Benign papilloma: is US-guided vacuum-assisted breast biopsy an alternative to surgical biopsy?

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Intraductal papilloma is a benign breast tumor that develops in lactiferous ducts. Solitary papillomas usually are more central or periareolar in location whereas multiple papillomas are more peripheral in location. All 13 cases included in this study were solitary.

Because papillomas can sometimes be associated with other lesions (1, 2), complete excision of papillomas diagnosed on FNA is recommended (3-5).

The purpose of this study is to determine the value of newer techniques of US-guided vacuum-assisted excision compared to traditional surgical biopsy (6-9).

Materials and methods

Patients

Between November 2000 and April 2005, 13 cases of US-guided FNA biopsy proven intraductal papillomas were diagnosed. After review by the multidisciplinary breast committee, excision using US-guided vacuum-assisted macrobiopsy was proposed to the patients.
In this study, a retrospective review of clinical, imaging and histological data for all 13 cases is performed. Patients were aged 45 to 76 years (mean age: 54 years). Lesions were detected as follows: mammography (5 cases), US (4 cases), and clinical exam (palpable nodule in 3 cases and nodule with nipple discharge in 1 case).

**US and Mammography**

All lesions corresponded to well-depicted hypoechoic nodules on US (fig. 1), less than 20 mm in diameter. Lesions were detected on only 53% of corresponding mammograms.

**Microbiopsy**

All patients had previously undergone FNA microbiopsy (16G or 18G needles). Histology was consistent with isolated benign intraductal papilloma in all cases (fig. 2). Excision of the lesion was then proposed to the patients, either surgical or percutaneous using US-guided vacuum-assisted macrobiopsy.

**US-guided vacuum-assisted macrobiopsy**

Patients were placed in the supine position during US-guided vacuum-assisted macrobiopsy. The nodule was localized using a Toshiba Power 6000 US unit equipped with a 15 MHz linear transducer. Local anesthesia with a mixture of lidocaine and epinephrine was performed to decrease local bleeding. Anesthesia was performed in 2 steps: the superficial portion of the lesion was injected first followed by the deeper portion of the nodule to separate it from the deeper tissues. A 3 mm skin incision was performed using a scalpel to allow placement of the 8G or 11G macrobiopsy needle (Mammotome H.H.® Breastcare) (fig. 3). Excisional biopsy was then performed under direct visual control to ensure complete resection of the nodule. The entire procedure was about 20 minutes long.

**Histology**

The biopsy specimens were immediately fixed in a formol solution. Each core of tissue was 3 or 4.3 mm in diameter according to the size of the needle (11G and 8G respectively). The pathologist then reviewed all specimens, comparing to prior FNA results, in order to confirm a final diagnosis.

**Patient follow-up**

Follow-up clinical and sonographic evaluation was performed at 15 days, 6 months and then yearly.

**Results**

All results are summarized in table I.
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US

All papillomas corresponded to hypoechoic nodules on US with mean diameter of 9.3 mm (minimum: 5 mm; maximum: 16 mm).

Macrobiopsies

Five biopsies were performed an 11G needle (38% of cases) while 8 biopsies were performed using an 8G needle (62% of cases). The mean number of core samples was 8.5 (minimum: 4; maximum: 12).

Benign intraductal papilloma was confirmed at final histological diagnosis in all cases, consistent with previous FNA results (fig. 4).

However, FNA diagnosis underestimated lesions in 2 cases; case n°4 was associated with a small focus of LCIS, and case n°7 was associated with extensive lesions of LCIS and atypical ductal hyperplasia.

Outcome

Excision was considered complete in all 13 cases.

Ten patients showed no local recurrence after a maximum follow-up of 57 months (median follow-up: 33 months). Two patients (cases n°1 and n°3) presented local recurrence of hypoechoic nodules on US at 28 and 22 months respectively, measuring 8 and 10 mm. FNA was consistent with isolated benign papilloma in both cases and both patients underwent repeat US-guided vacuum-assisted macrobiopsy. Final diagnosis confirmed isolated intraductal papilloma in both cases, and patients remained recurrence free at 25 and 35 months.

A single patient (case n°7) was referred for complementary surgical tumorectomy because of co-existing lesions of atypical ductal hyperplasia (11, 12). Benign intraductal papilloma was confirmed at final histological diagnosis in all cases, consistent with previous FNA results (fig. 4). However, FNA diagnosis underestimated lesions in 2 cases; case n°4 was associated with a small focus of LCIS, and case n°7 was associated with extensive lesions of LCIS and atypical ductal hyperplasia.

Discussion

Intraductal papilloma is a benign tumor of the breast that can be benign, atypical or co-exist with neoplastic lesions such as atypical ductal hyperplasia (ADH) or DCIS (11, 12). The latter may be confined to the papilloma (atypical papilloma) or at the periphery of the papilloma (ADH and DCIS) (12). Such co-existing lesions are rare but require complete excision of the lesion for histological analysis (3-5). Histology of macrobiopsy specimens showed co-existing borderline lesions at the periphery of the papilloma in 2 cases. Evaluation of the breast tissue next to the papillomas was possible due to the sufficient size of the samples from macrobiopsy. Newer techniques of US-guided vacuum-assisted macrobiopsy have already shown their efficacy for histological diagnosis of small breasts and a papilloma located in an inner quadrant.

The three other patients (cases n°6, n°8 and n°13) had a residual hematoma detected on US at 3, 6 and 1 month post procedure respectively, without associated clinical symptoms or esthetic deformity.

Table I

<table>
<thead>
<tr>
<th>CASE</th>
<th>SIZE US (mm)</th>
<th>NEEDLE (Gauge)</th>
<th>Number of cores</th>
<th>HISTOLOGY</th>
<th>EXCISION</th>
<th>FOLLOW-UP</th>
<th>COMPLICATION</th>
</tr>
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<tbody>
<tr>
<td>1</td>
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<td>11</td>
<td>12</td>
<td>papilloma</td>
<td>complete</td>
<td>recurrence at 28 months repeat procedure without recurrence at 25 months</td>
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<tr>
<td>2</td>
<td>6</td>
<td>11</td>
<td>10</td>
<td>papilloma</td>
<td>complete</td>
<td>no recurrence at 30 months</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>9</td>
<td>11</td>
<td>12</td>
<td>papilloma</td>
<td>complete</td>
<td>recurrence at 22 months repeat procedure without recurrence at 35 months</td>
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</tr>
<tr>
<td>4</td>
<td>10</td>
<td>11</td>
<td>9</td>
<td>papilloma</td>
<td>complete</td>
<td>no recurrence at 24 months</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>11</td>
<td>11</td>
<td>papilloma + micro focus of LCIS</td>
<td>complete</td>
<td>no recurrence at 36 months</td>
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<tr>
<td>6</td>
<td>16</td>
<td>8</td>
<td>12</td>
<td>papilloma</td>
<td>complete</td>
<td>no recurrence at 36 months residual hematoma at 3 months</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>12</td>
<td>8</td>
<td>7</td>
<td>papilloma + LCIS + ADH</td>
<td>complete</td>
<td>complementary surgery — tumorectomy</td>
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<tr>
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<td>6</td>
<td>8</td>
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<td>complete</td>
<td>no recurrence at 36 months</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>8</td>
<td>6</td>
<td>papilloma</td>
<td>complete</td>
<td>no recurrence at 36 months residual hematoma at 6 months hemotorax — surgical drainage</td>
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<tr>
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<td>8</td>
<td>10</td>
<td>papilloma</td>
<td>complete</td>
<td>no recurrence at 36 months</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>5</td>
<td>8</td>
<td>4</td>
<td>papilloma</td>
<td>complete</td>
<td>no recurrence at 26 months</td>
<td></td>
</tr>
<tr>
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<td>no recurrence at 25 months</td>
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<tr>
<td>13</td>
<td>11</td>
<td>8</td>
<td>9</td>
<td>papilloma</td>
<td>complete</td>
<td>no recurrence at 24 months</td>
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heterogeneous lesions, including papillary lesions, due to the larger size of biopsy specimens (6-8, 13, 14). Some authors have already published on the use of US-guided vacuum-assisted macrobiopsy for removal of isolated papillomas with nipple discharge (15, 16).

The smaller size of the lesions appears to be required (15) for successful US-guided vacuum-assisted macrobiopsy. In our population, lesions were 16 mm or less in diameter. Our results show successful complete lesion excision with absence of local papilloma recurrence in 77% of cases. Two patients (cases #1 and #3; 15%) presented with local recurrence of papilloma after the excision had been considered complete by US. This could indicate growth of a second papilloma as opposed to local recurrence following incomplete excision. However, evaluation of the degree of excision on US is less reliable than the evaluation of completeness of lesion excision on histology. Also, US-guided vacuum-assisted macrobiopsy should be performed by experienced sonographers with appropriate training with the technique (8). In addition, evaluation of resection margins is difficult on core samples from macrobiopsy because of lesion fragmentation. This underscores the need for adequate clinical, US and mammographic follow-up. Of note, recurrence of papilloma following surgical excision has also been described (17).

The procedure lasted about 20 minutes and was well tolerated by patients. Complications were infrequent and usually benign (residual hematoma) (8). Our single patient with hemotherax occurred early on in a setting of difficult biopsy and represents our only major complication in a series now of over 200 US-guided vacuum-assisted macrobiopsy procedures. Finally, we believe that it is mandatory to have a multi-disciplinary panel comprised of radiologist, surgeon and pathologist review all indications for macrobiopsy.

Conclusion
US-guided vacuum-assisted macrobiopsy is a valuable technique for the diagnosis of breast lesions. This technique may be an interesting alternative to surgery for excision of small presumed benign lesions such as intraductal papilloma. However, additional evaluation is needed to assess its true long term efficacy and further define its indications.

References