Board of Education and Assessment Trainee Poster Prize

TO WHAT EXTENT CAN A COMPUTER VISION SYSTEM IDENTIFY PATHOLOGY WITH LIMITED VISUAL FIELDS?

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Deep learning based computer vision systems are used in many fields for a variety of classification and identification tasks. They are composed of a network that learns features, rather than traditional hand-curated rules. The diagnosis of human pathology is primarily based on the visual features in histology slides. These slides are prepared by sampling a small amount of the original tissue and interpretation is sometimes limited by paucity of visual material. To what extent can computer systems, which create their own visual feature map, be used to make diagnoses where visual information is limited? We present our findings in the context of renal biopsies.

EPIDEMIOLOGY OF CULTURE-POSITIVE MUCORMYCOSIS IN QUEENSLAND: 2013–2018

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Mucormycosis is an uncommon, but serious, invasive mould infection associated with rapid progression and high morbidity and mortality. Infection can occur in a broad range of hosts, including the immunocompetent. This retrospective observational study of culture-positive proven and probable cases between November 2013 and November 2018 identified a total of 48 cases (34 proven and 14 probable) out of 215 patients with positive cultures.

Rhizopus spp. were the most common aetiology (22, 45.8% of cases). Patients who sustained trauma were most likely to have non-*Rhizopus* species as were patients from outside south-East Queensland. *Saksena* spp. infection were most commonly associated with trauma, cutaneous infection and with residence in tropical regions. Haematological malignancy, diabetes and trauma were the most common risk factors. Disseminated infection was rare (4%) though extensive localised spread was common in those with both cutaneous and rhino-orbital-cerebral manifestations.

The 30-day and 1-year mortality were 17% and 33.33% respectively. The strongest predictors of mortality were rhino-orbital-cerebral site of infection (OR 11.67, $p=0.01$, CI 2.05–66.41), diabetes mellitus (OR 4.2, $p=0.04$, CI 1.06–16.58) and haematological malignancy (OR 5, $p=0.02$, CI 1.38–21.21). The strongest factor associated with survival was cutaneous site of infection (OR 0.15, $p=0.01$, CI 0.04–0.59).

DEMONSTRATION OF ECULIZUMAB DEPOSITION BY DIRECT IMMUNOFLOUORESCENCE ON A RENAL BIOPSY IN A CASE OF ATYPICAL HAEMOLYTIC URAEMIC SYNDROME

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Ecilizumab is an IgG2/IgG4 kappa monoclonal antibody that blocks C5 and subsequent terminal complement pathway activation. It can be useful in complement-mediated atypical haemolytic uraemic syndrome occurring as a consequence of complement dysregulation. We report a case demonstrating direct immunofluorescence (DIF) findings suggestive of ecilizumab binding to renal tissue.

A 40-year-old man with primary focal segmental glomerulosclerosis underwent deceased donor renal transplantation. After an unremarkable post-transplant period, he developed thrombotic microangiopathy (TMA) complicated by graft dysfunction and ischaemic ileal ulcers. Despite commencing ecilizumab for possible complement-mediated aHUS, he had progressive renal impairment and persistent haematological features of TMA, and proceeded to graft nephrectomy five days post-ecilizumab administration. On DIF, renal tissue demonstrated sparse focal lobular aggregates of IgG within glomeruli and bright IgG deposition within walls of tubules, which was kappa light-chain restricted. Serum free light chain ratio was normal, and no serum paraprotein was detected. Renal biopsies pre-ecilizumab administration did not demonstrate this binding pattern. Further examination revealed IgG2 and IgG4 subclass restriction, suggestive of ecilizumab binding to C5 in renal tissue. Similar renal biopsy staining patterns have been attributed to ecilizumab deposition.^{1,2} Pathologists should be aware that therapeutic monoclonal antibodies may be detected on biopsy specimens.

References

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