VM in Reference Pathology and External Clinical Services

The new Telepathology Concept?

H.P. Sinn

Sektion Gynäkopathologie
Pathologisches Institut der Universität Heidelberg
Disclaimer

Virtual slide usage has been supported by the Medical Faculty, University of Heidelberg

I have no financial or consultative relationship with any commercial entity, nor have I had any in the past.
QA (quality assurance) for breast pathology

- Standardized procedures for work-up, assessment, and documentation (European Guidelines)
- Educational programmes in breast pathology
  - Tutorials in breast pathology, such as offered by the IAP
  - Special courses in pathology of core biopsies
- Quality circles
- Internet based efforts
- Accreditation of the responsible pathologist
- Double reading
4 possible ways for double reading in pathology

- Send away the tissue slides
  - Traditional method of pathologic consulting

- Telepathology
  - Possible, but time consuming and other problems

- Virtual microscopy
  - The future?

- On-site review of pathology slides
  - Not established in Germany
Advantages and disadvantages of sending slides (and/or tissue blocks)

**Advantages**
- Same conditions for primary and reference pathologist
- Reference pathologist can perform special stains
- Highest possible quality of getting a second opinion in pathology

**Disadvantages**
- Time delay 1 - 3 days, usually, sometimes longer
- Pathologists cannot interact, little educational value
- Requires a lot of logistic and secretarial effort on both sides
- Slides can get lost

Currently the preferred method
Telepathology Solutions

- **Static Telepathology**
  - Transmission of electronic images (www, ftp, e-mail)
  - Disadvantage: Image(s) may not be representative

- **Dynamic Telepathology**
  - „Live“ Microscopy of slides, remote control of microscope
  - Disadvantage: Slow, expensive, often malfunction

- **Semi-static Telepathology**

- **Virtual Microscopy**
Classical Telepathology

(South Scotland Telepathology Network)
Damn it, Spock, I am a doctor, not a computer programmer
Remote viewing of histology slides simultaneous with projection of slides at the conference

- Live telephone connection
- About 2 frames / minute
- Case discussion
Equipment and procedure

- **Wiesbaden**
  - Mikroscope (Nikon Eclipse)
  - 1 Megapixel Camera (Nikon)
  - DSL (512 kb/s upload)
  - Telephone

- **Heidelberg**
  - Transmission of case details per FAX from the center
  - Viewing with Internet Explorer
  - Transmission of reports per FAX to the center
In case of disagreement

- Discussion and arbitrage
- Ordering special studies (immunohistochemistry)
- Sending the slides
Disadvantages of classical telepathology

- Only few images at low and at high resolution can be transmitted per case
- Remote pathologist is depends on local pathologist for sending representative fields of view
- Limitations in image resolution and speed of transmission
Experience with telepathology

- Routinely used during mammography screening pilot project phase
- Few technical problems relating to
  - Server configuration
  - Network problems
- Very few cases that required sending of the slides (less than 1 case per month)
Additional advantages of telepathology simultaneous with case conference

- Reasoning and discussion among pathologists becomes transparent for all participants
- Histology images can be stored remotely in an image database for
  - education
  - scientific reevaluation
  - case comparisons
Telepathology Volumes at Pittsburgh

http://www.plco.ca/publications/dr_michael_becich_aug25.ppt
Virtual microscopy for teleconsultation

- Web-based look at microscopy slides, anytime, anywhere
- Quality similar to conventional microscopy
- Immediate access of archived images
- Technology mature
Virtual microscopy for frozen sections

- Clinical Problem: Sentinel node biopsy in remote hospital (Bruchsal)
- Prerequisite: Laboratory with histotechnician and cryostat
- Sampling of the tissue by surgeon (gynaecologist)
- Time needed for cutting of frozen section and scanning: approx. 10 min
- Additionally: Imprint cytology
- In clinical use since 1 year
Virtual microscopy for frozen sections

Possible problems

- Scanning speed: adequate for normal samples, but not for multiple or very large sections
- Network: Outside hospital should have good upload speed
- Quality of tissue sections
- Evaluation more time consuming than under the microscope
Results

- 75 Lymph node biopsies examined
- 8 Metastases detected
- False negatives: 1
- False positives: 0

Safe and reliable procedure
Teleconsultation and Quality Circles

Internationale Akademie für Pathologie
Deutsche Abteilung e.V.

45. Symposium 2009

Einladung und Programm
27. Februar - 01. März 2009 in Bonn
Online-Hotelreservierung unter:
www.tcbonn.de/con/html/3341-259.html

Anmeldung (pdf-Datei, 37 kB)
Programm (pdf-Datei, 1353 kB)

Freitag, 27. Februar 2009
08:30 Uhr - 13:00 Uhr

Halbtags-Seminar:
Lymphome und ausgewählte Differentialdiagnosen

Anamnese als .pdf
Diagnoseliste als .pdf
Diagnoseliste als .doc

Prof. Dr. med. M.-L. Hansmann, D- Frankfurt
Prof. Dr. med. Ch. Fellbaum, D- Singen

Schwangerschaftsbezogene Trophoblasterkrankungen

Anamnese als .pdf
Diagnoseliste als .pdf
Diagnoseliste als .doc
Conclusions

- **VM for frozen section diagnosis:**
  - Useful, if no macroscopic evaluation by pathologist necessary
  - Waiting time (scanning speed) mostly acceptable
  - More time consuming overall

- **VM for teleconsultation**
  - Advantages:
    - Asynchronous technique
    - Much better imaging compared to classical telepathology
  - Disadvantage: Subjectively “different” than compared with classical microscopy
‟I skate to where the puck is going to be, not where it has been.‟

Wayne Gretzky