Use of Telepathology in Oncology

Telepathology network in Ile de France:
a 18-month pilot program for intraoperative consultation (telediagnosis) and second opinion diagnosis (teleexpertise)

Telepathology Working Group
Catherine GUETTIER
Head of Pathology – Bicêtre University Hospital (Paris)
• Telemedicine:
The delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interests of advancing the health of individuals and their communities” (WHO).

• Telepathology:
*Telepathology* is the area of telemedicine involving the transmission of pathological specimen images for remote study and diagnosis of disease.

• Digital slides
Digital slides 1/2

- To numerize the whole tissue section of the glass slide = many pictures of high quality
  **Whole Slide Image** 500 Mb - 3Gb

- High throughput scanners

- Software: stitching, streaming and navigation = virtual microscope

- CE marking for in vitro diagnosis/FDA
Validation of digital pathology imaging for primary histopathological diagnosis

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Context: Situation of Pathology in France

- Shortage and aging of pathologists
- Reorganization of Pathology structures with shared technical facilities
- Increased number and complexity of cases
- Molecular pathology
- Systematic reviewing of lymphomas and « rare cancers » required by the National Institute of Cancer (INCa)
Telepathology network in Ile de France 1/2
18 month pilot program (June 2014 - December 2015)

Regional Health Agency of Ile de France
Call for Telemedicine projects 2012
Telepathology 550 000€
### Telediagnosis for frozen sections

- **CHU P. Brousse**
  - Scanner provided through the project
- **CHG Meaux**
  - Scanner provided through the project
- **La Croix St Simon**
  - Scanner provided through the project
- **CHU Bicêtre**
- **CHG Marnes La Vallée**
- **CHU Saint Antoine**

### Second opinion Teleconsultation

<table>
<thead>
<tr>
<th>Already equipped with a scanner</th>
<th>Scanners provided through the project</th>
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<tbody>
<tr>
<td>CHU Bichat</td>
<td>CHG Pontoise</td>
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<td>CHU Cochin</td>
<td>CHG Eaubonne</td>
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<td>CHU HEGP</td>
<td>CHG Villeneuve St George</td>
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<td>CHU Pitié Salp.</td>
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<td>ACP Bièvres</td>
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<td>CHU A. Paré</td>
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<td>CHU Trousseau</td>
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<td>CHU K. Bicêtre</td>
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<td>CHU H. Mondor</td>
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Regional Telepathology platform

TRIBVN HEALTHCARE

TELESLIDE

Health data storage

GCS-SESAN
Intraoperative teleconsultations 1/2

Hospital 1
Operating room: Request for intra-operative consultation
- File’s registration
- Videomacroscopy
- Sampling
- Cutting/Staining
- Slide numerization x20

Internet/Intranet
Telepathology Platform
- Telepathology file
- Webex launch
- Webconference
or Local server

Hospital 2
Pathology laboratory
- Assistance for sampling
- Microscopic diagnosis

Turnaround time < 30 min
Intraoperative teleconsultations 2/2

Pilot network (3 pairs) June 2014-December 2015: 637 completed IOTC/42 technical failures

Paul Brousse/Bicêtre Intraoperative consultations for oncological surgery

<table>
<thead>
<tr>
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<th>Before telepathology December 2012-May 2013</th>
<th>After telepathology July 2013-December 2015</th>
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<tbody>
<tr>
<td>Number</td>
<td>76</td>
<td>498</td>
</tr>
<tr>
<td>Technical incidents</td>
<td>0</td>
<td>59</td>
</tr>
<tr>
<td>Mean turnaround time</td>
<td>0:26:12</td>
<td>0:38:00 (p&lt;0.001)</td>
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<tr>
<td>% of turnaround time &lt;30mn</td>
<td>71.1%</td>
<td>38.6%</td>
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<tr>
<td>Diagnostic concordance</td>
<td>94.7%</td>
<td>94.0% (NS)</td>
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*Astrid Laurent-Bellue
Second opinion Teleconsultation
Second opinion Teleconsultation 1/3

Hospital 1
Operating room:
Request for intra-operative consultation

Consult requestor
Scanners

- Slide numerization x40
- Telepathology case
  (JPG, pdf, virtual slides, clinical information)
- Choice of an expert pathologist
- Upload on the PF

Regional Telepathology Platform

Internet – 4G Modem

Hospital 2
Pathology laboratory

Consultant
Viewer

- Views the TP Case
- Accepts or not
- Asks for supplementary material
- Gives second opinion diagnosis

Dedicated network
Second opinion Teleconsultation 2/3
Second opinion Teleconsultation 3/3

67 users of the platform
- 56 as consult requestor/consultant
- 11 as consult requestor only

256 requests for second opinion diagnosis
- 214 completed
- Oncologic pathology 75%

Mean response time:
7 days/ 25 days for conventional second opinion consultation

17% of cases with request for supplementary material (slides or paraffin blocks) by the expert pathologist

- 12 requests answered by informal messages through the PF
- 5 closed requests because of refusal from the selected expert
- 19 closed requests because of no response from the expert
Near Future

Intraoperative Teleconsultation

Second opinion Teleconsultation

1
Subscription to the Regional Platform of Telemedicine (ORTIF) based on needs (ex Teleneuro, Telederm, OPDIAH, Telepathology ...)

2
Fees for services with a lower and an upper limit-fixed price

Point to point intra- or inter health structures
Intranet/VPN

Regional Healthcare Numerical space

- Intraoperative Teleconsultation
- Second opinion Teleconsultation
- Point to point intra- or inter health structures
- Intranet/VPN
- Regional Healthcare Numerical space
Conclusion

- Feasability
- A real challenge for technologists and pathologists
- High speed dedicated network (ROSeS)
- Regional Telepathology Platform integrated into ORTIF
- InterRegion Network extension
- First step to Digital Pathology
# Telepathology Working Group Ile de France

<table>
<thead>
<tr>
<th>NAME</th>
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<th>FUNCTION</th>
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<tbody>
<tr>
<td>Philippe Bertheau</td>
<td>St-Louis</td>
<td>Pathologist</td>
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<td>Frédéric Beuvon</td>
<td>Cochin</td>
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<td>Frédérique Capron</td>
<td>La Pitié</td>
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<td>Agnès Chabouis</td>
<td>DOMU</td>
<td>Telemedicine</td>
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<td>Joël Cucherousset</td>
<td>Montfermeil</td>
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<td>CSS SI Patient</td>
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