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11:30 – 13:00 Pitfalls in Diagnostic Imaging

A24

Pitfalls in paediatric oncologic imaging

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Cancer Imaging 2019, **19(Suppl 1):**A24

Radiologists are very good at opting to image new abdominal or superficial masses in children with ultrasound. It is easy to forget, however, to assess for regional lymphadenopathy, which is very important for many malignancies, particularly limb tumours and sarcomas (the inguinal or axillary regions for lower and upper limb tumours respectively should also be routinely evaluated). Pediatric tumours tend not to invade other organs but they can often be adherent to adjacent viscera – real time dynamic ultrasound can be very useful to assess movement of one organ relative to another. When considering cross-sectional imaging, CT is easier than MRI to do in children as CT scanning is so fast. MRI, however, is often the better test and is superior for assessing spinal canal invasion, chest wall involvement by tumour and bone marrow disease. MRI is best for pelvic, liver, paraspinal and neck masses as a general rule, and ideally should be performed for all new abdominal masses at initial presentation. Due to their usual lack of mediastinal and intra-abdominal fat, non-contrast enhanced CT is generally a waste of time and best avoided in children. Dual or triple phased enhanced CT is seldom necessary (all masses should have been assessed with Doppler ultrasound before a CT) and should also be avoided to reduce the radiation burden from CT.
This abstract has been previously published.

A25

Paediatric PET/CT: physiologic uptake, normal variants and pitfalls

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The normal distribution and physiologic variants of 18F-FDG uptake differs between children and adults and it is important to recognise this to avoid pitfalls in interpretation. This is especially important when the location of uptake can obscure or mimic pathologies.

Brown adipose tissue

Brown adipose tissue contains large quantities of mitochondrion and induces non-shivering thermogenesis to control body temperature and energy expenditure. Its presence is related to BMI, age, sex and outdoor temperature, with age being the most important factor in our cohort (younger patients have a higher prevalence) [1]. It is mostly detected by symmetrical uptake on PET in the supraclavicular region and lower neck. Other sites include the axillae, mediastinum, perivascular, paravertebral, intercostal and infra-diaphragmatic regions.

Thymus Gland

The normal thymus gland in children typically has diffuse, very low grade uptake, which generally disappears during adolescence. The normal thymus gland may shrink during stress (e.g. chemotherapy), and upon recovery become larger, indicating thymic rebound hyperplasia. The thymus gland is diffusely enlarged with a smooth convex contour and homogenous low grade uptake. Although this commonly occurs 2-6 months after chemotherapy, thymic rebound can develop over a period as short as one week, and may persist for 12-24 months [2]. It has been found that the time course of FDG uptake reaches a peak around 10 months after therapy, and will decline slowly thereafter [3]. Occasionally, thymic hyperplasia may extend superiorly and appear as a superior mediastinal nodule which may be confused as adenopathy [4].

Adenoids

Adenoids are prominent in children compared to adults and the uptake may be moderate in the lymphatic tissue peaking at 6-8 years of age [5]. Its symmetrical shape and diffuse uptake usually helps to distinguish it from pathology.

Cervical and mesenteric lymph nodes

Cervical lymph nodes larger than 10mm in short axis diameter are common in children, of which some maybe reactive lymph nodes and may show increased uptake. Although uptake is generally higher in malignant compared to benign lymph nodes, there is no well accepted cut-off value and overlap exists [6]. CT features including shape, configuration and enhancement are important in improving specificity.

Mesenteric lymph nodes are commonly prominent in children, especially in the right lower quadrant, and are non-specific. Lymph node size peaks at around 10 years of age then decreases with age, and asymptomatic children may have mesenteric nodes measuring up to 10mm in short axis diameter [7].

Physeal plate

Skeletally immature patients demonstrate physiological linear uptake along the physes and apophyses.

Skeletal muscle

Babies suckling on pacifiers during uptake time may have skeletal muscle uptake in the masseter muscles and tongue, and crying may cause uptake in the diaphragmatic crus and intercostal muscles.

Ovaries and endometrium
Physiologic uptake is seen in the endometrium during midcycle and during menstruation, whilst normal ovarian uptake is seen at mid-cycle ovulation and in corpus luteal cysts.

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A26
Pitfalls in Genitourinary Imaging
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Cancer Imaging 2019, **19(Suppl 1):**A26

The best chance of making a positive impact on patient management and outcomes through imaging is to ensure optimal image acquisition, interpretation and communication with all parties involved in patient care. In genitourinary imaging pitfalls arise in these three domains, and this lecture will focus on systematic approaches to recognise and avoid them as well as tips to prevent them. There will be a focus on cancer and cancer mimics, and a variety of cancers involving the urinary system and male and female genital organs will be covered.

Afternoon Session: 14:15 – 15:30 Gynaecological Cancer

A27
Ovarian Masses: Differential Diagnosis and Clinical Implications
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Cancer Imaging 2019, **19(Suppl 1):**A27

Adnexal masses, both incidental and symptomatic, are a common finding in clinical practice and pose a challenging diagnostic problem. Approximately 25% of sonographically identified adnexal masses have indeterminate origin. Despite these lesions have low rate of malignancy (10-20%), patients are frequently referred for surgery.
A multidisciplinary approach with physical examination, imaging exams and laboratory tests is necessary for the evaluation of an adnexal mass.
Primary ovarian tumours can be classified, according to tumour origin, in epithelial, germ cell and sex cord-stromal tumours. Ovaries are also affected by metastastic tumours. [1]
Epithelial tumours account for approximately 85 % of ovarian malignancy: the most common type is serous carcinoma. Dermoid cyst (mature cystic teratoma) is the most common benign ovarian neoplasm. [2]
Ovarian neoplasms may be benign, borderline or malignant and may appear on imaging as unilocular cyst, multilocular cyst, mixed cystic and solid, predominantly solid.
Although ovarian tumours have similar clinical and radiologic findings, each type may present predominant or specific key features. Even if there are many overlapping morphologic characteristics and corresponding imaging features, a thick, irregular wall, thick septa, papillary projections and a large soft-tissue component with necrosis are malignant features. [3]
Ultrasound (US) (performed with sovrapubic and/or transvaginal) is the first-line imaging investigation for the suspected adnexal mass for its low invasivity, high availability and low cost. It allows to investigate morphological features (such as cystic or solid components) and vascular characteristics on doppler exam.
Computed Tomography (CT) plays an important role in the staging of the disease (especially for metastatic disease) and in the evaluation after therapy, while it has a poor role in primary detection and characterisation of adnexal mass. It can be useful in masses wich contain calcifications and fat, such as teratomas.
Imaging of the indeterminate adnexal masses is one of the most common gynecologic indication for MRI and is often used in complex adnexal mass with malignant features, in pelvic mass of equivocal origin and in solid adnexal mass [4].
A MRI protocol to investigate adnexal mass comprises T1- and T2-weighted sequences to evaluate morphological features, T1 fat sat -weighted images to detect haemorrhagic or fatty areas and contrast-enhanced T1 sequences to evaluate solid components, enhancing septa and metastatic implants.
MRI is the most accurate modality in adnexal mass characterisation, and many of the benign adnexal lesions considered indeterminate at CT and US may be confidently diagnosed as benign with MRI [5]

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A28
Ovarian Cancer: Post treatment surveillance
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Ovarian cancer is the 6th most common cancer and 7th commonest cause of death in women worldwide. The surveillance of ovarian cancer patients after initial treatment is a challenging question in clinical practice. Several strategies have been employed following completion of primary treatment. Most treated women undergo long-term follow-up. Clinical examination, serum CA 125, physical examination, and imaging examinations have been employed with different schedules for follow-up . Although there are no consensus guidelines for surveillance, most recommend a pelvic examination every 2 to 4 months for the first 4 years after treatment and every 6 months for the next 3 years [1]. Imaging tests including x-rays, CT scans, MRI scans, ultrasound studies are used for investigating symptoms and rising CA125 levels [2,3]. It has been suggested routine imaging is not be effective in improving survival or quality of life and may not be cost-effective [4]. Varying surveillance strategies based on age, tumour subtype and stage, presenting and nadir CA125 levels have been proposed to direct surveillance strategies [5]. The application of