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Abstract Book

POSTER

A Complex Case of Unicentric Castleman's Disease

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Castleman's Disease (CD) is a rare lymphoproliferative disorder, first described by Benjamin Castleman in 1956[1]. CD is classified into two distinct clinical manifestations; unicentric Castleman's disease (UCD) or multicentric Castleman's Disease (MCD). Variability in manifestations of CD and infrequency of presentation results in difficulties with diagnosis and treatment. Treatment algorithms and prognoses differ greatly between the two types of CD. UCD commonly taking a benign form – with surgical excision the gold standard treatment, and MCD conferring a clinically aggressive disease with systemic symptoms[2].

A 42-year-old female presented with abdominal pain and night sweats. Radiological imaging showed a retrocaval mass measuring 6cm x 1.3cm x 3cm causing compression of the IVC. PET CT showed no other FDG avid tissues. Histological analysis of the mass biopsy cores showed lymph node tissue with regressed follicles, preservation of germinal centres, prominent interfollicular vascularity with some hyalinised vessels and focal plasmacytosis, positive for CD138. These findings were consistent with UCD. The mass showed significant compression of the posterior aspect of the IVC, with collateral vessels noted and IVC effacement. Due to location of the mass, surgical excision was not possible. The patient was treated with neoadjuvant Rituximab, 375 mg/m² weekly doses for one month. Follow up CT showed no significant reduction in size of the mass. The decision was made to commence radiotherapy, which is the recommended guideline for persistent symptomatic unresectable UCD. Imaging post radiotherapy showed a slight decrease in the retrocaval mass, 4.5cm x 2.3cm x 4.5cm, however with persistent abutment of the IVC. The case has been referred for consideration of surgical resection, however complexities remain regarding refractory treatment approaches.

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POSTER

LIRAGLUTIDE PLUS CALORIE RESTRICTION PREVENTS THE SPONTANEOUS DEVELOPMENT OF TYPE 1 ENDOMETRIAL CANCER IN BDII/HANS RATS

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Introduction:
Glucagon-like 1 peptide (GLP-1) based therapies may hold potential for the prevention and arrest of early-stage Type 1 endometrial cancer (EC1) We investigated the impact of the GLP-1 analogue liraglutide in combination with caloric restriction on tumor dynamics in the BDII/Han rat model of spontaneous EC1.

Methodology:
Twelve-month-old BDII/Han rats (n=38) were randomised to either *ad libitum* access to a standard rodent chow diet (STD n=17) or Liraglutide (1mg/kg/d) therapy plus 50% calorie (LIR-diet n=21). After 3 months, animals were euthanised and uterine horns retrieved to record tumour incidence and assess both tumour type and grade. Oestrus cycle stage was established via assessment of ovarian and endometrial histology.

Results:
The LIR-diet regimen resulted in 15% weight loss. Tumour incidence was 58% (10 of 17) in STD and 19% (4 of 21) in the LIR group ($p =$ 0.0184). In the STD group, 7 of the 8 tumours assessed histologically were EC1 type, with one animal developing a serous type tumour (EC2). All tumours in the LIR-diet group were EC2 type, as confirmed by p16 immunohistochemistry and were immune poor/excluded and CD8+ lymphocyte negative. LIR rats were predominantly arrested in diestrus (64%) and proestrus (29.4%), with follicular atresia frequently observed

Conclusion:
Liraglutide in combination with dietary restriction prevented the development of type 1 endometrial cancer-like disease in BDII/Han rats. Evidence suggests that the treatment also selected for the development of serous type, hormone-independent cancer in a smaller number of animals.

KEYWORDS: Endometrial cancer; Liraglutide; BDII/Han rats, GLP-1 analogue

POSTER

Incidence of atypical lesions in routine breast reductions warrants assessment of the feasibility of orientation and inking each specimen.

Tahmina Gul, Mary Leader.

Background:
The incidence of significant pathology in breast reduction specimens (BRS's) ranges from 0.06-4.6%. Some of these patients require further histological and clinical management. In 2002 the RCPath questioned the usefulness of pathology evaluation of BRS's. In 2008 RCPath recommended macroscopic evaluation and a minimum of two sections from BRS's. No guidelines recommend orientation or excision margin assessment by inking of specimens.
Management of patients with significant pathology on BRS's may be problematic for the following reasons: Location of the lesion in the breast to facilitate further sampling of the abnormal area, measurement of excision margins and review of pre breast reduction mammography where available. This study sets out the feasibility of orientation and inking of specimens to address some of the above issues.

Objectives:
To assess the feasibility of orientation and inking of BRS's.

Methods:
200 cases of BRS's were analysed retrospectively for significant pathology. The age ranged from 19-84 years with a median age of 41 years. Four sections were sampled from each breast specimen. Orientation and inking of specimens were instituted after the results of our audit.

Results & Recommendations:
Five of 200 cases (2.5%) showed a significant abnormality including 1 with atypical ductal hyperplasia, 3 with atypical lobular hyperplasia and 1 with high grade multifocal DCIS with cancerization of lobules over a span 0f 20 mms. The latter patient's specimen was not orientated or inked and prompted the use of inking in future specimens to assist patient management. This study found this procedure was simple and easily performed. We recommend this should be included in guidelines to benefit further sampling, exact localization of the lesion and its excision status and patient management.

ORAL PRESENTATION

ER-Positive Pitfalls – Think Outside the Breast

Lisa Comerford, Clare D'Arcy, Cecily Quinn, Aoife Maguire.
St. Vincent's University Hospital and Irish National Breast Screening Programme.

Abstract:
Oestrogen receptor (ER) is expressed in 70-80% of breast carcinomas but is not a specific marker of breast origin and expression is also common in gynaecological tract tumours and in some mesenchymal tumours. Our two cases illustrate potential "ER-positive traps".
1: A 76-year-old man presented with a right breast mass. Needle core biopsy (NCB) demonstrated a lesion composed of small, uniform, dyscohesive epithelioid cells with no significant cytonuclear atypia. The cells showed diffuse moderate ER-positivity, patchy CD34 expression and were negative for AE1AE3, STAT6, HER2, S100, SOX-10, SMA and CD45. The morphology and immunohistochemical profile were correctly interpreted as mammary myofibroblastoma, epithelioid variant. However, the single cell pattern, dyscohesive appearance and ER positivity may be mistaken for invasive lobular carcinoma.
2: A 58-year-old woman with an enlarged left supraclavicular lymph node (LN) had an NCB showing poorly differentiated carcinoma, diffusely ER-positive, weakly and focally GATA3 positive and TTF-1, Napsin, p63 and CDX2 negative, suggesting a diagnosis of metastatic breast carcinoma. NCB from an ipsilateral 12mm breast mass, identified on imaging, demonstrated invasive ductal carcinoma, grade 3, diffusely strongly ER-positive, with morphology broadly similar to the supraclavicular LN metastasis. Additional imaging demonstrated significant retroperitoneal adenopathy, prompting further work-up. The supraclavicular LN metastasis was WT1 and PAX8 positive with mutation pattern p53 staining, suggestive of high grade serous carcinoma of tubo-ovarian origin. These markers were negative in the primary breast tumour which showed diffuse, strong GATA3 expression. Diagnostic laparoscopy and bilateral salpingo-oophorectomy, performed following CT and PET that did not identify a primary tumour, revealed a 13mm high grade serous fallopian tube carcinoma confirming that the patient had synchronous breast and tubo-ovarian cancers.

POSTER

Characterization and upgrade rate of B3 (uncertain malignant potential) breast needle core biopsies performed at the BreastCheck Merrion Unit in 2021.

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2. St. Vincent's University Hospital and Irish National Breast Screening Programme.

Introduction: Needle core biopsies (NCBs) are categorised using the B system developed by the NHS Breast Screening programme. Lesions categorized as B3 may appear benign on NCB but have an increased risk of associated malignancy necessitating further sampling using vacuum assisted excision (VAE) or open surgical diagnostic excision biopsy (ExBx). The identification of malignant pathology following these procedures is termed the upgrade rate. Reported upgrade rates range from 3% to 28% with higher rates seen when epithelial atypia (EA) is identified on NCB.

Methods: Data on B categorization of all breast NCBs and outcome of subsequent histology sampling performed at the Merrion Breast Screening Unit in 2021 were collected from the Laboratory Information System. B3 NCBs were classified according to specific diagnosis and the upgrade rate calculated based on the subsequent pathology findings.

Results: 606 breast NCBs were categorised as: B1=41 (6.8%), B2=170 (28%), B3=75 (12.4%), B4=15 (2.5%), B5=305 (50.3%). B3 NCB diagnoses were: Radial scar (N=26, 4 with EA), atypical intraductal epithelial proliferations and flat epithelial atypia (N=19), lobular neoplasia (N=11), papillary lesions (N=8,1 with EA), cellular fibroepithelial lesions (N=5), mucocoele-like lesion (N=2,1 with EA), others (N=4). 65 patients had further sampling; ExBx in 51 (78.5%) and VAE in 14 (21.5%). Five of 65 women had malignancy on final histology (upgrade rate 7.7%). All 5 patients had EA on NCB.

Conclusion: The B3 incidence rate was 12.4% and the upgrade rate was 7.7%, consistent with BreastCheck standards and those from other screening programmes.

POSTER

2021 Audit of Endobronchial Ultrasound-guided Transbronchial Needle Aspirates in an Irish Lung cancer Tertiary Referral Centre

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Endobronchial ultrasound (EBUS) guided transbronchial needle aspiration is a minimally invasive technique used to investigate mediastinal and hilar lymphadenopathy. This retrospective audit of all EBUS guided samples collected between 1st January and 31st December 2021 assessed the diagnostic yield, adequacy, and malignancy subtypes detected by EBUS and use of rapid on-site evaluation (ROSE) in an Irish tertiary referral center.

212 lymph nodes were sampled in 168 EBUS procedures, representing 20% increase from 2020 (140 EBUS). Mean patient age was 60.7 years and 41.4% (69/168) female. ROSE was performed in 89.9% (151/168) of cases, with a positive yield in 84.5% (142/151). Overall inadequacy rate was 6.5 % (5% in 2020).

EBUS malignancy rate was 37.5% (63/168) overall and 56% (61/109) in cases of suspected malignancy or staging, with pulmonary adenocarcinoma being the most common subtype (28.6%). Granulomas were observed in 24.4% (41/168) of EBUS procedures overall, and in 69.4% (25/36) of EBUS procedures performed for investigation of sarcoidosis.

EBUS is effective for the diagnosis of both malignant and non-malignant disease with excellent adequacy rates and provides source material for molecular analysis. EBUS and malignancy rates increased, while ROSE rates slightly decreased in 2021, and overall inadequacy rate was slight higher.

POSTER

Comparison of Different Ki67 Antibody Clones and Hotspot Sizes for Assessing Proliferative Index and Grading in Pancreatic Neuroendocrine Tumours using Manual and Image Analysis

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Aims: Ki67 proliferative index (PI) is essential for grading gastroenteric and pancreatic neuroendocrine tumours (GEP NETs). Analytical and preanalytical variables can affect Ki67 PI. In contrast to counting methodology, until now little attention has focussed on the question of clone equivalence and effect of hotspot size on Ki67 PI in GEP NETs. Using manual counting and image analysis, this study compared the Ki67 PI achieved using MM1, K2 and 30-9 to MIB1, a clone which has been validated for, and is referenced in guidelines relating to, assessment of Ki67 PI in GEP NETs. Methods and results: 42 pancreatic NETs were each immunohistochemically stained for the anti-Ki67 clones MIB1, MM1, K2 and 30-9. Ki67 PI was calculated manually and by image analysis, the latter using 3 different hotspot sizes. In manual comparisons using single hotspot high power fields, non-MIB1 clones overestimated Ki67 PI compared to MIB1, resulting in grading discordances. Image analysis shows good agreement with manual Ki67 PI but a tendency to overestimate absolute Ki67 PI. Increasing the size of tumour hotspot from 500 to 2000 cells resulted in a decrease in Ki67 PI. Conclusion: Different anti-Ki67 clones do not produce equivalent PIs in GEP NETs and clone selection may therefore affect patient care. Increasing the hotspot size decreases the Ki67 PI. Greater standardisation in terms of antibody clone selection and hotspot size is required for grading GEP NETs. Image analysis is an effective tool for assisting Ki67 assessment and allows easier standardisation of the size of the tumour hotspot.

POSTER

Cytoplasmic p53 staining in gastrointestinal and pancreaticobiliary neoplasia. An under recognised aberrant immunopenotype: a report of 3 cases.

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Mutations in TP53 leading to a loss of its tumour suppressive functions are the among the most commonly detected mutations in human cancer. The use of optimised immunohistochemistry (IHC) for p53 has been validated as an accurate predictor of the presence of TP53 mutations. Two nuclear patterns of staining are commonly recognised as indicative of mutation status within the gastrointestinal tract; namely nuclear overexpression or diffuse strong staining and complete absence of staining, referred to as a null type staining pattern . Within the cancers of female genital tract, including ovarian high grade serous carcinomas, vulval carcinomas and endometrial endometriod carcinoma, a third pattern of cytoplasmic mutation staining is well described with a resultant mutation in TP53 confirmed. There are only limited reports in older studies describing this aberrant staining pattern in gastrointestinal malignancy, in particular colorectal adenocarcinoma, in which it may relate to a worse prognosis. Herein we report three cases where strong cytoplasmic p53 immunostaining was identified within the gastrointestinal tract, including an oesophageal adenocarcinoma, a pancreatic adenocarcinoma and in a colonic sessile serrated lesion with dysplasia. To our knowledge this is the first time that this pattern has been described in any of these 3 types of lesions. As a rare staining pattern, we speculate that it is under recognised in gastrointestinal and pancreaticobiliary pathology.

POSTER

An unusual case of metastatic cutaneous basal cell carcinoma to the lung: A case report

Dr Niall Corry, Dr Louisa Miller and Dr Graeme O'Hara

Introduction

Cutaneous basal cell carcinoma (BCC) is the commonest cancer worldwide accounting for over 80% of skin cancers. Conventionally BCC is considered to be locally aggressive, it may locally reoccur but metastases are extremely rare occurring in less than 0.55% of cases.

Case Description

In this unfortunate case, a 52 year old gentleman developed breathlessness following an episode of COVID-19 infection, on attendance to A&E a CT scan was arranged to exclude pulmonary embolism, which coincidentally revealed bilateral lung soft tissue masses. Subsequent core biopsy demonstrated a basaloid carcinoma of uncertain origin. Correlation with the morphology of an ensuing cutaneous BCC, immunohistochemistry and imaging findings, led to the resultant diagnosis of metastatic basal cell carcinoma (mBCC) to the lungs.

Discussion

Risk factors for mBCC include the size and duration of cutaneous BCC, particularly when left untreated for a number of years. Of note, the patient had a history of sunbed and melanotan usage. mBBC has an extremely poor prognosis with a median survival of 10 months after diagnosis of metastasis and a dismal response to both chemo and radiotherapy. Histopathological morphological features of mBCC are variable but commonly include; basaloid cells, peripheral palisading, retraction artefact and a myxoid stroma, rarer findings include focal squamoid and pseudoglandular changes. Given the variable morphology of mBCC comparison with concurrent cutaneous BCC is critical.

Conclusion

This case highlights mBCC which due to its rarity and diverse morphology could be overlooked in the differential of carcinoma of unknown primary origin. mBCC bears consideration in patients with a history of basal cell carcinoma and perhaps a thorough dermatologic examination could be contemplated in patients with risk factors.

POSTER

Giant cell tumour of rib, a rare site

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Introduction:

Giant cell tumours of bone (GCTBs) are rare and account for 5% of all primary bone tumours. GCTBs are usually benign locally aggressive tumours, 95% of which harbour a H3F3A gene mutation (90% being H3.3 G34W variant). They tend to occur in the epiphysis and metaphysis of femur and tibia of young adults. Only 1% of GCTBs arise from the ribs. We present a case of GCTB occurring in the rib highlighting the importance of correlation with radiological findings and use of molecular findings in diagnosis.

Case Presentation:

We report a case of 26 year old male who presented with a 3 month history of a left flank soft tissue mass. A core biopsy was taken. Histologically, this revealed a giant-cell-rich neoplasm and the differential diagnosis included giant cell tumour and osteosarcoma, however the site was not typical for either. CT and MRI of chest illustrated an 11cm mass arising from the lateral aspect of 12th rib abutting the left kidney. A resection was performed which confirmed the presence of a giant cell tumour arising from 12th rib. Immunohistochemistry performed at an outside institution was strongly positive for H3.3 G34W confirming the diagnosis.

Discussion:

GCTB are rare tumours of bone that usually affect appendicular bones, only rarely affecting axial bones such as the ribs as in this case report. The differential diagnosis of such rib lesions would include fibrous dysplasia, eosinophilic granuloma, brown tumours, enchondroma, plasmacytoma, chondrosarcoma and metastasis, thus requiring close correlation with clinical and radiological findings. The use of H3.3 G34W mutant-specific antibodies can be useful in diagnosing giant cell tumour of bone as we observed in this case. The ultimate treatment is surgery enabling definitive histopathological diagnosis and evaluation of margin status.

POSTER

Interpreting disconcordant *HER2* status between IHC, ISH and RT-PCR in invasive breast cancers

D. Egong, G. Callagy, S. Hynes, H. Ingoldsby, A. O'Keefe, S. Phelan, A. Shalaby, M. Sheehan, B. Tietz, C. Brodie

Introduction and aim

Identification of *HER2* expression in invasive breast cancers helps guide patient management. Equivocal cases by immunohistochemistry (IHC) are followed by *in-situ* hybridisation (ISH) for definite *HER2* identification. Oncotype DX recurrence score predicts the benefit of adjuvant therapy in select patients and reports their *HER2* status obtained via RT-PCR. We encountered two cases of *HER2* status disconcordance between different modalities in 2022, prompting a review of past cases within our centre to discuss possible causes of these discrepancies.

Methods

IHC, ISH and Oncotype DX *HER2* results were extracted from 2388 breast cancer Histopathology reports (January 2019 to May 2022). The proportion of *HER2* positivity by IHC/ISH was calculated. Discrepancies reported by all three modalities were highlighted for discussion.

Results

HER2 positivity from all biopsy-identified cases in 2019 was 14.4%, 16.0% in 2020, 17.4% in 2021 and 18.1% in 2022. One case in 2019 had positive IHC but negative ISH (performed for quality control). Two cases (one in 2020, one in 2022) had negative IHC but ISH returned positive. In 2022, a case was initially negative by IHC and ISH but positive by RT-PCR (Oncotype DX). Re-analysis of the tumour confirmed heterogeneous *HER2* status, with *HER2*-positive loci alternating with *HER2*-negative loci within the same tumour.

Conclusion

Our *HER2* positivity rates conform to international data of 14.4–20.0%. Disconcordant *HER2* status between different modalities is acknowledged within the literature, with 5% of cases exhibiting IHC/ISH disconcordance, sometimes due to mis-packaging or truncation of Her2 preventing membranous expression. These possibilities may be explored by genetic sequencing. Tumour heterogeneity is an important potential cause of ISH/RT-PCR *HER2* status discordance.

POSTER

Frequency and prevalence of molecular alterations in non-small cell lung cancer (NSCLC)

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Background:

Primary lung cancer remains the most common malignancy after non-melanocytic skin cancer. In Ireland it is the fifth most common type of cancer with an estimated 2,690 average annual diagnoses. NSCLC accounts for 80%–90% of lung cancers and with the constant advancements in targeted therapies and immuno oncology (IO) it is crucial to accurately identify potential treatment targets.

Aims:

1. Identify the frequency and prevalence of molecular alterations in NSCLC
2. Identify the frequency, prevalence and PD-L1 score in this patient cohort

Methods:

Retrospective review of 155 authorised pathology reports. 75(tissue confirmed), 80(cytology confirmed) between 01/01/2018 – 01/02/2022.

Results:

155 patients, 100(65%) male, mean age 69. 55(35%) female, mean age 68. Predominant histological type was adenocarcinoma 122(78%) squamous cell carcinoma 13(8.5%) and other mixed types 20(13.5%).

70(45%) patients had no detectable molecular alteration while 85(55%) had a confirmed molecular alteration. Highest frequency of mutations was associated with adenocarcinoma. 45(29%) KRAS , 19(12%) EGFR. Only 1 patient with squamous cell carcinoma, and 1 patient in the mixed type group showed an EGFR mutation. 44(28%) had a PD-L1 score <1% with 9(6%) having insufficient material for analysis. 102(66%) had a score of 1% or greater. 40(26%) had a PD-L1 tumour proportion score of ≥50%.

KRAS – 45(29%), EGFR – 22 (14%), BRAF V600 – 5(3%), BRAF Lys600Glu – 3(2%), NRAS – 3(2%), ALK – 3(2%), ROS1 – 2(1%), MET – 1(1%), PIK3CA – 1(1%)

Discussion and Recommendations:

In the era of precision medicine it is exceedingly important to identify potential targets for treatments and inclusions into clinical trials. The future of this project is to expand and prospectively maintain the database.

ORAL

Factors affecting tumour cell counts for Molecular Pathology

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Department of Pathology University of Galway

In an era where digital pathology solutions have the potential to augment or replace, traditional pathology techniques it is important to be aware of any limitations that may influence the technologies' ability to function optimally. In order for technological advancements to be truly beneficial and improve patient outcomes they must out-perform their human counterparts. Understanding how the image analysis software processes the digital image of the histological section and what factors affect its ability to identify tumour is crucial in understanding how we may employ the technology in the clinical setting. One factor that may affect performance is section thickness as highly cellular, thick sections with high levels of background noise may impair accurate cell detections. Additionally, haematoxylin and eosin (H&E) staining, which has been the preferred method for visualising cellular and extracellular matrix components for at least a century, may also be a limiting factor. The aim of this study was to analyse the effect of section thickness and staining (H&E versus haematoxylin only staining) on whole slide cell detection and tumour percentage using QuPath, an open-source digital pathology software. Two blocks, one colorectal cancer (CRC) and one malignant melanoma (MM) were irrevocably anonymised and supplied to the student. Two 3µm, 4µm and 5µm sections were cut from each block and stained. One section from each thickness group was stained with H&E, the other was stained with haematoxylin. Scanned, whole slide images were analysed on QuPath. Classifiers were created for each image to detect the number of tumour, stromal (all other cell types) and necrotic cells. Our study showed that classifiers created for a specific section thickness cannot be applied to sections of different thickness with confidence as classifiers designed specifically for that section thickness will produce different results. Staining sections with haematoxylin only compared to traditional H&E methods produced different cell detection results within the same thickness group. Classifiers created on an image with one staining technique cannot be used to accurately detect tumour in an image of the other staining type. We conclude that section thickness and staining affects the percentage of tumour cells detected when whole slide images are analysed using digital pathology methods.

Poster

Conjunctival Melanoma in Ireland – A Sixty Year Review

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Background & Objective

Conjunctival melanoma is a rare ocular neoplasm with an unpredictable pathological course. Reported incidences vary from 0.1–0.9/1,000,000. Lack of population studies coupled with the rarity of the tumour has resulted in poor understanding of risk-factors and limited therapeutic options.

Methods

A retrospective review of all cases of conjunctival melanoma accessioned in the largest eye unit in Ireland over a 60 year period(1961 – 2021) was performed. The age, sex, eye laterality, size of tumour, development of metastasis and/or recurrence was determined. Genome sequencing was performed on samples and mutations found recorded.

Results

74 cases of conjunctival melanoma were diagnosed since 1961. There was a female preponderance(n=39,52.7%). Median age of diagnosis was 72(Range:32-91). Tumour size varied from 5–56mm. Thirty-six(49.3%) have died. Time of death ranged from 1 month to 12 years post diagnosis. 17(22.9%) developed metastases (brain, lung, liver, kidney, bowel, thyroid, prostate, parotid, lymph nodes), 24(32.4%) developed recurrences. The right eye was more commonly affected (n=39,52.7%). 31 of 74 specimens dating back to 1996 were sent for analysis using Sequenom or Oncomine platforms. Mutations were detected in 17 patients. These included BRAF, PHLPP2 L10165, PIK3CA H1047Y and NRAS.

Conclusion

Conjunctival melanoma is a rare neoplasm with only 74 cases diagnosed in the last 60 years. Recurrence and metastases are common. Options for treatment of conjunctival melanoma include excision, cryotherapy, corneal epitheliectomy, radiotherapy and topical mitomycin C. Adjuvant therapy is limited, with conjunctival melanomas showing intermediate sensitivity to immunotherapy. Extended follow up of patients will allow identification of risk factors for the disease, while further genetic sequencing will enable identification of potential therapeutic targets.

POSTER

Tissue Adequacy and Indication Appropriateness of Native Medical Renal Biopsies at Galway University Hospitals: An Audit

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The native medical renal biopsy is the gold standard investigation for determining diagnosis, treatment and prognosis in medical renal disease. However, it has several limitations, such as obtaining adequate tissue for diagnosis and a lack of evidence on which the indications for performing it are based. To counter these limitations, standards and guidelines on the medical renal biopsy have been devised. The Royal College of Radiologists of the United Kingdom have developed a standard of >75% for tissue adequacy. To date, only one set of evidence-based guidelines on indications for native medical renal biopsies have been produced. These indications include nephrotic syndrome, isolated microscopic haematuria, acute kidney injury, chronic kidney disease and certain scenarios in those with diabetes mellitus. Since tissue adequacy determines the diagnostic accuracy of medical renal biopsies and evidence-based indications guide appropriate biopsies, thereby optimising patient outcomes and reducing inefficiency in funding and staffing of services, this study audited the adequacy of tissue for diagnosis and the alignment of indications for native medical renal biopsies with evidence-based guidelines over 1 year at our institution (Galway University Hospitals). To do so, all patients who had undergone native medical renal biopsies in 2021 were identified. As per Royal College of Radiologists Guidelines, a 1-year period was chosen for audit. 62 patients were identified. Of these, 60 (97%) had biopsies with sufficient tissue for diagnosis and 43(69%) had evidence-based indications for biopsy. In conclusion, native medical renal biopsies at Galway University Hospitals in 2021 exceeded the tissue adequacy target of the Royal College of Radiologists and the majority had an evidence-based indication.

POSTER

Audit of cell differentials/counts and CD4:CD8 immunohistochemistry, in bronchoalveolar lavage specimens.

Dr Helena Devenney

Introduction: Bronchoalveolar lavage specimen sampling, is a useful tool in pulmonary pathology diagnosis and differential diagnosis.
Aims: The aim of this study is to examine the total BAL specimens submitted for cell differentials. Specifically, the purpose is to examine the number of specimens deemed unsuitable for further cell differentiation, the number of CD4:CD8 immunohistochemistry required and performed, the workload generated, and the respective clinical details provided. This audit examines all BAL specimens received by the Tallaght University Hospital department from January 2021 - January 2022.
Methods: A retrospective review of all BAL reports was carried out using a system-generated list of all specimens, under the appropriate SNOMED coding category (T2Y414), for a 12-month period (January 2021 - January 2022). This included examining all specimen reports and did not include a review of slides.
Results: A total of 434 bronchial cytology specimens were received, within the 12-month period. Cell differentials were carried out on 106 specimens (24.4%). A total of 67 of these specimens were explicitly deemed unsuitable (63.2%). CD4:CD8 was performed on 19 of the samples meeting the criteria for immunohistochemistry (4.4%). No clinical details were provided for 27 samples.
Conclusion: Increasing recognition of the suitability of specimens submitted for cell differentials, may be an important means of closing the gap between the overall workload, and the yield of completed immunohistochemistry results.

POSTER

An audit of sentinel lymph node positivity rates in cutaneous malignant melanoma

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Background: Sentinel lymph node biopsy (SLNB) is an important prognostic determinant in malignant melanoma. 1 It is recommended that patients with melanomas greater than 1mm and stage IB-IIC should be offered sentinel lymph node biopsy (SLNB). 2 The Royal College of Pathologists (RCPath) recommend the use of the EORTC Melanoma Group protocol for SLNB handling, which has shown a SLNB positivity rate of between 25 and 33%. 3 The EORTC Melanoma Group supports the use of S100 for immunohistochemical examination, however other markers such as SOX10 or Melan A are also accepted.2

Aim: To assess cutaneous melanoma SLNB handling and SLNB positivity rates within our department, and to determine if these are comparable with RCPath recommendations.

Methods: All cases of malignant melanoma who had SLNB performed between 2015 and 2021 were identified by SNOMED code (M87203). All sentinel lymph node specimens where handled according to the sentinel lymph node melanoma protocol as follows: each lymph node is bivalved and each surface is examined microscopically, with six pairs of sections taken at 50 micron step intervals.

Results: Fifty-six SLN biopsies were performed between 2015 and 2021. Of these, twenty-nine biopsies were positive for metastatic melanoma, corresponding to a positivity rate of 51.8%. In twenty-six of the positive cases, metastatic melanoma was diagnosed on hematoxylin and eosin (H&E), and immunohistochemistry was used to confirm the diagnosis in all of these cases. In three of the positive cases, metastatic melanoma was not identified on H&E but was diagnosed following immunohistochemical examination with S100, Melan-A and HMB-45.

Conclusion: The findings are in keeping with recommendations from RCPATH and support the continuation of the current protocol in use for the handling and assessment of SLN biopsies.

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ORAL

Biomarker changes after Neoadjuvant Chemotherapy in Breast Cancer

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Introduction: Changes of hormone receptor and HER2 phenotype may occur after neoadjuvant chemotherapy (NACT) for breast cancer (BC), due to tumour heterogeneity, NACT-related selective pressure, and technical issues, including both pre and post-analytical variables. Currently, there is no consensus regarding biomarker reassessment on residual tumour post-NACT. We wished to determine if repeating biomarkers in this setting identifies clinically actionable changes.

Methods: We conducted a retrospective review of BC patients who received NACT followed by definitive surgery from 2019 to 2021. We compared biomarker profile (oestrogen receptor [ER], progesterone receptor [PR], and HER2/neu [HER2]) on pre-treatment needle core biopsies to profile of residual tumour after NACT.

Results: We identified 182 NAC-treated cases. Complete pathological response was seen in 54 cases (30%) and biomarkers were not repeated in 7 cases (4%) with scant residual tumour. Repeat biomarker testing was performed on the surgical specimen in 121 cases (66%). In 24 of 121 cases (20%) there were changes in pre-NACT biopsy versus post-NACT resection biomarker status. PR changed in 12/24 cases (10 cases positive to negative; 2 cases negative to positive, 1 of which also expressed ER). ER changed in 6/24 cases (4 positive to negative; 2 negative to positive). Changes in both ER and PR were identified in 1 case (positive to negative). Her2 status changed in 5/24 cases (2 negative to positive and 3 positive to negative).

Conclusions: Change in biomarker status post-NACT was identified in 20% of cases with a tendency towards decreased expression. In 5 cases (4% of cases tested) we identified a positive change in biomarker status (2 cases with Her2-positivity, 3 with hormone receptor positivity) with potential to introduce new adjuvant treatment options.

Audit of Core Biopsy Diagnosis of Breast Lesions

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Introduction

Core-needle biopsy (CNB) is a crucial investigation in the assessment of screen-detected breast lesions. The Royal College of Pathologists (RCPath) offer guidelines for the reporting of breast CNB. Each step of this system has differing diagnostic and therapeutic implications, including the need for additional tissue to be collected in some instances. Acurately categorising each lesion is extremely important in the patient treatment pathway and preventing overtreatment.

Methods

Retrospective audit of 111 breast CNB specimens collected from an electronic histopathology log from a large tertiary hospital between January to December 2021. Data collected was compared with the RCPath guidelines including B-category classification, histological type & grade, hormone receptor status and molecular result. Target level for each point was 95%.

Page Break

Results

	% compliance
B-category given	*100%*
Histological type	*100%*
Histological grade	*100%*
Oestrogen receptor status	*99%*
Oestrogen receptor - % positive cells	*99%*
HER2 final status	*96.3%*
HER2 immunohistochemistry score	97.2%
HER2 in-situ hybridisation result	96.3%

Of 111 breast CNB in this audit, 100% of reports included a B-category and the histological type and grade of each lesion. Oestrogen receptor status was unassessable for one case due to poor fixation. HER2 status was unassessable in 4 cases due to insufficient remaining tissue (3 cases) and poor fixation (1 case).

Conclusion

Eight dataset points were above the 95% target, with 3 points achieving a 100% mark. Assuring physicians take adequate volume CNB should limit cases of insufficient tumour material for receptor testing. The ASCO–CAP HER2 guidelines dictate specimens require between 6-72 hours fixation to ensure optimal HER2 testing. A future audit may address the average volume of tissue taken via CNB and average specimen fixation time for receptor status testing.

ORAL

Histopathological Reporting Word Count

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Introduction

It is accepted that the word count and complexity of histopathological reports has increased sharply over time, particularly over the last 30 years. This study compares the wordcount difference in histopathological reports from 1993 to 2019 in a tertiary Irish hospital.

Methods

The first 20 reports per 1000 in 1993 and 2019 were examined. In total, 180 histopathology reports from 1993 and 360 reports from 2019 were included. Data collected included wordcount for clinical details, macroscopic examination and microscopic reporting. Number of biopsies and resections, blocks per case, specimen organ type and case outcome were also recorded.

Results

Of the reports studied, the average wordcount nearly doubled from 1993 to 2019 (51 words vs 97 words). The macroscopic wordcount average increased from 26 words to 42 words, average clinical details increased 6.5 words to 10 words and average microscopic words increased from 18.5 to 44.5. Block numbers per case increased by 132% from 2.55 blocks per case to 3.336 per case. There was an increase in biopsies from 52.78% of sample cases in 1993 to 64.44% of sample cases in 2019. Resections decreased from 42.78% of 1993 sample cases to 35.28% of 2019 sample cases. Benign specimens decreased from 79.44% of all 1993 sample cases to 74.14% of all 2019 sample cases. Malignant specimens amongst resection cases increased from 12.99% of 1993 sample cases to 34.43% of 2019 sample cases. Breast specimens increased from 6.67% of 1993 sample cases to 17.78% of 2019 sample cases

Conclusion

Due to the development of datasets, minimum reporting data and reporting templates, an increase in report wordcount was inevitable. The increase in block numbers and specimens by category is in keeping with trends reported nationally.

POSTER

An Audit of the Departmental Performance of Immunohistochemistry on Hepatocellular Carcinoma Specimens over a 2 Year Period (2020-2021)

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Background/Objectives:
Hepatocellular carcinoma (HCC) is a primary liver malignancy of hepatocellular differentiation. As advised in the 2019 WHO Classification of Digestive System Tumours, an immunohistochemical (IHC) panel of Glutamine Synthetase (GS), Glypican 3 (GP3) and HSP70 that shows positivity in at least 2 of these 3 immunostains has 72% sensitivity for HCC and almost 100% specificity. Our aim is to analyse the use of the WHO recommended panel of GS, GP3 and HSP70, in association with HepPar1, reticulin and CD34 in the diagnosis of HCC in our department.

Methods:
A list of all cases of HCC diagnosed histologically (2020/21) was compiled using the hospital laboratory data system, and all external cases were excluded (n=93).

Results:
93 specimens showed hepatocellular carcinoma (20 liver explants, 22 segmentectomies, 1 central excision, 50 biopsies). GP3 was performed in 71% of cases, GS:66%, HepPar1:55%, and in resection specimens, reticulin:35% and CD34:28%. Since the introduction of HSP70 to the department in March 2021, the stain was performed in 74% of cases. 10 cases had one or more of the audited immunostains performed on the pre-resection biopsy to diagnosis HCC; 65% showied positive staining in 3 or more of the IHC panel.

Conclusion/Recommendations:
The WHO-recommended panel to aid diagnosis of hepatocellular carcinoma on resection specimens was variably used in the department during 2020 and 2021. It is likely that the covid pandemic impacted diagnosis during 2020. The IHC panel is most useful in the biopsy settting with small tissue samples when diagnosis is challenging. We recommend departmental education on this subject and reaudit in one year.

ORAL

THE POWER OF CYTOLOGY; A DIAGNOSTIC AND THERAPEUTIC PARADIGM SHIFT

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Lung cancer is the leading cause of cancer related death worldwide. 70% of cases are inoperable at diagnosis, therefore respiratory cytology specimens represent crucial sources of tissue. The use of cytology has expanded beyond the diagnostic sphere to also encompass a key role in therapeutic molecular studies. Our aim was to demonstrate the diagnostic and therapeutic value of respiratory cytology for patients with lung cancer.

We analysed all respiratory cytology specimens received at out institution between 2020 and 2021. We recorded the number of malignant specimens, their concordance to available biopsies and whether they were used to perform therapeutic molecular studies.

1432 respiratory cytology specimens were analysed. Of these, 15.6% (n=223) were malignant. Of the 223 malignant specimens, 61% (n=136) were non-small cell lung cancer (NSCLC), incorporating 102 patients. Of these patients, 37.3% (n=38) has molecular studies successfully performed on cytology specimens with another 14.7% (n=15) having PD-L1 studies alone performed. Of the 136 NSCLC specimens, 79.7% of cytology specimens with a corresponding biopsy successfully classified NSCLC into adenocarcinoma or squamous cell carcinoma.

Our study highlights the value of respiratory cytology as an effective diagnostic and therapeutic tool, showing value in both classifying NSCLC and in performing essential molecular studies.

POSTER

Mediastinal Gray Zone Lymphoma: A Clinicohistological Conundrum

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Mediastinal Gray Zone Lymphoma (MGZL), known previously as B-cell lymphoma, unclassifiable, with features intermediate between Diffuse Large B-cell Lymphoma (DLBCL) and Classical Hodgkin's Lymphoma (CHL), is a rare form of lymphoma typically affecting young male patients. It has features of both Primary Mediastinal B-cell Lymphoma (PMBL) and CHL and tends to be more aggressive than either disease.(1)(2)

We present the case of a 24-year-old woman who was referred to the Haematology Department with cervical lymphadenopathy. PET revealed multiple intensely metabolically active nodes, including central mediastinal nodes and an anterior mediastinal mass.

She underwent core biopsy of a neck node but histology was inconclusive; the morphology was suggestive of CHL however classical Reed-Sternberg cells were not present and there was strong positivity for CD20 and CD79 and a high proliferation index with Ki67. Subsequent excision biopsy showed nodal tissue with architecture effaced by atypical lymphoid proliferation of large cells consistent with Reed-Sternberg cells focally forming sheets in a background of eosinophils, plasma cells and small lymphocytes. The neoplastic cells stained strongly with B-cell markers. O'Malley criteria can be utilised for scoring of immunostaining and this favoured B-cell lymphoma over CHL.(3)

Diagnosis was made after many weeks and after seeking expert opinion.

She was commenced on Rituximab, Cyclophosphamide, Doxorubicin, Vincristine, Prednisolone (R-CHOP) chemotherapy. MGZL can be relatively chemo-resistant and she will be considered for consolidative radiotherapy.(4)

We chose to present this case to demonstrate the challenges associated with correctly diagnosing MGZL, delays in which can be a major cause of patient anxiety. Ultimately, the best treatment is currently unknown.(5) Cases like ours highlight the need for further study.

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ORAL

Diagnostic utility of ancillary cell block preparations in endoscopic ultrasound guided fine needle biopsies of the pancreas

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Endoscopic ultrasound guided fine needle biopsy (EUS FNB) is becoming the gold standard for diagnosing pancreatic malignancies. This is still an evolving technique both in terms of the methods used to process the samples, and the experience of those taking the samples. Anecdotally, the quality of the samples received in our department has improved since the technique was introduced in 2017. Our current practice is to remove intact cores identified grossly and process them for histology, before cytospinning the remaining fluid to form a cell block. Noting the improving sample quality, we sought to evaluate whether default ancillary cell blocks are still of diagnostic utility in all cases. We reviewed 50 consecutive EUS FNB samples from patients with suspected malignant tumours. We evaluated the proportion of diagnostic material available in the cell block (based on measuring intact stromal cores and fragments) and assessed if the cell blocks were required to establish the diagnosis, and if the cell blocks were suitable for molecular analysis (based on the presence of at least 200 neoplastic cells). Our results demonstrate that in the majority of cases only a small proportion of the intact stromal material was represented in the cell block, and in rare cases the cell block was required to make the diagnosis. However, a slightly higher proportion were deemed suitable for molecular analysis. We conclude that the routine processing of cell blocks is not necessary in all cases and can be reserved for fragmented or low cellularity specimens, or upon request by the examining pathologist if the cores identified grossly have proved non-diagnostic.

POSTER

Spindle cell lesions arising in the caecum

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A range of mesenchymal tumours occur in the caecum. Apart from lipomas these tend to be rare and have a spindle cell morphology . Tumours including gastrointestinal stromal tumours (GISTs), leiomyomas, ganglioneuromas, and more rarely, leiomyosarcomas occur. GISTs should always be considered in the differential diagnosis of caecal spindle cell tumours. It is necessary to differentiate other caecal mesenchymal tumours from GISTs using morphology, immunohistochemistry and less commonly, molecular analysis.

Herin, we report two unusual cases of spindle cell lesions arising in the wall of the caecum.

Case 1

A 52 year old lady was admitted from accident and emergency with acute abdominal pain. Imaging did not report any significant findings. Routine bloods revealed an iron deficient anaemia and an elevated QFIT 171. Subsequently, outpatient endoscopy was preformed. A 35 mm polypoidal tumour filling the lumen of the caecum was found. Biopsies of the lesion revealed a spindle cell lesion with an immunophenotype in keeping with a smooth muscle neoplasm. The patient subsequently proceeded to laparoscopic right hemicolectomy. The final pathological diagnosis was a leiomyosarcoma in the caecum arising in the muscularis mucosa.

Case 2

A 69 year old female with a history severe ulcerative colitis (UC) and failed medial management underwent a laparoscopic total colectomy and end ileostomy for symptom control. Incidentally, a 2.2cm polypoid extra-luminal tumour was seen at the caecal pole. The tumour had a homogenous and pale cut surface. Histological examination of the tumour revealed a mixed spindle and epithelioid cell tumour, with an immunophenotype consistent with a GIST. Subsequent molecular analysis identified an exon 11 mutation in the KIT gene.

Conclusion

The cases described are unusual tumours arising in the caecum. This shows the importance of morphology and immunohistochemistry in defining a differential diagnosis of a spindle cell lesion within the caecum.

POSTER

Introducing Augmented Reality to Pathology Teaching

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Background: Augmented reality (AR) is an exciting technological advancement which allows for the creation of a highly interactive, engaging learning environment by virtually supplementing reality and encouraging self-directed learning. However, it has not yet been adopted for use in the teaching of pathology. Machine learning (ML) software can be used to train models to accurately identify pathology. Our aim with this study is to create an application to incorporate these previously unused technologies into pathology education.

Methods: Encased 'pots' containing pathological specimens were used to train the machine learning model. VSCode, Android Studio, Flutter and Github were used to develop the AR application. A Flutter project was created in VSCode. Firebase, a cloud database platform, was integrated to train the ML model. We attempted to create a model based on object recognition, but reverted to a more straightforward model using Google's ML kit test detection feature to recognise the code on each pot. PDFs containing information about each specimen were created, which the user is navigated towards upon recognition of a specimen.

Results: We demonstrated that augmented reality can be utilised in pathology education, including potentially revitalising the use of pots at medical institutions. The AR application can be used by students, making tutorials more interactive.

Conclusions: In this project, we created a basic augmented reality application based on text recognition. We illustrated that novel technologies can be employed to foster the continued use of pots in pathology teaching. In the future, we hope to create an application that can independently recognise pathologies. Our study was limited, but has exciting implications, as it paves the way for future developments in medical education using more advanced ML and AR technology, which can be translated into any discipline.

POSTER

Idiopathic Granulomatous Mastitis (IGM)- A Diagnostic Challenge

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Introduction Idiopathic Granulomatous Mastitis (IGM) is a rare, benign, inflammatory breast disorder of unknown aetiology. It typically presents in parous women with a recent history of lactation. Differential diagnoses include breast malignancy and granulomatous diseases. The pathological criteria for diagnosis of IGM includes granulomatous inflammation with the presence of multinucleated giant cells and fat necrosis, abscesses, sinus tract and eosinophils.

Methods
All clinically detected cases of idiopathic granulomatous mastitis over a 5 year period (2017-2022) were identified using HIPE data. Patient demographics, clinical and radiological data as well as histology and microbiology results were recorded.
A retrospective review was undertaken of the histological features including;
1. Periductal or perilobular inflammation
2. Sheet like or well formed granulomas
3. Presence of neutrophils/eosinophils
4. Presence of necrosis
5. Special stains

RESULTS
The average age of patient was 44.9. A new breast lump was the most common clinical presentation, 72.5% of patients (n=29). 61% of samples were biopsies of the left breast (n=25), with the remainder (n=15) from the right. 19.5% (n=8) were post-partum within 24 months from presentation. 14.6% (n=6) were current smokers. 2 patients had a history of diabetes mellitus. All were R2 lesions.
All 40 samples sent for histological analysis had granulomatous inflammation present. 32 were described as in sheets, 7 well-formed, and 1 combination of both. Neutrophils were seen in 34 samples, foreign body giant cells seen in 29, histiocytes seen in all 40 samples, and necrosis was visualised in 2 samples only. A positive gram stain was reported in 2 samples, which correlated with microbiology results.

Conclusion
IGM is difficult to distinguish clinically from other inflammatory breast diseases or cancer. Clinicopathological correlation with radiology and microbiology are important, but the gold standard of diagnosis remains with histopathology.

POSTER

Value of Long-term Follow-up in Surgically Excised Lesions of Uncertain Malignant Potential in the Breast - Is 5 Years Necessary?

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Introduction: B3 lesions are a heterogeneous group of breast lesions of uncertain malignant potential which usually require excision. The aim was to assess the efficacy of 5 years routine radiological or clinical follow-up of patients with "high-risk" B3 lesions surgically excised, by analyzing recurrence and subsequent development of invasive/in-situ cancer.
Methods: A 10-year retrospective review (2010 to 2019) was performed of B3 lesions diagnosed on core needle biopsy, including patients who proceeded to surgical excision with a high-risk lesion on histology. The database recorded 6 specific B3 lesion categories: Atypical ductal hyperplasia (ADH), Radial scars/complex sclerosing lesions (CSLs) with epithelial atypia, Classical Lobular neoplasia (ALH/LCIS), Papillary lesions with epithelial atypia, Mixed, Flat epithelial atypia (FEA), including radiological and clinical follow-up data.
Results: 616 patients had a B3 lesion after core biopsy. 110 patients had "high risk" lesions. This included 17 (15.5%) ADH, 22 (20%) radial scars/CSLs with atypia, 47 (42.7%) LCIS/ALH, 7 (6.4%) papillary lesions with atypia, 13 (11.8%) mixed lesions & 4 (3.6%) FEA lesions. 4 of 110 (3.6%) developed invasive/in-situ disease, 4 of 110 (3.6%) developed recurrence during follow-up. 33 of 616 (5.4%) upgraded to invasive disease after excision.
Conclusion: Five years of routine radiological surveillance may not be necessary in patients who undergo surgical excision of "high-risk" B3 lesions. Clinical surveillance appears to be of little benefit, especially in patients with radial scars, papillary lesions, and FEA. Subsequent development of invasive/in-situ disease in patients who undergo surgical excision of atypical B3 lesions remains low.

Poster

An audit on the completeness of histopathological reporting of pancreatic neuroendocrine tumours (PanNENs) in St Vincent's University Hospital (SVUH) from 2009 to 2021

Dr Grace Hennessy Dr Lindsey Clarke and Prof Niall Swan

Background and Aims: Pancreatic neuroendocrine tumors (PanNEN) are a rare heterogeneous group of endocrine tumours arising in the pancreas. The European Neuroendocrine Tumour Society (ENETS) has developed a pathology data set to standardise the reporting of NEN. The criteria includes differentiation, proliferation, neuroendocrine features, stage as well as optional biomarkers. **Aim:** To examine the completeness of histopathological reporting of PanNENs.

Methods: 127 pathological reports containing PanNENs were retrieved from lab database system, over 12 years. Report completeness was assessed to the standard of the European Neuroendocrine Tumour Society (ENETS). If any 1 out of 11 core data item was missing the report was considered incomplete.

Results:

All core data items as per ENET standards were present in 46% (59/127)

Of the 68 incomplete reports, 23% excluded 1 core data and 4% excluded 6 core data

Tumour location, size (< 1 cm= 10, 1-2cm= 51, >2 cm= 66) and type recorded in 100% of cases

-6 % of reports excluded depth of tumour invasion. Tumour is confined to the pancreas in 75% of cases. 34% (23/68) of cases excluded lymph nodes number and status in the final report. These cases consisted of 17 distal pancreatectomies, 2 enucleations and 3 "pancreatic excisions".

35% excluded perineural invasion and 6% excluded lymphovascular invasion in the final report.

22% grade (57% of cases were grade 1, 33 % grade 2, 10 % grade 3).

22% excluded mitotic count, 4% excluded Ki-65 index.

80% included both synaptophysin (100% positive) and chromogranin A

54% reported SStr2 A (74.2% positive), 3 reported p53 (wild type pattern) 8 reported Insulin, 3 reported PR and 1 reported Gastrin.

Conclusion: The quality of report completeness in pancreatic PanNENs is essential to aid correct management of PanNEN tumours. There is continued vigilance required to maintain accurate recording of data and the introduction of updated report templates has improved report accuracy.