**Papillary lesions Diagnosis and Management**

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**Papillomas a real challenge**

1. Diagnostician faces complex entity (‘papillary lesions’)
   - Benign papillomas: papillary lesion is found in up to 90% of the breast tissue.
   - Atypical papillomas: papillary lesion is found in up to 90% of the breast tissue.
   - Intraductal papillomas: papillary lesion is found in up to 90% of the breast tissue.

2. Challenge for pathologist:
   - Pathological overlap between benign and malignant papillary lesions.
   - Limited sampling may miss the malignant part.

**Significance of biopsy method**

- Fine needle aspiration cytology (FNA) vs. core needle biopsy (CNB)

**Frequency of papillary lesions**

- Earlier literature:
  - Overall VAB in papillary carcinoma: up to 5%
  - All VAB in Switzerland (2006 – beginning of 2015): 4.86%
  - All VAB Breast center Zürich: 4.54%

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**Significance of biopsy method**

- Fine needle aspiration cytology vs. core needle biopsy

**Frequency of papillary lesion in terms of all lesions undergoing breast biopsies**

- Earlier literature:
  - All VAB Breast center Zürich: 144 papillomas / 3170 VAB

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- Fine needle aspiration cytology vs. core needle biopsy

**Results**

- Accuracy of 58%.
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**Significance of biopsy method**

**Problem:**
- Mixing of different needle sizes
- Not equal meaning

**Conclusion:**
- 14G core needle biopsy insufficient to rule out malignancy
- Lesion has to be removed

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**Significance of biopsy method**

Focus on 14G Core Needle biopsy

**Table 1:** Upgrade Rates after Surgical Excision of Biopsy Samples

- 6 papillary lesions with atypia: no upgrade
- 5 papillary lesions without atypia: no upgrade
- 7 papillary lesions with atypia: 2DCIS (18%)

**Conclusion:** 14G Core needle biopsy insufficient to rule out malignancy

**Significance of biopsy method**

Problem:
- Most studies based on a mixture of different biopsy methods
  - US guided
  - Mx

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### Authors conclusion

- **Wyss; The Breast Journal 2014**
- **Yamaguchi R; Histopathology 2015**

#### Results:

- **5 lesions/ 14: malignant**
- **1 lesion (< 5mm): DCIS G1 + microinvasion**
- **2 lesions: size < 28 mm**
- **1 lesion (15mm): invasive CA G1**
- **1 lesion (10mm): invasive CA G1**

#### My personal conclusion:

- Lesion size or primary imaging has to respected follow-up of benign papillary lesions (VAB), with a size largely > 1.5 cm dangerous

#### Authors conclusion:

**11G VAB** is benign papillary lesions. Is not 100% accurate, but it may not require immediate excision as long as 5 if follow-up is carried out. Excision should be performed in cases with changes in size/shape at interval imaging.

### Decision for follow-up instead of surgery in case of benign papillary lesions

<table>
<thead>
<tr>
<th>Lesion size (primary imaging)</th>
<th>&lt; 1.5 cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAB needle size at least 11 G</td>
<td></td>
</tr>
<tr>
<td>No underlying atypia at VAB</td>
<td></td>
</tr>
<tr>
<td>Follow-up of at least 5 years guaranteed</td>
<td></td>
</tr>
</tbody>
</table>

### Decision to undergo VAB or surgery

1. Is this the only lesion (or probably further ones)?
2. Is it a small lesion (< 1.5 cm)?
3. Are there any additional B2 findings (e.g., association with atypia, nodular size, ALH, LCIS)?
4. Are there any additional suspicious imaging findings (in the same or a different imaging modality)?
5. Is there an additional pathological nipple discharge?
**Decision to undergo VAB or surgery**

**Appearance of small papillary lesions**

**Imaging features for benign papillary lesions**
- Several calciﬁcations (except VAB: papillary)
- Several growing mass lesion (US core biopsy: papillary)
- Open surgery: distinction Result: papillary (without atypia)

**Biopsies at different locations (papillary)**
- Segmentectomy (papillary without atypia)

**Different situation: larger extent**
- Not possible to completely remove them by VAB
- Certain risk of underestimation

**Decision to undergo VAB or surgery**

1. Is this the only lesion (or probably further ones)?
2. Is it a small lesion (< 1.5 cm)?
3. Are there any additional B3 findings (e.g., association with atypia/ radial scar/ ALH/ LCIS)?
4. Are there any additional suspicious imaging ﬁndings in the same or a different imaging modality?
5. Is there an additional pathologic nipple discharge?

**Biopsy result and risk**

<table>
<thead>
<tr>
<th>Lesion</th>
<th>relative risk of breast cancer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single papilloma</td>
<td>X 2.04</td>
</tr>
<tr>
<td>Multiple papillomas</td>
<td>X 3.01</td>
</tr>
<tr>
<td>Atypia without papilla</td>
<td>X 4.17</td>
</tr>
<tr>
<td>Single Papilloma with atypia (ADH/ ALH)</td>
<td>X 5.11</td>
</tr>
<tr>
<td>Multiple papillomas with atypia</td>
<td>X 7.01</td>
</tr>
</tbody>
</table>

- Problem with multiple papillomas: risk of undersampling (papillomas not completely removed) = generally higher risk of malignancy
- If associated with any additional B3 lesion: the risk even increases ↑
Further decision making dependant on diverse aspects

Nature of Papillary lesions: very small, round, circumscribed, frequently without calcifications; simultaneous occurrence at different locations possible

1. Is this the only lesion (or probably further ones)?
2. Is it a small lesion (< 1.5 cm)
3. Are there any additional B3 findings (e.g. association with atypia/ radial scar/ ALH/ LCIS)
4. Are there any additional suspicious imaging findings (in the same or a different imaging modality)
5. Is there an additional pathologic nipple discharge?

US: dense, smooth mass, no additional suspicious finding US lesion overlaps the border of the cyst
Mx: dense, smooth mass, no additional suspicious finding US lesion overlaps the border of the cyst

Microcalcifications only left side
Segmentations Papilloma with DCIS G2 (R6) + Radiotherapy

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Decision to undergo VAB or surgery in case of benign papilloma lesions

Further decision making dependent on diverse aspects
- Diagnostic imaging features + coincidence with other findings

Nature of Papillary lesions: very small, residual, frequently without calcifications; simultaneous occurrence at different locations possible

1. Is this the only lesion (or probably further ones)?
2. Is it a small lesion (< 1.5 cm)
3. Are there any additional ER3 findings (e.g. association with nipple/retromamillar ALH/LCIS)
4. Are there any additional suspicious imaging findings (in the same or a different imaging modality)
5. Is there an additional pathologic nipple discharge?

Decision to undergo VAB or surgery

Pathologic Nipple dischage

Detection of MRI, mammography, sonography may detect an abnormality

- Occurrence of papillary lesions

Incidental findings (especially at sonographic examination)
- Pathologic Nipple Discharge
- Targeted search for papillary lesions

• spontaneous, unilateral, persistent
• all kinds of non-milky secretion: clear, watery, serous, brown, bloody
- associated with increased cancer risk

Study aim: Detection of High Risk Lesion or malignancy (standardized only detection of malignancy)

<table>
<thead>
<tr>
<th>Detection of MRI, mammography, sonography</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>PPV</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>mammography, ER Radial 2011</td>
<td>26%</td>
<td>95%</td>
<td>63%</td>
<td>84%</td>
</tr>
<tr>
<td>MRI, Am J Surgery 2010</td>
<td>79%</td>
<td>84%</td>
<td>29%</td>
<td>79%</td>
</tr>
<tr>
<td>Kurtz, C. 2014</td>
<td>57%</td>
<td>100%</td>
<td>33%</td>
<td>77%</td>
</tr>
</tbody>
</table>

MRI: most sensitive examination for the detection of papillary lesions or malignancy

MRI

T2 SPARR

US prior to MRI: normal

Case 1: Pathologic nipple discharge left; primary Mx + US normal

US after MRI: Ductectasia with vascularized lesion

US: CADB papillary lesion

MRI: VAB - benign papilloma

Decision to undergo VAB or surgery

Pathologic ND

Suspicious lesion

Retromamillar + Clustered, ring, NME 4-5 is still positive

Highly suspicious

important to biopsy

Segmentectomy + still papillary type

VAB: DCE+ in both lesion: 

quadrantectomy

Different situation: pathologic nipple discharge

- Ductal (branching) NME -> highly suspicious papillary type at VAB: upgrade to DCE+ very likely

- Segmentectomy: still papillary type

- US prior to MRI: normal

US after MRI: Ductectasia with vascularized lesion

US: CADB papillary lesion

US: VAB - follow-up no more visible
Pathologic Nipple discharge

High negative predictive value to exclude a papillary lesion and malignancy

<table>
<thead>
<tr>
<th>Neoplasms with or without malignity</th>
<th>Lesions detected by US or US + ...</th>
<th>Lesions detected by US or US + ...</th>
<th>Malignancy detected by US or US + ...</th>
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<tr>
<td>Malignant</td>
<td>18%</td>
<td>62%</td>
<td>84%</td>
<td>84%</td>
</tr>
<tr>
<td>Korsch; 2014</td>
<td>50%</td>
<td>50%</td>
<td>81%</td>
<td>96%</td>
</tr>
</tbody>
</table>

Conclusion

In case of confirmed papillary lesion + no suspicious finding at MRI => radiologic follow-up can be considered as sufficient safe

Management of papillomas (without nipple discharge)

Finding suspicious of papilloma (e.g. US)

- CNB: to exclude atypia
- If papillary (without atypia) and ≤ 1.5 cm:
  - Excision
- If papillary and atypia:
  - Excision + additional suspicious imaging findings (e.g. US, MRI)

Suspicious finding:
- Surveillance

If additional B3 lesion:
- Nipple excision
- Surgical excision

With the information given by MRI:
- The papillary lesion is easier detectable
- Enables sonographic CNB
- If papillary lesion: sonographic VAB (therapy)

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Suspicious finding:
- Surveillance

If additional B3 lesion:
- Nipple excision
- Surgical excision
- If papillary lesion: sonographic VAB (therapy)
Management of papillomas

With nipple discharge:

Finding suspicious of papilloma (e.g. US/MRI)

- CNB to exclude atypia

If papillary (without atypia) and ≤ 1.5 cm:

- Sonogram: VAB (less invasive)

If papillary and atypia:

- Surgical excision
  - Platelet-poor plasma
  - VAB

If papillary with added B3 lesion:

- e.g. papillary + ADH → surgery
- e.g. papillary + LCIS → discussion
- e.g. papillary + RS → discussion

Suspicious finding:

- Biopsy

Management identical:

Some papillary lesions may initially be located by MRI

Conclusions:

Small papillary lesions can easily be removed by a less invasive VAB

Open surgeries should only be performed in cases of:

- Larger papillary lesions
- or other criteria (e.g. suspicious imaging or association with atypia)

Conclusion:

In times of overtherapy and the discussion which findings are to undergo surgery, papillary lesions represent in the whole scale of risk the lowest risk

Some papillary lesions might initially be biopsied by MRI

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