

Abstract

Paragangliomas are uncommon, highly vascular tumours arising from neural crest cells. In the head and neck these are typically non-secretory parasympathetic tumours arising from the carotid bodies, jugular, tympanic and vagal paraganglia. They are also known as non-chromaffin paragangliomas, chemodectomas and more commonly as glomus tumours.

Whilst tumours are typically slow growing and benign, imaging studies enable early detection and accurate anatomical delineation, which is essential for appropriate treatment decision making (surgery versus radiotherapy). Symptoms are mostly caused by local mass effect compressing the adjacent cranial nerves or pulsatile tinnitus.

We present multimodality imaging characteristics common to paragangliomas of the head and neck and describe the different anatomical features of each main subtype; namely carotid body tumours, glomus jugulare, glomus tympanicum and glomus vagale tumours, as well as drawing attention to paragangliomas in lesser encountered locations in the head and neck.

An approach to aid differentiation between the subtypes of paragangliomas and from other potential differential diagnoses is suggested.

In addition, we present radiological features and imaging strategies for multicentric paragangliomas as manifestations of hereditary syndromes seen in a tertiary referral centre.

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- 10) Radiological images are from UHB NHS FT (Queen Elizabeth Hospital Birmingham, Radiology Department). Diagrammatic illustrations are adapted from Gray's Anatomy online via <http://www.bartleby.com> (public domain).

Biography

Dr Christopher Bowles is a Clinical Radiology Specialty Trainee Year 4

Abstract

Bacterial meningitis remains a cause of serious morbidity and mortality. Meningitis secondary to sinusitis, otitis media and or mastoiditis is well recognised. Head CT is often performed prior to a lumbar puncture. (1,2) Little literature exists on the incidence of clinically unsuspected sinus or ear disease in the patient presenting with de novo meningitis (3) and relevant history can be difficult to establish.

Without a clinical suspicion of sinus or middle ear disease, the presenting CT brain scans of all patients (n= 19) with microbiologically proven bacterial meningitis were reviewed retrospectively from January 2013 to March 2015. The scan coverage and incidence of sinus, middle ear, mastoid or petrous apex opacification was assessed with a modified Lund-MacKay scoring system (4,5).

Of 19 patients with proven bacterial meningitis, 8 patients had radiological evidence of sinus infection, 2 patients had evidence of middle ear/mastoid infection. Retrospectively, 4 patients had evidence of a tegmen defect or a cribriform plate dehiscence, not apparent on axial reconstructions.

This suggests a high incidence of clinically unsuspected sinogenic or otogenic septic sources in bacterial meningitis, along with a high incidence of subtle tegmen/cribriform plate defects.

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Biography

Dr Hiten Joshi completed his undergraduate training in 2007 at Barts and The Royal London Medical School. Following this, he completed core surgical training (ENT themed) and is currently in his first year of clinical radiology training. He lives in East Yorkshire with his wife and 2 daughters and enjoys cooking, gardening and fitness activities.

Abstract

Introduction: Branchial cleft anomalies are uncommon and their complications can cause significant patient morbidity as well as pose a formidable challenge to clinicians. Patients can present on multiple occasions and diagnosis can take several years to be reached; we present such a case.

Case: A 4 year old girl presented in 2010 with a painful left sided neck swelling. Initially a diagnosis of an infected thyroglossal cyst was made and the child's symptoms settled with antibiotics. She re-presented a few months later and an USS demonstrated a left anterior neck swelling extending to the hyoid and the same diagnosis as previous was made; this time the patient underwent surgical drainage of the infected neck swelling. She re-presented in 2015 and USS gave a diagnosis of a loculated collection in the left anterior neck. A MRI scan was performed which demonstrated a complex collection with a tract extending from the collection to the left pyriform sinus for which she underwent surgical drainage. The suggestion of a persistent fourth branchial arch anomaly was made. A contrast swallow examination is planned for confirmation.

Discussion: Branchial cleft anomalies are uncommon with 4th branchial cleft anomalies being extremely rare. Anomalies can present in the form of a sinus, fistula or a cyst either independently or as a combination. Fourth branchial cleft anomalies originate at the apex of the pyriform sinus and often terminate in the perithyroid space, thyroid gland or cervical oesophagus, where they often manifest clinically as an abscess.

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A chameleon in the neck: Neck lumps mimicking thyroid nodules
Dr Ramanan Rajakulasingam, Radiology Specialty Registrar,
Queen Elizabeth Hospital, London

Biography

Dr Ramanan Rajakulasingam is a Specialty Trainee Year 2 Radiology registrar in the West Midlands training scheme

Abstract

The aetiology of neck lesions are diverse and can represent both clinical and diagnostic challenges. A common presentation is of a lower neck mass, likely arising from the thyroid. Dr Rajakulasingam will present a review of non-thyroid pathologies mimicking thyroid masses.

Cases discussed all presented for imaging of a "Thyroid mass". Pathologies include a fourth branchial cleft cyst, laryngeal plasmacytoma, inferior thyroid artery pseudoaneurysm (secondary to blind FNA), vagal schwannoma, and lipomas.

Dr Rajakulasingam will discuss these challenging cases including interpretative pearls and pitfalls for the radiologist. Careful initial ultrasound is the cornerstone in differentiating many of these extra thyroid lesions and guiding biopsy. A misdiagnosed origin may expose the patient to unnecessary imaging and potentially dangerous surgery. Therefore knowledge of the anatomical, sonographic and cross sectional imaging features of a wide range of extra thyroid lesions are crucial in avoiding misdiagnosis and directing definitive management.

Key references

- 1) All images are taken from the PACS system at the Queen Elizabeth hospital

Comparison of 14G, 16G and 18G core biopsies of lymph nodes in patients with suspected lymphoma
Dr Sandeep Tiwari, Radiology Specialist Registrar, King's Mill Hospital, Mansfield

Biography

Dr Sandeep Tiwari is a Radiology Specialty Trainee Year 4 working in East Midlands North Scheme.

Bachelor of Medicine (MBBS) March 2003

Member of the Royal College of Surgeons (MRCS) January 2009

Fellowship of the Royal College of Radiologists (FRCR) May 2015

Abstract

Introduction: Fine Needle Aspiration Cytology of lymph nodes has poor sensitivity for diagnosis of lymphoproliferative disorders. Core biopsy is preferred when lymphoma is suspected.

It has been suggested that enlarged ovoid nodes with central echogenic hila (lymphoma morphology) are lymphomatous or reactive.

The purpose of our study was to:

- 1) Determine the histological diagnosis in patients with this nodal appearance
- 2) Determine the adequacy of core biopsies (RCR audit template, target 95%).
- 3) Compare outcomes of differing core biopsy sizes for nodes with lymphoma morphology.

Methods: 58 consecutive patients who underwent ultrasound guided core biopsy of nodes with lymphoma morphology or a final diagnosis of lymphoma between January 2011 and May 2014 were retrospectively evaluated. All the biopsies were performed by a single operator. Selection of biopsy gauge related to changing departmental policy rather than node size. The core biopsy strategy was agreed with the pathology department in advance.

Results: Needle gauge adequacy lymphoma diagnosed and typed

18G (n=21) 95% 69%

16G (n=29) 96% 88%

14G (n=8) 100% 87%

90% of nodes with lymphoma morphology were diagnosed as reactive or lymphoma on final histology

Conclusions: Our figures suggest that larger biopsies are better for diagnosing and typing lymphoma. Nodes with lymphoma morphology are likely to be lymphomatous or reactive and a core biopsy should be performed rather than an FNA.

Ultrasound guided core biopsy has a high yield in lymphoma and may obviate unnecessary excision biopsy.

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A case of spontaneous retropharyngeal haemorrhage

Dr Jane Topple, Radiology Specialist Registrar, Barts Health NHS Trust

Biography

Dr Jane Topple will complete her Radiology training at Barts Health Trust in 2015. Her subspecialty interest areas include Neuroradiology and Head and Neck Imaging. Prior to her medical training she completed a music performance degree at the University of Toronto in Toronto, Canada. She is the founder of The Edible Architecture Company.

Abstract

Large volume spontaneous mediastinal haemorrhage is an unexpected and infrequent radiological finding. These patients are at risk of sudden airway obstruction and cardiovascular instability if the bleeding is uncontrolled.

We present a case of a 60-year-old patient who developed rapid onset of neck swelling, dysphagia and chest pain radiating to the shoulder blades. Bruising was visualised over the neck and chest wall. Initial ultrasound (US), computed tomography (CT) and magnetic resonance imaging (MRI) scanning revealed a large retropharyngeal collection displacing the trachea anteriorly.

The patient remained stable over the course of the hospital admission and settled with conservative management. Follow-up imaging with US demonstrated complete resolution of the haematoma.

The aims of this presentation are to review the pertinent imaging findings in this case, discuss the differential diagnosis and identify the imaging findings that helped to reveal the final diagnosis.

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Seeing is believing: A rare orbital complication of an unusual disease
Dr Lucy Childs, Radiology Specialist Registrar, Barts Health NHS Trust

Biography

Dr Lucy Childs is a third year Radiology Registrar with Barts Health NHS Trust working at the Royal London Hospital and St Bartholomew's Hospital.

Abstract

Aims: Present the clinical manifestations and associated imaging findings of a rare disease with orbital involvement.

Objectives:

- Understand the spectrum of known imaging features and clinical presentation of CNS infiltration of Waldenstrom's Macroglobulinaemia, so called 'Bing Neel' Syndrome.
- Obtain a basic understanding of the disease process
- Be able to recognise the imaging appearance of this rare disease with specific reference to manifestations within the head and neck.

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So what if it's hot? Evaluating incidental PET positive thyroid lesions
Dr Neena Kalsy, Radiology Specialty Trainee, Royal Liverpool Hospital

Biography

Neena Kalsy studied medicine at University of Leicester. After completing her studies she trained as an Academic Foundation Doctor in the Mersey deanery. She undertook a post as Anatomy Demonstrator. She has a keen interest in education. After her Foundation Year training she worked in A&E, until she took a post in radiology. Currently, she is a second year Radiology Trainee in Mersey.

Abstract

Aims/Objectives: To determine the significance of thyroid lesions showing uptake on PET imaging.

Content: Thyroid nodules are common; however the overall clinical implication of incidental nodules is uncertain, with evidence suggesting a high malignancy risk in PET positive thyroid lesions. Incidental uptake of tracer in the thyroid gland during PET imaging and often leads to further investigation with ultrasound and fine needle aspiration cytology. Dr Kalsy has reviewed all cases of PET positive thyroid uptake from January 2013 to August 2014 with data obtained from subsequent ultrasound, FNA cytology and excisional histopathology to review the significance this finding.

Outcomes/ Impact: 47 PET positive thyroid lesions were identified, on FDG PET and F18 PET imaging in 46 patients. Uptake was focal, multifocal or diffuse in 29, 6, and 12 scans respectively. Ultrasound was performed in 24/46 (52%) patients overall, with ultrasound rate higher in patients with focal thyroid uptake (62%) compared to multifocal or diffuse change (both 33%). 11 patients had FNA cytology of which 8 were benign (thy2) and 3 were indeterminate (thy 3F). Final histology confirmed 2 follicular adenomas, and no malignant lesions detected. 11 patients with focal uptake did not have US ultrasound performed.

Discussion: 0/47 cases of PET positive thyroid uptake showed malignancy. Provisional data suggests a much lower malignancy rate in incidentally detected PET positive thyroid lesions than published literature. We recognise restrictions to follow up and further work with larger sample size is on-going.

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The diagnostic performance of ultrasound guided core biopsy in the diagnosis of parotid neoplasia-results in 305 patients
Dr Guven Kaya, Radiology Specialty Registrar, East Sussex Healthcare NHS Trust

Abstract

Introduction: The optimum means of pre-operative diagnosis of a parotid lesion remains controversial. Ultrasound guided core biopsy (USCB) is increasingly considered the modality of choice in many centres. We present USCB data from a large series of parotid neoplasms and discuss the performance of USCB when compared to other biopsy techniques currently in use namely fine needle aspiration cytology (FNAC) and frozen section.

Methods: A 16 year retrospective analysis was performed of all patients on the hospital pathology database with a final diagnosis of parotid neoplasia. All biopsy modalities utilised in the diagnostic pathway were examined and compared.

Results: 398 patients were included with 313 USCB and 259 surgical excision specimens. 4.2% of USCB were non-diagnostic. 132 patients had a final diagnosis made by USCB and did not undergo surgery. 257 patients underwent surgery and of these 226 had a preoperative biopsy. The majority of lesions were benign. There were 62 parotid and 11 haematological malignancies. There were 2 false negative USCB samples (these will be discussed). USCB had a sensitivity of 93% and specificity of 100%. There were no serious complications and no tumour seeding in the series to date.

Conclusion: This is the largest series of USCB data in parotid neoplasia. The results confirm USCB is highly accurate and safe in parotid diagnosis, in particular no tumour seeding has been demonstrated although continued follow up is needed. Where available USCB should be considered the primary biopsy technique of choice in parotid diagnosis.

Key references

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Doctor I have a lump in my mouth

Dr Gemma Price, Radiology Specialist Registrar, University College London Hospitals

Biography

Dr Gemma Price is a fourth year Radiology Trainee at University College Hospital subspecialising in Head and Neck Imaging.

Abstract

Learning objectives:

- Discuss the radiological approach to a patient presenting with a palatal lump
- Understand the use of different imaging modalities to assess the palate, in particular the innovative use of intraoral ultrasound at our institution
- Discuss the differential diagnoses for palatal lesions
- Recognise the imaging findings of MALT lymphoma in the head and neck in an unusual presentation of multisite disease (palatal, buccal, salivary)

Case and imaging findings: Dr Price describes the case of a patient who presented with a lump in the palate and discuss the differential diagnoses. The case and differentials are illustrated across imaging modalities, including the use of intraoral ultrasound for palatal lesions.

The case demonstrates interesting appearances on CT and MR, with imaging revealing the involvement of multiple sites in the head and neck including the palate, salivary glands and buccal mucosa.

Dr Price reviews the literature of the imaging features of extranodal MALT type lymphoma arising within the head and neck.

Conclusion: The case demonstrates several features of head and neck MALT lymphoma, with review of the imaging findings and important differential diagnoses. Whilst considering the imaging modalities we share our innovative approach to ultrasound of the oral cavity to assess the palate.

Key references

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Biography

Dr John Robinson is a Specialist Trainee in Radiology within the Northern Deanery.

Abstract

Optimisation of imaging technique is crucial for accurate head and neck cancer staging. In contrast enhanced neck CT, primary tumour delineation is improved with late phase imaging whilst nodes and vessels are generally better assessed with an early phase examination. The standard protocol in our institution involved locoregional staging by neck CT obtained 45 seconds post 70mls contrast injection, followed by a separate chest/upper abdomen scan 60seconds after a 2nd 70ml contrast bolus. Dr Robinson considered the impact of reversing this dual phase technique to take advantage of both early and late phase enhancement with the aims of;

1. Better delineating the primary tumour (late phase benefit)
2. Providing good vascular opacification (early phase benefit)
3. Staging the chest/abdomen in a conventional phase of enhancement to increase confidence when evaluating abnormalities (incidental or metastases)

Over a 12 month period all primary staging CT studies performed for histologically proven laryngeal and T2-T3 oropharyngeal squamous cell carcinomas were evaluated.

Hounsfield unit measurements of the tumour, specific muscle and vascular structures were obtained. The same measurements were performed from a comparable group previously imaged on the same scanner but using the previous dual bolus technique.

The findings indicate that the newer technique provided good vascular opacification, improved tumour enhancement and conventional thoracic & upper abdominal portal venous phase enhancement. Disadvantages include having to perform "staging" before evaluating the primary lesion and variable delays post 1st bolus for the neck component.

CT appearances of the “expanded labyrinth”

Dr Elinor Warner, Core surgical trainee Year 1, London North West Healthcare NHS Trust

Biography

Elinor Warner is a CT1 Surgical Trainee in London, aiming to pursue a career in ENT surgery. After studying medicine at Oxford and UCL Elinor completed an Academic Foundation post at Guy's and St. Thomas' Hospital. It was here that she developed her academic interest in ENT whilst working in the department at Guy's Hospital. She is currently a CT1 Trainee in ENT at Northwick Park Hospital.

Abstract

Introduction: Inflammation of the labyrinthine structures may result from meningitic, haematogenous or tympanogenic aetiologies. Imaging features are characterised by enhancement on MRI with potential development of intra-labyrinthine calcification (labyrinthitis ossificans) on CT. Dr Warner presents two cases with an unusual form of chronic erosive labyrinthitis with osteonecrotic changes which is termed “labyrinthine sequestrum”. It is postulated that the non-resolving infection and development of chronic tympanogenic labyrinthitis in these patients resulted from the presence of indwelling auditory implants. We highlight the aggressive osteolysis, calcification and loss of otic capsular morphology, which typifies the CT appearances of labyrinthine sequestrum (1). The characteristic appearances of the amorphous “expanded labyrinth” should not be confused with other causes of perilabyrinthine lucency (e.g.otosyphilis, otospongiosis, osteogenesis imperfecta).

Case reports: A 53 year old man had a non-eventful right stapedectomy, but three weeks postoperatively he developed otorrhoea followed by sudden onset sensorineural hearing loss. An additional 75 year old diabetic man underwent a successful right cochlear implant, however three years post implantation, he developed a partial right facial palsy in association with right otorrhoea. In both cases, CT scan showed an amorphous, diffusely expanded otic capsule, with loss of the internal architecture of the cochlea. Focal calcific opacities (representing bony sequestrations) were present within the amorphous otic capsule.

Conclusions: The imaging appearances of labyrinthine sequestrum are hitherto not well described. In an era when an increasing number of auditory implant procedures are being performed, it is important that radiologists recognise the imaging features of the “expanded labyrinth” may result from chronic tympanogenic labyrinthine infection.

Key references

- 1) Lao Z et al. Labyrinthine sequestrum: Four case studies. *Otolaryngol Head Neck Surg.* 2012 ;147:535-7.