Editorial

How to implement virtual microscopy in routine tissue – based diagnosis: Guidelines and Recommendations of the Federal Association of German Pathologists

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Abstract Digital Pathology has jumped over the first barriers and enters the world of routine tissue – based diagnosis (surgical pathology) slowly and continuously. Several large pathology institutions use virtual slides (VS) for routine diagnosis, store the images in digital archives, and digitize their workflow according to the needs of laboratory (LIS) and hospital information system (HIS).

Development and implementation of communication standards as well as adequate certification and quality control units are mandatory if an adequate and secure diagnosis and treatment of patients should be maintained or amended.

The publication of the translated guidelines of the Federal Association of German Pathologists should give our readers the opportunity to read the well designed and substantial document in its original version. We include a few representative virtual slides in our editorial in order to demonstrate the actual performance of virtual microscopy.

Thus, we offer our readers to comparing some issues of the virtual world with their own situation and to get informed about the essential procedures of accurate virtual microscopy implementation.

Keywords: Guidelines, virtual microscopy, routine diagnosis, virtual slide, Professional Association of German Pathologists.
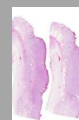
Virtual Slides:

TMA non small cell lung cancer   Liver biopsy LALD   Dermtofibrosarcoma protuberans
(Lysosomal Acid Lipase Deficiency

Why guidelines?

Progress in medicine is characterized by two main factors. These include

  a. Increase of specification in diagnostics and treatment
  b. Followed by increase of communication and cooperation.

The factor specification is of physical nature and includes recently developed micro-biology techniques such as DNA sequencing, microbiomics, gene transfers, or infra-red laser technology.

The factor communication is of 'electronic' or virtual nature. It includes the transfer of 'real data' into a (digitized) virtual environment, the combination of the different scenarios with each other, and to calculate the diagnosis, i.e. the advice of the optimum clinical treatment. The calculation should be reproducible and applicable for 'retransformation' of the combined data into the real environment, i.e., to treat the patient in the best way.

The different involved compartments have to 'understand' each other. Adequate standards and their regulation have to be developed and implemented in order to assure an errorless and secure function. The operation of the standard is regulated by guide lines. The standards under consideration concern medical protocols (HL7), images (DICOM), archive (PACS), and others.

Their employment is essential for virtual microscopy and its accurate function in a laboratory and hospital environment.

Why virtual microscopy?

The application of 'electronic tools' in diagnostic surgical pathology started with electronic components (telepathology) in the 1980, at a time, when CCD cameras have been developed. It matured to digital pathology in the next 3o years and includes already integrated 'diagnosis assistants' at present.

Our understanding of the specific characteristics of the virtual world' becomes more sophisticated and allows the implementation and use of appropriate digitalization and communication tools [1-5]. This to our understanding an irreversible process and offers several opportunities if correctly applied. The attached virtual slides invite the reader to get an idea of viewing and deriving a diagnosis from a virtual slide <figures 1, 2, 3>.

The application and implementation of appropriate digital diagnosis assistance tools require the implementation and performance of virtual microscopy.

It´s correct and scientifically founded implementation as well as the compliance with data security regulations is described well and in detail in the herein published guidelines of the Federal Association of German Pathologists.

References

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Figure 1 TMA non small cell lung cancer (click to show WSI)

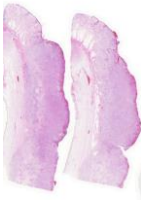Figure 2 Liver biopsy LALD (Lysosomal Acid Lipase Deficiency) (click to show WSI)

Figure 3 Dermtofibrosarcoma protuberans (click to show WSI)