Encapsulated papillary carcinoma without concurrent breast cancer in an axillary lymph node

Kevin Toolan; Carter Do; Ankica Braun; Paolo Gattuso; Rosalinda Alvarado*
Department of Surgery, Department of Pathology, Rush University Medical Center, USA.

*Corresponding Author: Rosalinda Alvarado
Department of Surgery, Department of Pathology, Rush University Medical Center, USA.
Email: rosalinda_alvarado@rush.edu

Abstract
We report a case of encapsulated papillary carcinoma arising de novo in an axillary lymph node. This rare diagnosis is thought to occur via epithelial rest. Our case is suggestive of epithelial rest playing a role in our patient’s pathogenesis.

Keywords: Breast malignancy; Papilloma; Cancer; Axillary lymph node.

Introduction
Papillary carcinoma is a rare type of invasive ductal carcinoma that typically does not metastasize to the lymph nodes. Even rarer is the presence of papillary carcinoma in the axillary lymph node without concurrent breast carcinoma. Only a few case reports highlight this phenomenon [1]. Two mechanisms were hypothesized: (1) cellular displacement of normal or pathologic breast tissue through surgical or needle manipulation or (2) embryonic malformation leading to epithelial rest in the lymph node [2]. We present a case of axillary lymph node papillary carcinoma in a patient with a history of intraductal papilloma and progressive axillary lymph node biopsy findings.

Case description
Our patient is a 65-year-old woman who presented to the breast surgeon to evaluate a right axillary mass. Her past medical history was significant for right intraductal papilloma without atypia (Table 1). Six years before presentation the patient was found to have intraductal papilloma without atypia. A biopsy of the right axillary lymph node at that time showed a benign reactive lymph node with a microscopic focus on epithelial inclusion. She remained stable for almost four years until she noticed a slow-growing lump over two years, prompting her to obtain a mammogram and ultrasound in March 2022. Her imaging revealed a 2.7 x 1.7 x 2.6 cm cystic right axillary nodular mass with septation, eccentric wall thickening, and internal vascularity. On exam, the lump was non-tender, non-fluctuant and mobile. She underwent a core needle biopsy (CNB) of the axillary mass. Pathology revealed intraductal papillary neoplasm with associated atypia. A portion of lymphoid tissue was adjacent to the papillary lesion presence of germinal centers and a capsule, which represents a portion of a lymph node. Immunohistochemical stains showed loss of staining for cytokeratin 5 and smooth muscle actin, whereas estrogen receptors showed strong diffuse staining (Figure 1). Excision of the lesion was recommended to rule out ductal carcinoma in situ (DCIS). The follow-up excision demonstrated an atypical papillary lesion with monomorphic cells showing low-grade nuclear atypia (Figure 2). Immunohistochemical stains for CK5, SMMS, and p63 showed loss of staining for myoepithelial cells both within the fibrovascular cores and at the periphery of the lesion. Based on these findings, a diagnosis of encapsulated papillary carcinoma arising in an intraductal papilloma within a lymph node was rendered. Although a portion of benign papilloma was identified in the biopsy specimen, no residual benign papilloma was present. The presence of benign epithelial inclusion was identified also in this specimen (Figure 1A). All margins were negative for DCIS (Table 1).
On 10-day follow-up, the patient underwent right axillary se-
roma aspiration and drain placement for persistent seroma. To-
tal body bone and CT scans were negative for distant meta-
stasy. She was started on Anastrozole. Adjuvant radiation therapy
was not recommended.

Discussion

Our case demonstrates a rare presentation of papillary car-
cinoma in an axillary lymph node. The absence of concurrent
breast carcinoma suggests an etiology that does not follow
the characteristic mechanism of metastasis of cancer from the
breast to the lymph nodes.

Bleisweiss et al. found that the friable nature of intraductal
papilloma can make them prone to fragmentation, dislodge-
ment, and passive transport to axillary lymph nodes [3,4]. While
a reasonable hypothesis, it does not fit well with our case pre-
sentation given the initial breast biopsy was without atypia. In
our case, we propose a different etiology for our patient’s pa-
thology.

Benign epithelial inclusions were discovered in her CNB from
07/2015 and were also redemonstrated in the excision speci-
men from 5/2022. These cellular findings have been attributed
to epithelial rests during embryonic development [1,3,5]. It is
reasonable to conclude embryonic arrest followed by malignant
transformation occurred independent of our patient’s breast
pathology. Srinivasan et al. investigated the significance of be-
nign epithelial inclusions in an axillary lymph node, concluding
that these nodal inclusions developed into DCIS in their patient
[3]. It is reasonable to apply this pathogenesis to our case be-
cause DCIS and papillary carcinoma share ductal tissue as tissue
of origin.

We hypothesize that the epithelial cells within the axillary
lymph node transformed into intraductal papilloma, developing
into papillary carcinoma. This is supported by the presence of
a portion of benign intraductal papilloma in the biopsy prior to
the excision which showed encapsulated papillary carcinoma.
The current literature suggests presence of ectopic breast tissue
to be an incidental microscopic finding with unclear diagnostic
significance. There are no recommendations for monitoring for
proliferative changes in benign epithelial inclusions, likely due
to the rarity of them becoming malignancies [6]. Despite the
infrequency of de novo carcinomas developing in an axillary
lymph node, pathologists and clinicians should be aware of the
possible occurrence and proliferation that can take place.
We present a rare cancer and place it in the context of the current understanding of axillary cancer. Our study is limited by its retrospective nature; however, the significant number of biopsies should provide assurance that all important timepoints were captured in the pathogenesis of our patient’s cancer. Future studies, preferentially in a prospective manner, are warranted to further elucidate the pathogenesis and etiology of papillary carcinoma in axillary lymph nodes.

References


Table 1: Progression of right breast/axillary lymph node findings.

<table>
<thead>
<tr>
<th>Date</th>
<th>Test</th>
<th>Sample</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>(01/2015)</td>
<td>CNB</td>
<td>Breast (12:00)</td>
<td>Intraductal papilloma w/o atypia; ER+ (&gt;90%); p63+</td>
</tr>
<tr>
<td>(07/2015)</td>
<td>FNA</td>
<td>Breast cystic fluid</td>
<td>Benign, consistent with abscess</td>
</tr>
<tr>
<td></td>
<td>CNB</td>
<td>Axillary LN</td>
<td>Benign lymph node; microscopic focus of benign epithelial inclusion</td>
</tr>
<tr>
<td>(01/2016)</td>
<td>FNA</td>
<td>Axillary LN</td>
<td>Reactive lymph node; predominately small lymphocytes and few lymphohistiocytic groups</td>
</tr>
<tr>
<td>(02/2016)</td>
<td>Post-Op Path Report</td>
<td>Breast (12:00)</td>
<td>Intraductal papilloma w/o atypia; ER+ (&gt;90%); p63+, cytokeratin5+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nipple (behind)</td>
<td>Benign breast tissue</td>
</tr>
<tr>
<td></td>
<td>Post-Op Path Report</td>
<td>Axillary LN</td>
<td>Atypical papillary lesion, consistent with an encapsulated papillary carcinoma, nuclear grade 12, arising within a lymph node. ER+/PR+; p63</td>
</tr>
</tbody>
</table>

FNA: fine needle aspiration; CNB: core needle biopsy.