Cancer care: ensuring that digitalization benefits rare cancer patients

Telepathology and telemedicine: what has changed during Covid-19 for rare cancer patients?

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Digital pathology before the pandemic

Current use, research > routine

High efficiency, high costs

Money is the barrier
A new workflow

Digital pathology

Dynamic, image-based environment enabling acquisition, management and interpretation of pathology information generated from a digitized glass slide

Whole-Slide Imaging (WSI)

Single, high magnification digital image of an entire microscopic slide

WSI technology allows glass slides to be scanned and viewed on a computer screen via dedicated software

Information generated from the digitized glass slide, beyond the traditional microscope paradigm
Digital pathology, pros and cons

- Digitalized archive
- Virtual repository
- Integrated within the electronic clinical record
- Records for genomic analysis (tumor area, cellularity)
- Virtual intra-dept second opinion
- Patient documentation

- Slides preparation
- Trained and committed personnel
- Overall personnel attitude
- Costs
Telepathology for rare tumors

- Quick sharing of digital slides
- It uses telecommunications technology to facilitate the transfer of slide pathology data to distant locations for the purposes of research, education and diagnosis
- Digital slides are inherently easier to share than physical slides.
- Telepathology could be used for a wide spectrum of clinical applications:
  - Second opinion diagnosis
  - Education
  - Research
Second opinion in rare cancers: from the backs of patients…
...to the digital pathology network
Rare (in common tumors as well) biomarkers

Wang, Nat Med, 2021

Thai, Lancet, 2021
INT institutional molecular tumor board: first patient discussed April, 29th, 2020
Networking is the solution for rare tumors and biomarkers

<table>
<thead>
<tr>
<th>87 patients</th>
<th>NTRK IHC/NGS</th>
<th>NGS + (fusion detected)</th>
<th>NGS – (WT/no fusion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IHC + (25)</td>
<td>10 (40%)</td>
<td>15 (60%)</td>
<td></td>
</tr>
<tr>
<td>IHC – (62)</td>
<td>1 (2%)</td>
<td>61 (98%)</td>
<td></td>
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IHC cut-off 1%
Overall concordance rate: 81.6%
NPV 98.3% (MSKCC 383 cases 2020 97%)
PPV 40% (MSKCC 49%)
Digital pathology after pandemic

Improve diagnosis
Reduce TAT
Rationalize resources
Network
Education
Treatment
Prognosis