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Editorial

Digital pathology & whole slide imaging: A viewpoint

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Abstract

Dear researchers and readers in Pathology,
Diagnostic pathology branches are developing immensely now a days with great speed. Digital pathology, telepathology, whole slide imaging (WSI) and artificial intelligence are becoming main options for routine diagnosis in the western world and well accepted now. In this editorial, I will discuss a view point of these in the Indian scenario.

Keywords: Digital pathology, Artificial intelligence, Telepathology, Whole slide imaging

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Histopathology is the branch of pathology where we learn and study of abnormal things on the thin tissue sections on glass slides by histotechnique procedures. These pictures of slides were captured as static images using microscope dedicated optical cameras or on mobile phones in recent era are called as digital pathology (DP).[1] With the introduction of whole slide imaging (WSI), the entire glass slide of tissue is transformed into high resolution virtual slides. Both digital pathology and WSI has history of 2 decades since 1999.[1,2]

Digital pathology has totally changed the reporting of histopathology in the western world from glass slides to the digitalized images on computer screen and changed the storage media from glass slides cabinets to cloud or software or digital library files[2].Digital pathology with WSI and AI based approach leads to high resolution, increased scanning capacity, faster speed in the detection, segmentation and diagnosis in histopathology.[2] In the recent times, USFDA approved the digital pathology for primary diagnosis of in the United states of America, European countries and Japan.[2,3] Due to DP and WSI, telepathology and telediagnosis in the remote areas are very useful and used frequently after COVID -19 era. [2,3]

But in such developments we are still lagging behind Radiology fellows as its doesn't decreases our burden and workload as we have to prepare the glass slides for DP and WSI (dual investment), whereas such things are not needed in radiology due to AI. Technical requirements of WSI are digital scanner of excellent quality. Many venders are available in India also with best cost. But the hurdles are of cost ranging from thousands to many lakhs.[3]

Advantages of digital pathology and WSI[3]

1. Rapid and quick access with lower turnaround time as no physical slides transfer.
2. Telepathology and telediagnosis in the remote areas with social distancing (as in Covid pandemics).
3. No breakage of glass slides,no fading or any erroes in slides, no lost of slides as stored as digital images in sotware or cloud etc.
4. Easy workload distribution,good occupational health, less signout time and computational pathology development.
5. Efficient,faster and accurate measurements and exact calculation of tumor content like mitotic figure counts, ki67 index and various scores like Gleason etc in pathology with the help of molecular techniques and AI.
6. Useful for remote teaching, in conferences and in exams as students friendly.

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Limitations and disadvantages of DP and WSI

1. Adapatability and compatibility as we are more microscope friendly since many years.
2. Cost is very much high and not cost effective in small setup.
3. Decresed interpersonal communication.
4. Misuse or overuse of second opinion.
5. Tissue blocks are not available for ancillary techniques later on,storage of both slides and images that is dual work.
6. Technical expert, Integration of laboratory integration software and much more IT dependance with regular training compared to routine microscopy.
7. Interpreataive errors as computer vision symdrome and limited scope in cytopathology.

Conclusion

To conclude, Digital pathology and WSI has great potential and revolutionary step for routine histopathology diagnosis in near future.If used properly, DP has capasity to improve convenience and quality in pathology diagnosis with great precision, accuracy with proper management of data.DP and WSI has not free of limitations if we remove these limitations,they will be the future of diagnostic histopathology

Happy reading , Thank you all

Regards,

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