LOOKING AT DISEASE IN THE EYE

Text by Dr Timothy Tay

Working in anatomical pathology has given me the opportunity to study diseased tissue and discover the pathology behind patients' symptoms. It is a discipline where we encounter the disease face-to-face at the cellular level. Comprising histopathology and cytopathology, our work in anatomical pathology revolves around grossing of tissue specimens, microscopic examination and intraoperative examination.

Grossing involves cutting and examining large surgical specimens, followed by sampling of relevant areas for microscopic examination. These are areas that are important to the pathology report. For example, the greatest depth of invasion of a colonic carcinoma in a colectomy specimen is essential for cancer staging, and the surgical margin of a breast's wide excision for ductal carcinoma in situ is necessary to confirm completeness of excision.

Intraoperative examination of tissue, also known as the frozen section procedure, is a technique that freezes tissue using liquid nitrogen. The tissue then becomes hard enough to allow thin sectioning for examination under a microscope. It is a rapid process that allows quick examination of tissue in the intraoperative setting, but is also associated with freezing artefacts that render interpretation more challenging. Cytopathology, which is the study of abnormal cells in a variety of specimen types, including fine needle aspiration and cervical Pap smears, forms another component of anatomical pathology.

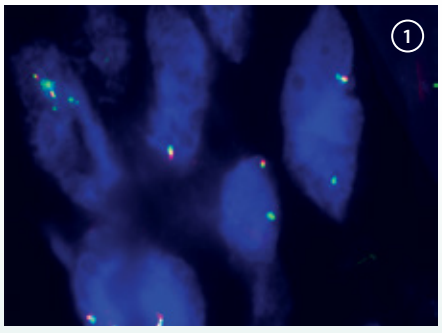

Photo: Cytogenetics Lab, Singapore General Hospital

Microscopic examination of tissue, which is the key component of our work, has undergone transformation over the past decades. In the past, histopathologists only had the haematoxylin and eosin stain, and other histochemical stains to characterise tissue. Today, our arsenal has expanded to include a large number of immunohistochemical (IHC) stains. The advent of immunohistochemistry in the 1990s revolutionised the practice of anatomical pathology. This technique localises specific antigens in cells and tissue via antigen-antibody recognition, and helps us to better define the phenotype of tumours. In addition to aiding in diagnosis, they also predict response to treatment in some instances, such as the oestrogen and progesterone receptor and HER2/neu IHC stains, which predict response to tamoxifen and trastuzumab, respectively.

Today, technology has once again ushered anatomical pathology into another new era. With molecular techniques becoming more affordable and applicable in histopathology, we are now able to analyse tumours at the genetic level, going beyond what the naked eye can see. It is indeed amazing how far anatomical pathology has come since its humble beginnings. Hopefully, with these advances, we will be able to unlock more mysteries pertaining to cancer pathogenesis and find more effective ways of treatment.

Legend

1. Molecular testing for FUS gene translocation in a low grade fibromyxoid sarcoma using fluorescent in situ hybridisation

Dr Timothy Tay is currently an associate consultant in the Department of Anatomical Pathology, Singapore General Hospital. He counts it a privilege to be in the company of more experienced and senior colleagues, and enjoys going to work every day.