10. DOXYCYCLINE INDUCED GASTRITIS AND OESOPHAGEAL ULCER

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We report an unusual case of a 71-year-old female patient from Cairns Base Hospital who developed significant dysphagia following treatment with doxycycline for possible leptospirosis. Endoscopically, a lesion in the oesophagus thought to be 'oesophagitis desiccans superficialis' and what appeared to be a 'lichenoid lesion' in the upper stomach were seen. Microscopically, the oesophageal biopsies showed a benign ulcer. The gastric body and biopsies showed linear superficial gastric mucosal coagulative necrosis, focal cryptitis, crypt abscesses formation, associated regenerative changes together with coagulative necrosis of capillary walls. This is the second report of Doxycycline induced gastritis with concurrent oesophageal ulcer.

11. TARGETED NEXT GENERATION SEQUENCING IN FFPE SAMPLES OF NSCLC

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Background: With increasing clinical need for comprehensive molecular characterisation of non-small cell lung carcinoma (NSCLC), there is a great advantage in using targeted cancer panels and next generation sequencing (NGS) to simultaneously assess a wide range of mutations in multiple genes.

Aims and Methods: We aimed to assess the utility of the TruSeq Amplicon Cancer Panel that assesses 48 genes (35 kb target regions) using the Illumina MiSeq platform in routine formalin-fixed paraffin-embedded (FFPE) tumour samples from 31 resected lung adenocarcinomas. Results were compared to mutation analysis with the OncoCarta V.10 panel that covers hot spots in 19 genes using a mass spectrometry platform.

Results: 28 of 31 cases were suitable for NGS but 3 failed quality control. These 3 cases were all >15 years old while the rest were <15 years old. Using NGS, there were 12 (42.9%) *TP53* mutations, 11 (39.3%) *KRAS* mutations, 9 (32.1%) *EGFR* mutations and 2 (7.1%) *PIK3CA* mutations. Mutations were also found in *BRAF*, *ATM*, *PTEN*, *PDGFRA*, *ERBB4*, *MET*, *HRAS*, *STK11*, *HRAS*, *CTNNB1*, *NOTCH1* and *SMARCB1* in one case each. All the *EGFR* and *KRAS* mutations were also identified by mass spectrometry. Of the 3 cases that were unable to be assessed by NGS, mass spectrometry was performed and identified an *EGFR* mutation and a *BRAF* mutation.

Conclusion: Targeted NGS performs well in FFPE samples of NSCLC and is feasible in a routine clinical setting.

12. FATAL MENINGOENCEPHALITIS SECONDARY TO NEMATODE *HALICEPHALOBUS GINGIVALIS* INFECTION IN A HUMAN

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We present the case of a 73-year-old woman with a past history of rheumatoid arthritis for which she was being treated with etanercept and methotrexate and type 2 diabetes mellitus, who developed malaise, increasing confusion and unsteady gait over a period of four days, which rapidly progressed to coma. She was admitted to hospital and despite extensive investigation no cause for her symptoms of suspected meningoencephalitis could be identified. She died on day 9 after admission and permission was obtained for a post mortem examination. External examination of the brain showed congestion but the leptomeninges were clear. There was extensive maceration of the base of the brain and brain stem with necrosis of the temporal lobes, basal ganglia, anterior corpus callosum, right cerebral peduncle, cerebellum and sellar region. Histological examination revealed features of a meningoencephalitis characterised by a predominantly histiocytic inflammatory infiltrate within the leptomeninges and a perivascular chronic inflammation within the parenchyma. There was no granulomatous inflammation. Histology also demonstrated widespread infiltration of the brain by nematodes, which measured 250–300 × 15–20 microns, as well as eggs measuring 40–55 × 20–25 microns. The nematodes were present throughout the parenchyma but were predominantly seen within the Virchow-Robin spaces and around blood vessels. They displayed a rhabditiform oesophagus with a corpus, isthmus and bulb characteristic of *Halicephalobus gingivalis* and this was confirmed on real time PCR of the large-subunit ribosomal DNA (LSU rDNA) from brain tissue and CSF. No nematodes were identified outside the central nervous system. This organism, also referred to as *Micronema deletrix* or *Halicephalobus deletrix*, is a neurotropic nematode usually isolated from decomposing organic matter and horse manure. Meningoencephalitis secondary to *H. gingivalis* in humans is rare with only five cases reported in the literature. The natural history is of a rapidly progressive meningoencephalitis with an invariably fatal outcome. Helminth infection and specifically *H. gingivalis* needs to be considered in the differential diagnosis of a rapidly progressive meningoencephalitis of unknown aetiology, particularly in immunosuppressed individuals. This case also highlights the need for further investigation into possible diagnostic tests in the ante mortem setting.

13. CARDIAC HAEMANGIOMA: A CONTEMPORARY REVIEW OF 152 TUMOURS PUBLISHED BETWEEN 1996–2014

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Background: The literature on cardiac haemangioma (CH) is limited and based on relatively small series that predate development of modern cardiac imaging and surgery.

Methods: We undertook an electronic search to review cases published between 1996–2014 to gain a contemporary understanding of the clinical presentation, pathology, classification, treatment and outcome of CH. The English literature contains 152 cardiac haemangiomas in which 148 patients had a description of histopathology and sufficient information to be included.

Results: The age range was 0–86 years with average age of 49 year. There was an equal representation of female to male patients. The predominate CH were cavernous (39%), followed by haemangioma (not specified) (23.6%), capillary haemangiomas (16.2%) and mixed haemangiomas (16.8%). 75% of adult cases were symptomatic with dyspnoea (28%), chest pains (18%), arrhythmia (18%) and symptoms of heart failure (5.3%) as the major presenting signs. With the development of echocardiography and CT imaging techniques, 24% of patients had a cardiac mass identified incidentally. In infants, 10 of 20 cases (50%) were diagnosed by *in utero* ultrasound scan. There were 120 patients who underwent successful complete resection and 15 patients with subtotal resection. Majority of deaths were due to perioperative complications [6/148 (4%)]. Those who survived surgery had an excellent prognosis. The risk of recurrence is low <1%.

Conclusion: The recent literature on CH shows a number of significant differences from the older literature: incidence is lower, no sex predominance, majority of patients are symptomatic. Infantile CH may prove to be a separate sub-group with differences in presentation, location, histology and behavior. The rise in the number of cases reported in 2014 reflects increasing availability in echocardiography, CT and MRI imaging. The role of the pathologist in diagnosis of these lesions is evolving with the majority of recent cases diagnosed antemortem.

14. PF4-INDUCED APOPTOSIS IN BREAST CANCER *IN VIVO* STUDY: THE ROLE OF THE CASPASES FAMILY

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Background: This study focused on PF4, the anti-tumour drug agent that targets apoptosis pathways.

Aim: This study aimed to investigate PF4's effects on the apoptosis regulation mediated by caspase-3, -6, -7, -8 and -9 in 1-methyl-1-nitrosourea-induced invasive murine breast carcinoma model.

Methods: Breast carcinomas were induced in 100 21-day-old female Sprague Dawley rats using 1-methyl-1-nitrosourea until the size reached 14.5±0.5 mm. The tumors were divided into the following groups: Group 1 (control pre-treated, *n*=20 and post

treated, *n*=20), and Group 2 (PF4, *n*=20). PF4 were administered through focal intralesional injections at 20 µg/lesion dosage. After 5 days of treatment, the SDRs were sacrificed. Subsequently the tumor specimens were prepared for haematoxylin and eosin staining. The expression of Bax, Bcl-2 and caspase family members (caspase-3, -6, -7, -8 and -9) were detected using immunohistochemistry. The specimens were morphologically examined and the positive cells counts of each caspase expression were recorded.

Results: There was a significant reduction of tumor size after PF4 treatment compared to the controls. PF4 had no effect on Bax and Bcl-2. PF4 demonstrated differential effects on downstream effector caspases; both upregulated caspase-3 and -6, and downregulated caspase-7 expression was observed compared to the controls. PF4 exhibited significant effects on the three caspases (*p*<0.001, *p*=0.004 and *p*=0.024, respectively). PF4 had no effect on caspase-8 (*p*=0.225) and caspase-9 (*p*=0.062) expression.

Conclusion: This study found that PF4 acts differentially on the caspase-mediated apoptosis pathways and on the downstream levels of the apoptotic machinery. Nevertheless, PF4 plays a vital role to induce apoptosis in breast carcinoma.

15. DIAGNOSTIC VALUE OF GALECTIN-3 AND HECTOR BATTIFORA MESOTHELIAL EPITOPE (HBME)-1 AS A MARKER FOR MALIGNANCY IN THE DIAGNOSIS OF THYROID LESIONS

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Background: The differential diagnosis between malignant and benign lesions of the thyroid gland has always been in a problematic issue. Morphologic similarities of benign and malignant lesions, especially in follicular lesions, and subjectivity of morphologic criteria has led pathologists to search for more objective additional diagnostic markers.

Aim: To investigate the usefulness of immunohistochemical expression of galectin-3 and HBME-1 as markers in the differentiation between benign and malignant thyroid lesions.

Methods: We evaluated 64 thyroid lesions including 48 neoplastic lesions [16 papillary carcinomas (PC), 16 follicular carcinomas (FC), 16 follicular adenomas (FA)] and 16 non-neoplastic lesions/nodular goiter (NG) using immunohistochemical methods. The expression of Galectin-3 and HBME-1 were scored and analysed.

Results: The expression of galectin-3 was positive in 100% of PC, 62.5% of FC, 18.8% of FA and negative in NG. The expression of HBME-1 was positive in 93.8% of PC, 81.3 % of FC, 25% of FA and negative in NG. Significant differences were found between benign and malignant lesions, and also between the subgroups of benign and malignant lesions (*p*<0.001) for both galectin-3 and HBME-1. The sensitivity, specificity, positive predictive values and negative predictive values were 81.25%, 90.62%, 89.65% and 82.85%, respectively, for galectin-3 and 87.5% in each value for HBME-1; whereas the results for both markers combined were 93.75%, 81.25%, 83.33% and