Papillary lesions
Diagnosis and Management

C. Kurtz, Department of Radiology
Cantonal Hospital Luzern

IBUS - Zürich - January 2016
Frequency of papillary lesions in terms of all lesions undergoing breast biopsies

**Earlier literature:**

- Liberman L; *AJR* 1999;
- Reynolds HE. *AJR* 2000;
- Mercado CL.; *Radiology* 2001;
- Philpotts LE, *Radiology* 2000
- Jackman RJ; *Radiology* 1999;

⇒ up to 5%

- MIBB – database
  (all VAB in Switzerland 2008 – beginning of 2015)

1.135 papillary lesions/ 23,367 VAB
⇒ 4.86%

- All VAB Breast center Zürich

144 papillary lesions/ 3170 VAB
⇒ 4.54%
Papillary lesions a major challenge

1. Diagnostician faces complex entity („papillary lesions“)
   - Radiologic Imaging: Morphological overlap between benign + malignant papillary lesions
   - Benign biopsy results (benign papillomas): related with high upgrade rates to malignancy (if surgery)

2. Challenge for pathologist:
   - heterogeneous group of epithelial lesions: intraductal papilloma → atypical PL → papillary carcinoma
   - intraloesional heterogeneity: benign and malignant areas simultaneously occurring (benign PL can be associated with small foci of ADH or DCIS within PL or the surrounding tissue)
   - uncertain biological potential: benign papillomas can develop into a papillary carcinoma

**intraductal papilloma (benign)**
- central papilloma (solitary, often discharge)
- peripheral papillomas (multiple; usually clinically occult; higher association with UDH, ADH, DCIS and invasive cancer)

**atypical papilloma** (focal atypical epithelial proliferation with low grade cores; might be consistent with ADH or small foci of DCIS)

**intraductal papillary carcinoma** (cores of DCIS; at least 90% of the papillary process without myoepihel)
- special form: intracystic papillary carcinoma
Significance of biopsy method

- Core Needle Biopsy (CNB)
- Vacuumbiopsy (VAB)

**CNB: tru cut needle**
Automated biopsy gun without vacuum
- mainly 14 G (12G to 17G)
- 2–5 specimen (small sample)

**Vacuumbiopsy (VAB):**
Applied vacuum
- 12 G and larger
- 12 specimen on average (small lesions can be removed)

---

**Table 1**
Comparative core sample sizes of large core needle biopsy and vacuum-assisted mammoctomy (VAM)

<table>
<thead>
<tr>
<th>Core sample size</th>
<th>14 G core</th>
<th>14 G VAM</th>
<th>11 G VAM</th>
<th>7 G VAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core sample size</td>
<td>17 mg</td>
<td>35 mg</td>
<td>100 mg</td>
<td>250 mg</td>
</tr>
</tbody>
</table>
**Problem:**
- Mixture of different needle sizes
- Different meaning

**Problem:**
- Mixture of different guidance methods
  - Mx: the papillary lesion is not directly visualized (indirectly)
  - US: the complete lesion is directly visualized

**RESULTS:**

Of the 130 papillary lesions, 6 were sampled with an 11-G vacuum-assisted needle under stereotactic guidance and the remaining 124 were sampled under US guidance with a 14-G (n = 115), 18-G (n = 8), or 10-G (n = 1) needle. Initial core needle biopsy diagnosis was benign (n = 103), showed atypia (n = 20), or malignancy (n = 7).
Significance of biopsy method

Problem:

- Mixture of various biopsy methods
  - sonographic + stereotactic biopsy together
  - large variance of needle size (8-20 Gauge !!!)

Upgrade Rates: less representative

Conclusion: Surgery is necessary
Significance of biopsy method

Focus on 14 G Core needle biopsy
- only US guided (main guidance method); 3-5 biopsy samples

- **Chang; AJR 2011** (all with surgery; (54 with 14 G CNB, 10 with 11G VAB)
  - 64 benign papillomas without atypia
  - upgrade rate (surgery) → 7/64 atypia (11%)
  - → 2/64 DCIS (3%)

- **Bianchi; Pathol Oncol Res 2015** (all with surgery (all with 14G CNB)
  - 68 papillary lesions without atypia: upgrade rate (surgery) → 9/68 cancer (13%)
  - 46 papillary lesions with atypia: upgrade rate (surgery) → 22/46 cancer (48%)
  - (7 DCIS and 15 invasive cancer)

- **Kim; Clin Radiol 2011** (Exzision or follow-up ≥ 2J; all atypia were excised (all with 14G CNB)
  - 157 papillary lesions without atypia: upgrade rate (surgery) → 4/157 atypia (2%)
  - → 12/157 cancer (8%)
  - 15 papillary lesions with atypia: upgrade rate (surgery) → 5/15 cancer (33%)

- **Youk; AJR 2010** (all with surgery (all with 14G CNB)
  - 30 papillary lesions with atypia: upgrade rate (surgery) → 7/30 cancer (23%)

**Conclusion:** 14G Core needle biopsy insufficient to rule out malignancy
→ lesion has to be removed
Are we better with Large Core Vacuumbiopsy?

Kim; Clin Radiol 2011

Exzision or follow-up ≥ 2J (24 – 48 months; median 2,6 years) (8G or 11G US-guided VAB)

54 papillary lesions without atypia → no upgrade to carcinoma (0%); 5 with surgery + 49 with follow-up

7 papillary lesions with atypia → no upgrade to carcinoma (0%); 5 with surgery + 2 with follow-up

Far better results than with CNB (14 G)

But:

→ Only a few PL underwent surgery (as control group)

→ median follow-up only 2,6 years

DCIS at the site of biopsy could still be possible

to find out if Large-Core VAB is safe enough

→ essential to perform either surgery (confirmation) or long-term follow-up studies
Are we better with Large Core Vacuumbiopsy?

Chang; Ann Surg Oncol 2011  
60 papillary lesions with 11G US-guided VAB → all surgery

11 Atypical papilloma at VAB
Upgrade to
↓
2 DCIS (18%)

49 benign papilloma at VAB (without atypia)
Upgrade to
↓
9 Atypia (18%)
No upgrade to malignancy

Conclusion

papillary lesions with atypia at VAB:
complete surgical excision necessary

benign papillary lesions at VAB:
«certain risk»: of missing atypia if surgery is rejected ♦ candidates for closer monitoring
Follow-up after VAB of benign PL

Mosier AD: Breast J 2013

86 benign papillomas without atypia (11G or 8G VAB; guidance Mx/ US/ MRI)

→ all follow-up (no surgical excision)

2 – 8.8 years of follow-up
(average: 4 y 10 months)

Result:
Nothing suspicious on imaging during follow-up → No upgrade

Conclusion:
Eligible papillary lesions for follow-up instead of surgical excision have to cover several criteria:

- < 1.5 cm in initial imaging (mass on mammogram or ultrasound)
- Biopsied by 11G or larger size (smaller Gauge)
- Benign biopsy result without atypia
Follow-up after VAB of benign PL

**Wyss: The Breast Journal 2014**

**VAB: 7G/10G/11G (Mx/US)**

Only lesions in direct neighborhood of 2-3 cm of the initial papilloma were considered.

- Mean follow-up 3.2 years (0.5 – 10.2 years)

**Conclusion:**

VAB is an accurate method for diagnosis and treatment of papillary lesion.

- If no other **suspicous radiologic** or **clinical findings** (after removal of papilloma) → **VAB is safe**

67 benign PL at primary VAB → all with follow-up

- 67 VAB (36 stereo, 31 US-guided)
- 3 OB: 1 papilloma
  - 2 benign
- 64 no further therapy

Follow-up with suspicious imaging findings + upgrade:

- 1 DCIS at surgery
- 1 FEA

71 benign PL at therapeutic VAB

(after CNB of benign papilloma) → all with follow-up

- 78 VAB
  - 51 papillomas
  - 19 benign
  - 3 radial scars
  - 1 ADH
  - 1 ADH, LN, FEA
  - 3 DCIS
  - 3 OB: 2 DCIS
- 1 radial scar

Follow-up with suspicious imaging findings + upgrade:

- 1 DCIS at surgery
- 2 High Risk lesions (ADH/ radial scar)

About 120 of 138 patients (~87%) could be spared from surgery.
Follow-up after VAB of benign PL

Yamaguchi R; Histopathology 2015

125 benign papillary lesions 11G VAB

→ mainly follow-up (3 excised directly after biopsy);
→ 14 excised due to changes in size/shape at follow-up

Results:

4 / 14 excised lesions: malignant

2 lesions: size ≥ 20 mm
1 lesion < 5mm
1 lesion (15mm)

But:

too large to be safely removed by VAB

Upgrade rate: 4/125 PL = 3.2%

Comment:

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

Authors conclusion:

11G VAB in benign papillary lesions is not 100% accurate, but it may not require immediate excision as long as at least 5 y follow-up is carried out

Excision should be performed in cases with changes in size/shape at intevall imaging
Retrospective evaluation of all VAB in Switzerland (2008-2015)

MIBB database (11 G VAB or larger)

837 benign papillary lesions without atypia

683 only follow-up
(no follow-up data)

154 open surgery
(no information about lesion size)

96 benign papillary
37 benign
2 ADH
2 LN

12 malignancies
8 DCIS
4 invasive cancer

Regarding only lesions with open surgery → Upgrade rate: 12/154 = 7.7%
Reason: larger lesions underwent VAB → real representative area was not sampled
Retrospective evaluation of all VAB in Switzerland (2008-2015)

**MIBB database** (11 G VAB or larger)

- 19 PL + Atypia + open surgery
  - 1 Upgrade to DCIS
  - Upgrade rate: 5.26% (1/19)

- 24 PL + ADH + no other lesion/ or ≥1 B3 lesion
  - 1 Upgrade to DCIS
  - Upgrade rate: 4.16% (1/24)

Chang; Ann Surg Oncol 2011
Upgrade rate of atypical papilloma 18%

Nevertheless: PL with atypia should generally be removed by open surgery
Decision for **Follow-up instead of surgery** in case of benign papillary lesions is possible

- Lesions size (primary imaging) < 1.5 cm
- VAB Needle size at least 11 G (or larger)
- No underlying atypia at VAB
- Follow-up of at least 5 years guaranteed

**Further aspects**

1. **Is this the only lesion**
2. **Is it a small lesion** (< 1.5 cm)
3. **Are there any additional proven 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**?
Imaging features of benign papillary lesions

Solitary mass lesion
- round/oval shape
- smooth margin
- transparent rim „Halo“ possible

Mammography:

Solitary small lesion $\rightarrow$ VAB

Decision to undergo VAB or surgery

1. Is this the only lesion (or probably further ones)?
Decision to undergo VAB or surgery

Mammography:

**Imaging features of benign papillary lesions**

- Several calcifications (stereot. VAB: papillary)
- Several growing mass lesions (US core biopsy: papillary)

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

1. Is this the only lesion (or probably further ones)?
**Biopsy result and risk** (prior to surgery)

*Lewis; Am J Surg Path 2006*

<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 papilloma</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 atypia: **the risk even increases** 🕵️‍♂️
Typical features of papillary lesions:

- intraductal hyperechoic lesion within a dilated duct
- solid lesion within a cyst
- Color doppler: vascular pedicle (vascularization)

But: In terms of sonographic imaging features → mostly not possible to differentiate between benign ↔ malignant papillary lesions
Decision to perform **VAB or surgery** in case of a benign papillary lesion

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**?
Patient: no complaints;

**US** - single isoechoic lesion within duct
  - single vessel to the center

**US 14G-CNB:**
→ papillary lesion without atypia

**MX:** if there might be calcifications

Decision to perform **VAB or surgery**

2. Is it a small lesion ($\leq 1.5$ cm)?

- small lesion → **US-VAB (therapeutical):**
  → papillary lesion without atypia
  → at 1 year follow-up: completely removed
Decision to perform **VAB or surgery** in case of a benign papillary lesion

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** ?
Lob 14G CNB (external):

- Atypical papillary proliferations

Mx: dense, smooth mass
no additional suspicious finding

US: lesion excises the border of the cyst

- strong, radial vascularisation
- a lot of central vessels

Due to Atypia + papillary: open surgery inevitable

→ Segmentectomy:

Papilloma with DCIS G2 (R0)
Decision to perform **VAB or surgery** in case of a benign papillary lesion

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**?
Mx: assymetric, dense, smooth mass
US: large cystic lesion
- hyperechoic structure inside cyst
- irregular vascularized lesion ventral part
(images from external institution)

US 14G- CNB (external):
→ Cyst (B2)

Calcifications only left side

Decision to perform VAB or surgery

4. Are there any additional suspicious imaging findings?
Decision to undergo VAB or surgery

4. Are there any additional suspicious imaging findings?

Message:
If you have an additional suspicious finding together with a papillary lesion or something that looks like a papillary lesion, don’t forget to investigate the concomitant finding! !!!!

Surgical excision of cyst (external):
→ Invasive CA + papillary DCIS G3 (R1 at all margins)

4 cm cystic lesion left side

Calcifications only left side

Stereot. VAB (fine-pleomorphic calcifications)
inner + outer quadrants:
→ again DCIS G3 → mastectomy
Decision to perform **VAB or surgery** in case of a benign papillary lesion

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**?
Occurrence of papillary lesions

Pathologic Nipple Discharge

- targeted search for papillary lesions

Three major causes of ND:

- Papillomas (frequency 35-70%)
- Duct ectasia (frequency 17-36%)
- Carcinoma (frequency 5-21%)

Definition:

- spontaneous, unilateral, persistent, non-milky secretion:
  clear, watery, serous, brown, bloody
  associated with increased cancer risk
**Pathologic Nipple discharge (ND)**

*Only a few studies* aimed at detecting a papillary lesions (High Risk Lesion) or malignancy

<table>
<thead>
<tr>
<th>Detection of HRL or malignancy</th>
<th>Mx Sens</th>
<th>Spez</th>
<th>Sono Sens</th>
<th>Spez</th>
<th>Cytology Sens</th>
<th>Spez</th>
<th>Galakto Sens</th>
<th>Spez</th>
<th>MRI Sens</th>
<th>Spez</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lorenzon; Eur Radiol 2011</td>
<td>26%</td>
<td>95%</td>
<td>63%</td>
<td>84%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>95%</td>
<td>79%</td>
</tr>
<tr>
<td>Morrogh; Am J Surgery 2010</td>
<td>18%</td>
<td>94%</td>
<td>73%</td>
<td>29%</td>
<td>73%</td>
<td>59%</td>
<td>79%</td>
<td>12%</td>
<td>70%</td>
<td>44%</td>
</tr>
<tr>
<td>Kurtz; 2014</td>
<td>7%</td>
<td>100%</td>
<td>33%</td>
<td>100%</td>
<td>52%</td>
<td>50%</td>
<td>85%</td>
<td>67%</td>
<td>97%</td>
<td>67%</td>
</tr>
</tbody>
</table>

Sensitivitätssteigerung

MRI: *most sensitive examination* for the detection of papillary lesions or malignancy
Decision to perform **VAB** or surgery

5. Is there an additional pathologic nipple discharge?

**MRI**

- T2 SPAIR
- T1 Subtraction early post contrast phase
- T1 Subtraction late post contrast phase

**Patient with pathologic nipple discharge**

- Milk duct striking on T1 or T2 sequence
  - striking enhancing lesion within or adjacent to the duct

- One single lesion + nothing else → **VAB**
  - (if visible on US → US- VAB possible otherwise MR-VAB)

**US- VAB:**
- benign papilloma
- completely removed after 1 y
Decision to perform **VAB or surgery**

5. Is there an additional **pathologic nipple discharge**?

**Different situation: pathologic nipple discharge**

2nd- US: normal

Proceeding....
Decision to perform **VAB or surgery**

5. Is there an additional **pathologic nipple discharge**?

T1FS nativ

T1FS post CM

MR-VAB: DCIS G3

Post CM

MR-VAB: DCIS G3

Segmentectomie: DCIS G3 (R0)
### MRI

#### Comparison of enhancement type

<table>
<thead>
<tr>
<th>Enhancement Type at MRI</th>
<th>Papillary (n=24)</th>
<th>DCIS (n=4)</th>
<th>DCIS with microinvasion (n=1)</th>
<th>Invasive carcinoma (n=1)</th>
<th>NUD (n=9)</th>
<th>P value ( b )</th>
<th>P value ( c )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any suspicious enhancement</td>
<td>23</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0.778</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mass</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Focus</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Nonmass (NMLE)</td>
<td>16</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0.169</td>
<td>0.270</td>
</tr>
<tr>
<td><strong>NMLE-Distribution:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>focal</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>linear</td>
<td>11</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>regional</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>segmental</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>NMLE-Internal Enhancement:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>homogeneous</td>
<td>7</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>heterogeneous</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>periductal</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>reticular</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>clumped</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>clustered-ring</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- No sig. enhancement differences between papillary and malignant lesions
- Only the proximity of a lesion to a striking milk duct helped to detect the lesion
- For final differentiation biopsy necessary
Detection of papillary HRL or malignancy

<table>
<thead>
<tr>
<th>Detection of papillary HRL or malignancy</th>
<th>Galakto PPV</th>
<th>Galakto NPV</th>
<th>MRI PPV</th>
<th>MRI NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morrogh; Ann Surg Oncology 2007</td>
<td>19%</td>
<td>63%</td>
<td>56%</td>
<td>87%</td>
</tr>
<tr>
<td>Kurtz; 2014</td>
<td>92%</td>
<td>50%</td>
<td>91%</td>
<td>86%</td>
</tr>
</tbody>
</table>

MRI: High negative predictive value to exclude a papillary lesion and malignancy

Very high negative predictive value to exclude malignancy

Detection of Malignancy

<table>
<thead>
<tr>
<th>Detection of Malignancy</th>
<th>MRI NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linda; AJR 2012</td>
<td>97%</td>
</tr>
</tbody>
</table>

Papillary lesions detected by Mx or US + underwent biopsy (CNB od. VAB) afterwards MRI → Surgery

**Conclusion:**

in case of confirmed papillary lesion + no suspicious finding at MRI → radiologic follow-up can be considered as sufficient safe
path. Nipple discharge + MRI + 2nd look Sono

2nd Look US great importance

Problem of primary US:

- Not targeted, since location of the secreting duct is unknown

MRI -> information about:

- Location of the secreting duct (= guide rail)
- Location of an enhancing lesion in relation to the secreting duct (o’clock position/ subcutaneous/ close to the chestwall)
- Morphology of the lesion

With the information given by MRI, the secreting lesion is easier detectable at 2nd look US (own collective 1/3)

- Enables Sonografic CNB
- If papillary lesion small: sonograf. VAB (therapy)
Management of papillomas

Finding suspicious of papilloma (e.g. US)

CNB (less invasive):

If papillary (without atypia) and \( \leq 1.5 \) cm:
- sonograf. VAB
- if still no upgrade: Follow-up

If papillary > 1.5 cm:
- surgical excision preferable (risk of underestimation)

If papillary and atypia:
- Surgical Excision

If papillary + additional Suspicious Imaging Findings (e.g. Retraction Mx, e.g. Suspicious calcifications):
- Discussion

Suspicious finding:
- Biopsy

If no High Risk Lesion (B3) and no B4/5 lesion:
- VAB or Surgery

If additional B3 lesion:
- e.g. papillary + ADH \( \rightarrow \) surgery
- e.g. papillary + LCIS \( \rightarrow \) discussion
- e.g. papillary + RS \( \rightarrow \) discussion
Management of papillomas

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

VAB:

- If papillary (without atypia) and ≤ 1.5 cm:
  - If completely removed:
    - Surgical excision preferable (risk of underestimation)
    - Follow-up

- If papillary > 1.5 cm:
  - Surgical Excision

- If papillary and atypia:
  - Surgical Excision

- If papillary + additional Suspicious Imaging Findings:
  - e.g. Retraction Mx
  - e.g. Suspicious calcifications

- Suspicious finding:
  - Biopsy

- If no High Risk Lesion (B3) and no B4/5 lesion:
  - VAB or Surgery

- If additional B3 lesion:
  - e.g. papillary + ADH → surgery
  - e.g. papillary + LCIS → discussion
  - e.g. papillary + RS → discussion

C. Kurtz  Radiologie  -  Luzerner Kantonsspital
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.

**Conclusion:**

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)
Thank you for your attention