VENTANA®

Case study: whole slide image telepathology enables more efficient slide evaluation

How University Hospital Basel improved its pathology workflow efficiency

The University Hospital Basel is one of the leading medical centres in Switzerland and has a high, internationally recognised standard for treatment and medical innovation.

University Hospital Basel is comprised of 50 clinics, units and institutes all working together in an interdisciplinary manner to provide a central, interprofessional approach to diagnostics and treatment.

"Telepathology with uPath enterprise software improved the time needed to reach a definitive diagnosis and the availability of expert knowledge"

Dr. Daniel Baumhoer
Consultant Pathologist and Head of the Bone Tumor Reference Centre, University Hospital Basel

Whole slide image telepathology enables more efficient slide evaluation[1]

Problem

The hospital needed better workflow solutions to improve the efficiency of their remote intraoperative diagnosis of frozen sections. Without a remote solution, pathologists would need to travel 40 km to review cases onsite at partner Hôpital du Jura in Delémont, Switzerland, adding to the time required for expert collaboration and definitive diagnosis. Their solution was to use a robotic microscope to review cases remotely. However, there were inefficiencies with the robotic microscope. The hospital chose to evaluate the VENTANA® DP 200 slide scanner* and uPath enterprise software* to improve the efficiency of the workflow.

Solution

Roche uPath enterprise software and the VENTANA DP 200 slide scanner were selected to improve whole slide image (WSI) acquisition and workflow efficiency for histopathologic teleconsultation. To test and validate the use of WSI in comparison with robotic microscopy for intraoperative frozen section consultation of peripheral hospitals serviced by the department, the VENTANA DP 200 slide scanner was compared to an established remote-controlled conventional microscope (robotic microscope).

Results

Roche uPath enterprise workflow software reduced the amount of time it took to diagnose each case by an average of 8 minutes. Total handling time from the availability of the slide to the pathologist transmission of the diagnosis to the surgeon was 11 minutes with Roche digital pathology, compared to 19 minutes with robotic microscopy. Diagnoses made using whole slide images scanned on the VENTANA DP 200 and viewed on the uPath enterprise software were identical to the final diagnosis made after paraffin embedment and robotic microscopy.

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Materials and methods

- 30 intraoperative frozen section consultation cases retrospectively analysed.
- Slides were scanned using a VENTANA DP 200 slide scanner and analysed using uPath enterprise software.
- All cases were viewed independently by two pathologists using both WSI and glass slides.

Findings

Time to diagnosis

Digital pathology significantly reduced the time for the pathologist to reach a diagnosis.

Median slide evaluation time:

| 2 minutes | WSI |
| 16 minutes | Robotic Microscopy |

Slide handling time

Digital pathology reduced total handling time from the slide being ready for scanning to the pathologist transmitting the diagnosis to the surgeon.

Median handling time:

| 11 minutes | WSI |
| 19 minutes | Robotic Microscopy |

Image quality and resolution

Image quality and resolution were significantly improved using WSI.

Median value:

| 1 (range 1-3) | WSI |
| 3 (range 2-4) | Robotic Microscopy |

The scoring ranged from 'very good/the same as a slide under a conventional microscope' (1) to 'not suitable for diagnostics' (6)

Bonus: High WSI image quality allowed detection of a positive resection margin of a malignant melanoma that had been missed using remote-controlled microscopy.

Results[1]

WSI-based telepathology proves to be an efficient and reliable tool providing faster turn-around time and excellent image resolution.

Learn more about Roche Digital Pathology at go.roche.com/dpsolution

[1] Intraoperative frozen section consultation by remote whole-slide imaging analysis – validation and comparison to robotic remote microscopy. Menter T, Nicolet S, Baumhoer D, et al. J Clin Pathol 2020;73:350–352.