

Therapeutic mammotome excisions: papillary lesions

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Abstract

Papillary lesions of the breast are fairly common on imaging-guided breast biopsy, and the management remains controversial. Due to the heterogeneity of histological findings, papilloma can be a challenge to the pathologist when interpreting core biopsy specimens, so some may desire the entire lesion to be removed to be confident of the diagnosis of a benign papilloma. In appropriate cases, an attempt at removal with vacuum-assisted biopsy appears a reasonable approach with the hopes of establishing a diagnosis, relieving symptoms of nipple discharge, and avoiding the cost and morbidity of surgical intervention. The management of lesions with atypia on mammotome excision will remain controversial and the prudent approach is to recommend complete surgical excision.

Keywords: Breast; Biopsy; Papillary lesions

Papillary lesions

Papillary lesions of the breast comprise a group of lesions ranging from benign papillomas, to lesions containing varying levels of cellular atypia, to in situ and invasive papillary carcinomas. While benign papillary lesions account for a substantial portion of benign biopsies, papillary carcinomas account for only a small proportion of malignant diagnoses (<2%). Papillomas can occur as solitary lesions, commonly found in the central ducts, and are often discovered due to symptoms of nipple discharge. These lesions are believed to have a small malignant potential. Peripheral papillomas, occurring in the terminal ductal lobular units, can be multiple, and are thought to have a greater association with malignancy [1–4].

Histologically, the diagnosis of a benign papillary lesion is made by identifying a fibrovascular stalk and two intact layers of cells, an epithelial and myoepithelial layer. Intraductal and intracystic

papillary carcinomas are diagnosed by a lack of a continuous layer of myoepithelial cells as well as nuclear atypia. Since these are contained lesions, without disruption of the basement membrane, they are considered 'in situ' carcinomas. Invasive papillary carcinoma is diagnosed when malignant cells have invaded the stromal tissues [1–2].

Within the spectrum from benign papillomas to papillary carcinoma lays papillomas with atypia. Atypical cells can be found both within papillomas and in adjacent tissues, as areas of atypical ductal hyperplasia. Atypia can be found in only part of a papilloma. The heterogeneity of histological findings is one of the reasons papilloma can be a challenge to the pathologist when interpreting core biopsy specimens [5]. Some may desire the entire lesion to be removed to be confident of the diagnosis of a benign papilloma.

The need for surgical excision of papillomas after a core biopsy is an area of continued controversy [4–8]. Reports in the radiological and pathological literature have yielded varying recommendations as to management of papillomas. It is clear that malignant papillary carcinomas require surgical therapy. It is generally agreed that it is prudent to excise papillary lesions with atypia, as the cancer upgrade rate for these lesions has been reported as high as 75% [5,9–12].

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There is, however, more controversy surrounding benign papillomas. Many agree that benign papillomas are accurately diagnosed by core biopsy and do not require surgical excision whereas others believe the entire lesion should be removed [9–14]. Upgrade rates for 'benign' papillary lesions range from 0% to 25%. Owing to the heterogeneity of papillary lesions, some pathologists may recommend excision of all papillomas, to exclude atypia or malignancy in portions of the lesion not sampled. The risk of subsequent malignant degeneration of a papilloma is another consideration. The chance of malignant degeneration in a benign papilloma is not well understood. The time frame or natural history of such an occurrence is an area where more research is needed.

The radiological features of papillary lesions include occult findings, calcifications, masses, and masses with calcifications [12,15–19]. Gendler *et al.* attempted to determine the association with cancer for papillary lesions sampled by core biopsy and found no significant differences [12]. They also found no differences in lesion location, central vs. peripheral, but did find a higher risk with multiple vs. solitary papillary lesions.

The accuracy of percutaneous sampling relates to sampling error which is directly related to the amount of the lesion removed and thus percutaneous biopsies with larger needles will likely provide a more accurate diagnosis and less underestimation. For antidiuretic hormone (ADH) this has proved to be true, with decreasing underestimation rates noted from 14 g automated needles down to 8 g vacuum-assisted biopsies. However, even with the largest needles, the underestimation rate with ADH has not been shown to reach a level that precludes surgical biopsy (i.e. <2%) [20].

If papillary lesions are sampled with a vacuum device, could surgery be avoided for benign papillomas, and possibly even those with atypia? There is little data to answer this question. It is known that biopsy with vacuum-assisted devices can remove entire lesions, generally those of a size less than 1 cm [21–23]. Most papillomas fall into this size range, and thus, theoretically could be effectively removed percutaneously. Removal of all or most of a lesion may improve diagnostic confidence, relieve or decrease symptomatic discharge, and possibly avoid the possibility of becoming malignant at a later point. Papillomas with atypia might be more accurately assessed as to whether or not they classify as a papillary carcinoma.

There are very few reports of percutaneous removal of papillomas with a vacuum-assisted biopsy device in the literature. The largest series was reported by Dennis *et al.* where percutaneous biopsy was used to not only establish a diagnosis, but also achieve symptomatic relief of nipple discharge in 49 patients

[24]. The majority of cases were performed in a vacuum device. In all patients a histologic diagnosis was established. Interestingly, the only case of atypia occurred in a lesion sampled with a 14-gauge automated needle. This proved to be ductal carcinoma in situ on excision. There were no cases of underestimation in the lesions sampled with the vacuum device, although only four patients underwent excision. Symptomatic relief was achieved in all but one patient, whose discharge was diminished but not resolved. This patient underwent subsequent surgery. Total excision (determined by sonography) occurred in 73%, with 80–100% excision achieved in 90% of patients. The mean size of lesions in this study was 9 mm. The complications encountered included hematomas in three patients, bleeding requiring thrombin treatment in one patient, and incidental biopsy of areola in one patient requiring plastic surgery repair.

Guenin reported the use of vacuum-assisted biopsy under stereotactic guidance performed immediately following galactography [25]. Only patients with a focal intraductal filling defect were eligible and the procedure resulted in symptomatic relief in all. Atypia was found in only one patient, in whom surgical excision was found to have no atypia or residual papilloma.

These reports demonstrate that symptomatic relief can be achieved in the majority of patients with vacuum-assisted biopsy, potentially saving on the costs and morbidity of surgical intervention. Atypia was not a major issue in these studies, perhaps due to the use of the vacuum device in most cases.

Attempts at complete removal of papillary lesions with a vacuum-assisted device, thus, has benefits over simply diagnostic sampling with a core needle in the subgroup of patients with solitary, symptomatic lesions with a high likelihood of being a papilloma. The increased cost of vacuum-assisted biopsy instead of automated biopsy for sonographic biopsy in general, however, would have to be assessed in terms of the number of patients avoiding surgery. Such a cost benefit analysis would likely show the percutaneous method to be cost effective as long as the number of cases requiring subsequent surgery was a minimum.

The problems faced, however, with this approach include the uncertainty whether surgery can really safely be avoided in lesions demonstrating atypia, and the fact that many papillary lesions are not known 'a priori.' While intraductal masses found in central ducts have a very good chance of proving to be a papilloma, many papillomas are found incidentally, often on biopsy of calcifications. It is well documented that seemingly complete excision of lesions by vacuum-assisted biopsy (by complete removal of

the mammographic findings) does not ensure lack of residual disease, particularly for malignant lesions [21–23]. Confounding factors such as anesthetic administration, hemorrhage, and obscuring effect of the biopsy probe make it difficult to ensure complete radiological removal at time of biopsy.

In conclusion, papillary lesions of the breast are fairly common on imaging-guided breast biopsy, and the management remains controversial. In appropriate cases, an attempt at removal with vacuum-assisted biopsy appears a reasonable approach with the hopes of establishing a diagnosis, relieving symptoms of nipple discharge, and avoiding the cost and morbidity of surgical intervention. The management of lesions with atypia on mammotome excision will remain controversial and the prudent approach is to recommend complete surgical excision. Hopefully, further studies will help to elucidate the natural history and risks associated with these heterogeneous lesions.

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