%). 170(74.9%) had a normal CT. Of these 170 patients with a normal CT, 96 patients(56.5%) had a LP. 2 of these patients had positive xanthochromia, but neither had final diagnosis of SAH. Follow up of the remaining 74 patients to date revealed no mortalities – making diagnosis of SAH unlikely.

In combination with the reported data, this throws into question the added value of LPs in ruling out SAH. Can we use the timing of presentation and initial findings to avoid LPs in a select group?

P-021 An a la carte menu of neuroradiology signs

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Introduction: Certain pathological conditions have classic radiological appearances that are associated with food. These food signs are often quite specific and sometimes pathognomonic of these conditions. They can also be easily recognisable and memorable, helping a radiologist to make confident diagnoses, sometimes based on radiological findings alone. We therefore decided to host a neuroradiology banquet, presenting some of these signs in a delightful three course menu.

Content: We present a mouth watering á la carte menu which will include appetisers (cottage loaf, sandwiches and onion skin), mains (hamburgers, scallops and linguini) and desert (ice cream cone and berries). Each delicious dish will be accompanied with radiological examples giving a flavour of each sign and the condition it represents.

Discussion: This poster will provide a taste of some of the signs related to neuroradiological conditions. A review of these signs will remind radiologists about the appearances of conditions encountered in neuroradiology.

P-022 Cerebral microhaemorrhages – are they all the same?

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Aims: To describe the pathophysiology behind cerebral microhaemorrhage

To describe the different MR techniques used to identify cerebral microhaemorrhages.

To describe the differential diagnosis of cerebral microhaemorrhages.

Contents: A pictorial review of the causes of cerebral microhaemorrhages (CM) will be presented. We will highlight the different patterns of CM that enable a potential diagnostic cause to be elucidated.

First, we will describe the MR imaging techniques used to demonstrate CM. Then we will describe the imaging pitfalls such as calcifications and vascular flow voids.

We will then discuss the MR differentiation of the causes of CM including, hypertensive cerebral angiopathy, cerebral amyloid angiopathy, postradiotherapy angiopathy, neurovasculitis, diffuse axonal injury, cavernoma, septic emboli, haemorrhagic metastases and cerebral autosomal dominant arteriopathy with subcortical infarcts and leucoencephalopathy (CADASIL).

Relevance/discussion: Cerebral microhaemorrhages are increasingly detected on MR brain examinations. A detailed understanding of the pathophysiology and imaging diagnostic clues will help the radiologist to arrive at the correct diagnosis.

P-023 Signs of early ischaemia on CT head scans

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Introduction: Stroke is a common diagnosis encountered by radiology trainees with ischaemic stroke accounting for 80% of cases. CT is the primary modality for imaging stroke patients. It is used to detect stroke mimics and identify areas of reversible and irreversible damage due to ischaemia. Recognition of the early signs of ischaemia on CT is crucially important in order that therapies like endovascular clot retrieval and thrombolysis, which have been shown to improve prognosis, can be administered. Therefore, it is important that radiology registrars are aware of the subtle, early signs of ischaemic stroke which can often be overlooked on CT.

Aims: This poster aims to inform radiologists and registrars about the early signs of ischaemia and the key review areas related to stroke on CT.

Content: The poster will describe the four main ancillary signs of early, acute stroke on CT. These are the insular ribbon sign, the hyper-dense vessel sign, loss of grey white matter differentiation and the cortical ribbon sign. Each sign will be displayed with diagrams and examples. CT images will be correlated with corresponding MR images to illustrate ischaemic damage. There will also be a discussion about what each sign represents, its clinical significance, and the best method of identification on CT.

Discussion/conclusion: Detecting stroke early can improve prognostic outcomes. This poster serves to remind radiologists about the early signs of stroke which can be easily missed on CT.

P-024 Stroke mimics

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Aim: To illustrate the CT and MRI appearances of clinical conditions which mimic acute ischaemic infarction.

Relevance: Acute stroke is a leading cause of morbidity and mortality worldwide and accounts for approximately 11% of deaths in the UK. Prompt identification of symptoms coupled with early assessment and treatment with thrombolysis/anticoagulation in appropriate cases have significantly improved patient outcomes. There are a number of conditions which present with a similar clinical picture as ischaemic stroke and identifying these alternative pathologies is crucial. Common mimics such as hypoglycaemia and seizure must be identified clinically, but many diagnoses can be identified radiologically. Detection of stroke mimics prevents the inappropriate use of thrombolysis and helps guide prompt, appropriate management.

Content: We illustrate the radiological appearances of common mimics of acute ischaemic stroke on plain and contrast enhanced CT and MRI including diffusion weighted imaging. These comprise other vascular causes such as

haemorrhage and venous infarction and non vascular causes including neoplasms, infection, inflammatory processes and toxic and metabolic conditions.

Conclusion: The radiologist is vital in identifying conditions which mimic acute ischaemic stroke. This helps to prevent the inappropriate administration of thrombolysis and direct clinical management. This pictorial review illustrates common and important radiological mimics.

P-025 Spinal cystic disease: a pictorial review

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Aims: Spinal cysts have an incidence of approximately 1%. They are commonly found incidentally on imaging but may be symptomatic and can be associated with vague and variable symptoms. This poster will summarise the various types of cyst found in the spine, and highlight their imaging features and classification where appropriate.

Method: Pictorial review

Discussion: Spinal cysts can be classified as congenital or acquired. Congenital cysts can form because of structural abnormalities (such as an Arnold-Chiari malformation) that obstruct CSF flow, or due to structural defects in the meninges. Acquired cysts are usually secondary to local inflammation, caused by trauma, infection, or tumour. Diagnosis can be delayed due to the late development of the cyst, and symptom crossover with the original lesion. The main imaging tool in the diagnosis and assessment of these lesions is MRI. The location of the cyst in relation to the spinal medulla and meninges is important in diagnosis, but not specific. Cyst appearances will be determined by internal content; usually CSF-like (hypointense on T1, hyperintense on T2). However varying protein and fat levels, or the presence of dermal appendages, can change this. MRI is also useful in detecting the presence of associated malformations. CT has a role in assessing secondary changes in the bony spine, and CT myelography is important in characterising meningeal cysts.

Conclusion: Accurate imaging interpretation of spinal cystic disease is key to establishing likely diagnosis and guiding appropriate management.

P-026 Spinal cord diseases – a MR diagnostic approach

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Aims: To describe the pathophysiology of the differential diagnosis of spinal cord diseases.

To describe the differentiating MR features of the important spinal cord diseases.

Contents: Spinal cord diseases are not uncommon in radiological practise. The spinal cord can be affected by a myriad of different pathological processes. Most of these result in T2 hyperintense lesions. Therefore, the morphology and topographic location of these lesions becomes central to differentiating between the different pathological processes.

We will present a pictorial review of the major diseases affecting the spinal cord. We will focus on demyelination, inflammatory, tumours, posttraumatic and vascular causes.

We will highlight the important differential diagnostic MR patterns of spinal cord disease. Also, we will highlight the important clinical history and examination features that help narrow the differential diagnosis.

The differential diagnosis of cord abnormalities include; cord infarction, syrinx, multiple sclerosis, acute disseminated encephalomyelitis, neuromyelitis optica, transverse myelitis, cord tumours (including, astrocytoma, ependymoma, haemangioblastoma and metastases), infectious and post traumatic myelopathy and subacute combined degeneration of the cord.

Relevance/ discussion: The MR imaging of spinal cord diseases can be challenging. We will provide an approach to the interpretation of spinal MRI to help the radiologist to accurately diagnose the clinical condition.

P-027 Lumbar puncture CSF sampling of suspected subarachnoid haemorrhage following a negative CT head

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Background: Subarachnoid haemorrhage is a medical emergency with a recognized high mortality. A negative CT head does not fully exclude subarachnoid haemorrhage. Therefore obtaining a lumbar puncture following a negative CT head is a practice that is widely considered a must.

Aims: To assess our local compliance with local guidelines necessitating a lumbar puncture in all patients admitted suspected of suffering a subarachnoid haemorrhage where a CT head is found to be negative.

Methods: All patients undergoing an emergency CT head with a history stating or indicating a working diagnosis of acute subarachnoid haemorrhage over a period of 6 months were included. The hospital's electronic laboratory records were reviewed to establish if an LP was performed in accordance with the local guidelines.

Results: 49 patients with negative CT for SAH were identified (mean age = 45.71, range 19-96 years). 81.63% (n=40) were females. In 46.93% (n=23) an LP was performed (LP group mean age = 43.17, range 24-61 years). Of these, 86.96% were females. This indicated that younger females were more likely to undergo an LP.

Discussion: LP is 100% sensitive in the diagnosis of SAH and is hence recommended in all patients suspected of SAH following a negative CT head.

Our audit identified significant room for improvement in our practice. We aim to raise awareness with these short falls with a re-audit planned after an interval period where we will also assess the notes to review if the decision not to do an LP had a documented justification.

P-028 Preoperative tumour volume and its effect on survival in adult patients with cerebral glioma

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Background and Purpose: The prognostic value of preoperative tumour volume in adult patients with cerebral glioma remains questionable. Tumour volume can be measured using different approaches, each with their individual set of advantages and disadvantages. What's more is the increasing use of high resolution MRI, especially in the avenue of medical research. This study explored the predictive value of preoperative tumour volume in adult patients with low-grade and high-grade cerebral glioma. Two different methods of volume measurement were investigated, together with the use of both low-resolution and high-resolution MRI.

Methods: 64 MRI scans from 43 adult patients with cerebral glioma were analysed retrospectively. Preoperative tumour volume was measured using two approaches: the geometric (ellipsoid) method, and the semi-automated segmentation (volumetric) technique. Measurements were performed on both high-resolution and low-resolution post-contrast T1-weighted MR images. Volume measurements were compared between the two methods utilised and the two MRI datasets. Survival analysis was performed using the Cox proportional hazards model, with overall survival (OS) and time to progression (TTP) used as clinical endpoints.

Results: Measurements performed using the ellipsoid method were significantly overestimated. Volumetric measurements were comparable between the low-resolution and high-resolution datasets. Survival analysis did not identify preoperative tumour volume as a prognostic factor for OS or TTP.

Conclusions: This small study suggests the ellipsoid method overestimates volume. Volumetric measurements on low-resolution MR images are comparable and therefore a practical alternative to volumetric measurements on high-resolution MR images. Although preoperative tumour volume failed to predict survival, further cohort studies are undoubtedly required.

P-029 Extra-axial collections: A practical CT/MRI guide for general radiologists to avoid life threatening misdiagnosis

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In the last two decades the workload of radiologists reporting emergency scans has become increasingly demanding due to the large increase in the numbers of acute CT brain scans.

Extra axial collections are very common conditions in the A&E clinical setting and could be broadly categorized into the extradural, subdural and subarachnoid spaces.

Whilst extradural and subarachnoid located lesions are quite easy to recognize, subdural collections could be often misinterpreted as innocuous medical conditions when they are actually acute and potentially life threatening in nature. We will also emphasize the differentiating features between true extra-axial collections from mimics such as pseudo-extra-axial collections that occur with brain atrophy and intracranial hypotension syndrome.

The imaging and pathophysiology characteristics of extra-axial collections will be discussed. We will describe the anatomical explanation of the differential diagnoses. We will emphasize the following conditions: Epidural haematoma, Subdural haematoma (acute, chronic, acute on chronic), Subdural hygroma (acute and chronic), Intracranial hypotension syndrome and Cerebral atrophy as a cause of confusion in diagnosis of extra-axial collections.

The potential misdiagnosis between chronic subdural and acute hygroma, bilateral chronic subdural and intracranial hypotension, chronic hygroma or chronic subdural and uni- or bilateral brain atrophy will be addressed giving to the general radiologist a practical work guide.

P-030 A comparison of endovascular intervention to surgical clipping for subarachnoid haemorrhages - a retrospective audit

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Background: Subarachnoid haemorrhages (SAH) has upto a 60% mortality within the 1st 30 days. The two established management strategies are endovascular intervention and surgical clipping. Our aim was to compare the outcomes of endovascular intervention to surgical clipping and to establish the preferred treatment.

Methods: For the 1st audit, 212 consecutive patients were identified using the SAH referral database between a year's period. For the re-audit, 73 consecutive patients were identified in a 6 month period in the following year. Electronic patient records were used to obtain patient demographics, clinical findings, radiology reports and follow up.

Results: Success rate of endovascular intervention was 94%/91% for the initial audit/re-audit respectively. Success rate for surgical clipping was 86%/76%. 94%/81% of SAH were aneurysmal, 4%/15.1% non-aneurysmal and 2%/1.4% dural AV fistula and AVM. The majority of the aneurysms were located in the anterior communicating and middle cerebral arteries for both audit cycles. Overall mortality was 11%/22% with 81% grade 4-5 WFNS in the re-audit.

Conclusion: The success rates were in line with national standards for both treatments in both audit cycles. Surgical clipping was favoured for more complex cases and this may account for its decreased success rate and increased mortality. Elective treatment of aneurysms were mostly managed with endovascular intervention which would also account for the variation in success and mortality between coiling and clipping. Endovascular intervention remains the preferred method of treatment for uncomplicated aneurysmal SAH at our hospital. Weekly neurovascular MDT meetings allow improve patient selection for both treatments.

P-031 Seeing straight? A radiological perspective on visual pathway lesions

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Aims/objectives: Anatomic -radiologic description of visual pathway lesions presenting with visual symptoms

Content: Classically, in the clinical evaluation of visual symptoms, certain clinical features would lead a medical practitioner to a relatively accurate diagnosis. With further advances in neuroradiology, we look at a variety of common lesion that can present vision alteration with a look at the typical and atypical MRI and CT imaging findings correlated to anatomy and differentials to be considered. An emphasis on the radiologic- clinical correlation and anatomy is made. From tumours as simple as petrous bone meningiomas and metastatic malignancy to segmental

infarction are described pictorially with the clinical presentation. Emphasis is also made on the use of contrast to highlight otherwise subtle lesions .

Relevance. The features of common visual problem presentations such hemianopia, nystagmus or neglect are essential in the anatomic search and radiologic evaluation and diagnosis . However, any given particular presentation can be due to a number of lesions along the visual pathway and this poster gives illustrative examples.

P-032 Axial FLAIR MRI imaging for reassurance in the outpatient neurology setting

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Background: Brain scans are often performed to reassure patients that headaches that no serious underlying pathological exists, despite no such recommendations from recent NICE or RCR guidelines. Many such patients are relatively young, so ALARA dose minimisation prompted local protocol review: Single sequence axial FLAIR MRI was proposed in lieu of CT for increased sensitivity yet still not having heavy resource implications.

Method: 500 'young' patients prospectively selected with "scan for reassurance" as primary indication; images correlated with clinical records.

Results: Median patient age was 37y (range 15y to 48y); commonest presenting symptoms were headache (95%) and nausea (11%). No significant lesions were detected. 1.8% had incidental findings (images will be shown on poster). Additionally, 20% overall had sinus disease which may be pertinent.

Conclusion: Single sequence FLAIR imaging can exclude serious pathologies without ionising radiation, without excessive consumption of MR resources and without raising significant diagnostic dilemmas with incidental findings. The programme continues recruiting to clarify the advantages and explore the limitations of the method.

P-033 Congenital perisylvian syndrome

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Perisylvian syndrome, also known as Opercular syndrome, can present with epilepsy, pseudobulbar features (difficulty chewing and swallowing), facial muscle paralysis, intellectual disability and delayed speech and language development. It is a neurological disorder which can be acquired due to a lesion of the anterior operculum, e.g. secondary to an infarct or, rarely, congenital. Anatomical structural abnormalities include polymicrogyria of the cerebral cortex and increased cortical thickness at the Sylvian fissure. The condition is usually diagnosed in early childhood. Brain MRI is necessary for an accurate diagnosis of congenital perisylvian syndrome, which can be either unilateral or bilateral. We present 3 cases of paediatric Perisylvian syndrome, one of which is unilateral and the other two bilateral, and discuss the MRI features peculiar to that syndrome with a hint at the genetic background.

Clinical: Breast

P-035 Breast imaging in women under 40 with symptomatic breast disease

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Introduction: Current UK guidelines recommend mammography as the first line imaging technique in symptomatic women aged over 35 years and ultrasonography in women under 35 years. However, the use of imaging in patients aged 35 to 40 varies across different centres.

Aims: To determine whether performing mammograms in patients under 40 years made a difference to their subsequent management compared to clinical assessment and ultrasound alone.

Materials and Methods: We performed a retrospective review of written and electronic records of patients under 40 who underwent both mammography and ultrasonography at Homerton University Hospital between January 2011 and July 2012.