Consultant Sabbatical Fellowship Report for BAD, 2020

Professor Rino Cerio

Molecular Pathology, Infection & Immunity

Department of Core Pathology-Dermatopathology Division

Queen Mary's University of London Medical School

London, UK

Curiously, there has been a positive acceleration in the use of emerging technology to help us cope during the SARS CoV-2 pandemic crisis. For sure we have had to adapt rapidly. Its implementation has required a steep learning curve especially given its swift adoption into routine medical practice at all levels. Telemedicine has been fast forwarded and no truer than for both teledermatology and telepathology. As such, our healthcare systems now have greater incentives to compile and exchange information. Current regulations, however, lack standards to assess the safety and efficacy of technology systems. Another hurdle is data exchange which need to be trained (continuously) by data from clinical studies.

In our global medical environment cost effective education and practice is evolving with faster networks, and ever-growing digital memory allowing cheaper data storage. The use of robotic devices that process multiple glass histology slides holding and using conventional microscopes and electronic digital scanning is common e.g. MDTs.

Such innovation has developed whole slide imaging (WSI) systems also termed "i-Slides" is increasingly employed in educational, but also in professional medical settings, highlighting the value of virtual digital microscopy. There is an increased availability of i-Slides and acceptance among pathologists who favour their use in primary diagnostic dermatopathology. Nevertheless, there has been a reluctance to introduce diagnostic applications due to a lack of validation and regulation of these devices.

The generous sabbatical grant provided by the BAD has allowed me, over the last year, to be a Visiting Expert at NUS/NUHS and NSC twice pre-lockdown and reinforce professional links to implement a prospective comparison international study. With senior and junior collaborators colleagues the potential accuracy in evaluating distant e-learning for postgraduate specialist training in dermatopathology for both dermatology and pathology residents/SpRs in two major centres, i.e. London and Singapore, will be assessed. The study also aims to provide information regarding the performance of WSI and to validate it for use in the virtual diagnosis of cutaneous diseases, using the interobserver variability as the primary form of analysis.

National Skin Centre

NSS hospitality

CPC Postgrad MDT at NUHS-trainees, seniors and international visitors

Post Grad Training e-Learning Educational Study - Part 1

Comparing SpRs/residents' abilities in diagnosing dermatopathology disorders in two image formats (traditional microscopic slides and digitised WSI-iSlide) and to assess their perceptions of virtual iSlide microscopy in dermatopathology. Twelve trainees from London and Singapore in dermatology(n=6) and pathology(n=6) training programs at both institutions will be given a randomized combination of 30 virtual WSI and glass slides and will be asked to identify the diagnoses from multiple sections. Their impressions about the virtual images and descriptive data analysis and comparison of groups using Pearson chi and Fisher exact tests for categorical variables and Student t test for continuous variables will be performed.

Expert Dermatopathology Comparison Study - Part 2

Seventy-five H&E-stained glass slides of sequential skin biopsies including, reactive, infective, genetic dermatoses as well as benign and malignant non-melanocytic and melanocytic skin tumours will be scanned using the NanoZoomer Digital Pathology System by Hamamatsu at magnifications of ×10, x20 and x64. Four experienced dermatopathologists (2 each from London and Singapore) will blindly analyse all H&E- glass slides and, after two-week washout,

with WSI. Clinical information will be provided along with the cases in both analyses. The interobserver agreement (k value) WSI will be assessed for all four dermatopathologists. Preferred diagnoses will be recorded as well as discordances in different cases for each of the 4 dermatopathologists. These include challenging cases. Median time taken to make a diagnosis will also be measured. This study will provide evidence of any advantages or disadvantages when adopting WSI for everyday diagnostic purposes in clinical practice, routine pathology and primary diagnosis in the field of dermatopathology.
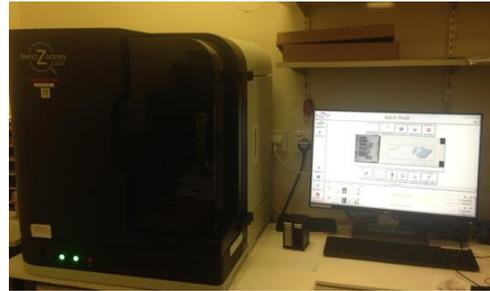
UK and Singapore scanner using the NanoZoomer Digital Pathology System by Hamamatsu

Modern pathology education and daily practice is moving toward a centralised digital workflow, expanding available technology to view scanned histology slides. The method of digitization of glass slides, in combination with the development of specialized software to identify and measure events previously observed via a microscope, has enhanced the ability for pathologists to take advantage of digital image analysis. As such, this result in the generation of tissue-derived readouts that are precise and highly reproducible iSlides. Despite the catastrophe of Covid, now, as never before, have the inflicted changes in health care, paved the way to extend the value of digital dermatopathology far beyond what is possible today and quantified above. Indeed, this technology holds great promise.

Welcome to the future of diagnostic cutaneous medicine and the "iSlide".

Thank you BAD from a grateful old member!

Venturing outside at the harbourfront in February 2020 as expected!!

Consultant Dermatopathologists at NUS/NUHS – Justin Wong (back), Bing Tan and Soo Tan Yoo (Boss!!) (Front)

Past SARS experience implemented rapidly with Covid-19