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Short Communication

Ingrained and Jutting-Encapsulated Papillary Carcinoma Breast

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Encapsulated papillary carcinoma breast emerges as an expansible papillary neoplasm commonly implicating postmenopausal female subjects. Additionally designated as encysted papillary carcinoma, the nomenclature of intra-cystic papillary carcinoma breast is not recommended.

The papillary tumour is comprised of delicate papillary fronds impregnated with distinct fibro-vascular core and confined to ducts with cystic dilatation. Papillary structures are layered by cuboidal to columnar epithelium. Tumour cell nuclei depict low grade or intermediate grade atypia. Neoplasm is circumscribed by a dense fibrous tissue capsule. Myoepithelial cell component appears absent, especially along neoplastic papillae and tumour perimeter. Exceptionally, focal aggregates of myoepithelial cells are expounded at tumour periphery.

In the absence of invasive carcinoma component, tumour staging is concordant with staging of ductal carcinoma *in situ* (DCIS). Encapsulated papillary carcinoma breast delineating high grade cytological atypia and elevated mitotic activity is exceptionally encountered. Aforesaid lesions are suitably classified as high grade invasive carcinoma breast delineating histological features of encapsulated papillary carcinoma wherein tumour staging as an invasive carcinoma breast may be contemplated.

Encapsulated papillary carcinoma breast commonly emerges within postmenopausal females wherein female subjects within seventh decade are commonly implicated. Tumefaction is exceptionally discerned within males [1,2].

Generally, neoplasm occurs within breast tissue with predilection for centric zones [1,2].

Of obscure aetiology, neoplasm manifests with debatable pathogenesis. Tumefaction may ambiguously be classified as a variant of ductal carcinoma *in situ* (DCIS). Lesion is associated with progression from *in situ* disease into distinctly invasive carcinoma breast with a 'pushing' tumour margin. Generally, the low grade, infiltrative neoplasm is associated with an indolent biological course.

Encapsulated papillary carcinoma appears to simulate low grade, invasive carcinoma breast and is immune reactive to oestrogen receptors. Generally a 'luminal A' subtype, tumefaction frequently depicts genetic mutations of PIK3CA. Tumour cells display losses within chromosome 16q and gains within chromosome 16p or 1q. Copy number alterations appear reminiscent of solid papillary carcinoma and invasive papillary carcinoma breast [2,3].

Encapsulated papillary carcinoma breast may represent with a palpable tumefaction or nipple discharge [2,3].

Specific diagnostic criterion upon cytological assessment segregating encapsulated papillary carcinoma from various benign papillary lesions of breast appear absent. With decimated sensitivity and specificity of precise tumour discernment, papillary lesions discerned upon fine needle aspiration cytology (FNAC) necessitate confirmation and appropriate categorization with histological assessment of surgical tissue samples.

Cytological smears appear hyper-cellular with configuration of cell balls or slender papillae configured of tumour cells delineating mild cytological atypia [2,3].

Grossly, a well circumscribed, solid to papillary tumour mass is observed. Neoplasm appears to expand into a cystic space encompassed by a distinct fibrous tissue capsule. Typically, tumour magnitude varies between 1 centimetre to 2 centimetres [3,4].

Upon microscopy, a papillary tumefaction with 'pushing' perimeter is observed. Neoplasm appears confined within a duct demonstrating cystic dilatation which is encompassed within thick fibrous tissue capsule. Neoplasm may expound solid cell nests or 'cribriform' architecture [3,4].

The delicate, papillary fronds are layered with cuboidal to columnar epithelium delineating minimal to moderate cellular and nuclear atypia. Papillary projections are impregnated with distinct cores of fibro-vascular tissue. Neoplasm preponderantly demonstrates complete absence of myoepithelial cells along papillary structures and tumour periphery.

Mitotic activity is minimal at an average of 3 mitoses per 10 high power fields (HPFs) [3,4].

Tumefaction appears immune reactive to basement membrane biomarkers as type IV collagen or laminin, especially upon tumour periphery.

Invasive carcinoma categorically demonstrates neoplastic cells which infiltrate beyond fibrous tissue capsule.

Concurrent invasive carcinoma breast no special type (IDC NST) commonly emerges as a low grade, miniature neoplasm of T1 stage which appears immune reactive to oestrogen receptors (ER+) and immune non reactive to HER2- [4,5].

Cogent tumour staging pertains to factors such as magnitude of classic invasive component, where represented. Notwithstanding, displacement of epithelial cells or entrapment of neoplastic cells within surrounding fibrous tissue capsule may ensue and necessitates demarcation from 'true' neoplastic invasion beyond fibrous tissue capsule [4,5].

High grade invasive carcinoma breast with features of encapsulated papillary carcinoma may represent with significant, high grade cytological atypia, pleomorphic nuclei, occasional tumour necrosis and frequent mitotic activity with mean mitotic figures at 22 per 10 high power fields (HPFs). Commonly, high grade lesions appear immune non reactive to oestrogen receptors (ER-) or triple negative with immune non reactivity to oestrogen receptors, progesterone receptors and HER2 [4,5].

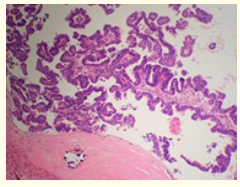

Figure 1: Encapsulated papillary carcinoma delineating papillary articulations layered by columnar epithelium and impregnated with distinct fibro-vascular cores encompassed within thick fibrous tissue capsule [9].

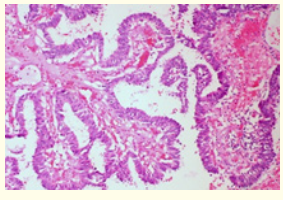

Figure 2: Encapsulated papillary carcinoma exhibiting papillary structures layered by columnar epithelium and pervaded with distinct fibro-vascular cores enmeshed within thick fibrous tissue capsule [10].

Score	(a)	(b)	(c)
1 point	0-5	0-9	0-11
2 points	6-11	10-19	12-22
3 points	11+	20+	23+

Table 1: Quantifiable mitotic figures in proliferating zones/10hpf [3,4].

~(a) field diameter of 0.44 millimetres

~(b) field diameter of 0.59 millimetres

~(c) field diameter of 0.63 millimetres

Encapsulated papillary carcinoma breast appears intensely and diffusely immune reactive to oestrogen receptors (ER) or progesterone receptors (PR).

Tumour cells appear immune non reactive to myoepithelial biomarkers as p63, calponin, actin, smooth muscle myosin heavy chain (SMMHA) or CD10. Besides, immune non reactivity to HER2, chromogranin or synaptophysin is observed [5,6].

Stage	T score	N score	M score
0	Tis	N0	M0
Stage I			
IA	T1	N0	M0
IB	T0	N1(mi+)	M0
IB	T1	N1(mi+)	M0
Stage II			
IIA	T0	N1	M0
IIA	T1	N1	M0
IIA	T2	N0	M0
IIB	T2	N1	M0
IIB	T3	N0	M0
Stage III			
IIIA	T0	N2	M0
IIIA	T1	N2	M0
IIIA	T2	N2	M0
IIIA	T3	N1 or N2	M0
IIIB	T4	N0,N1or N2	M0
IIIC	Any T score	N3	M0
Stage IV			
IV	Any T score	Any N score	M1

Table 2: Pathologic staging of invasive carcinoma breast (NOS) [4,5].

Encapsulated papillary carcinoma breast requires segregation from neoplasms as papilloma with atypical ductal hyperplasia (ADH) or ductal carcinoma *in situ* (DCIS), papillary ductal carcinoma *in situ* (DCIS), intra-ductal papilloma, solid papillary carcinoma, invasive papillary carcinoma, invasive lobular carcinoma with papillary growth pattern as classic invasive lobular carcinoma, atypical lobular neoplasia or lobular carcinoma *in situ* beyond the capsule [5,6].

Upon imaging, distinctive features segregating between subtypes of papillary carcinoma breast remain obscure. Besides, cogent discernment of encapsulated papillary carcinoma breast demonstrating or devoid of tumour invasion beyond the capsule may be challenging. Mammography depicts a lobulated, spherical to elliptical, well circumscribed tumour mass with irregular, angulated or multi-lobulated neoplastic perimeter. Tumour calcification is uncommon.

Ultrasonography expounds a solid, hypoechoic tumour mass with an occasional cystic component [6,7].

Colour Doppler studies are optimal in defining prominent vascular perfusion of the tumour.

Magnetic resonance imaging (MRI) exemplifies a spherical to elliptical, well defined, heterogeneous tumour mass demonstrating variable signal intensity, contingent to cystic fluid content.

Neoplasm may be appropriately ascertained by histological evaluation of tumour tissue extracted by biopsy or surgical excision [6,7].

Encapsulated papillary carcinoma breast may optimally managed with singular surgical extermination of the lesion, akin to *in*

situ carcinoma. Sentinel lymph node tissue sampling of axillary lymph nodes appears to be of debatable efficacy.

Certain instances may be managed with cogent hormonal therapy. However, adoption of neoadjuvant or adjuvant chemotherapy remains superfluous [7,8].

Neoplasm is associated with indolent biological behaviour and excellent prognostic outcomes.

Low grade or intermediate grade encapsulated papillary carcinoma breast in the absence of conventional invasive carcinoma component displays biological and clinical behaviour identical to ductal carcinoma *in situ* (DCIS) wherein the neoplasm is staged as ductal carcinoma *in situ* (DCIS) in the absence of invasive carcinoma component [7,8].

Neoplasm depicts > 95% 10 year survival, especially within lesions devoid of associated invasive carcinoma. Localized tumour reoccurrence emerges at ~7% whereas regional lymph node metastases is exceptionally encountered in up to 3% neoplasms.

Neoplasms associated with invasion beyond tumour capsule may be subjected to tumour staging contingent to magnitude of invasive component, regardless of magnitude of primary encapsulated papillary carcinoma [7,8].

Subjects demonstrating genesis of invasive carcinoma breast from encapsulated papillary carcinoma delineate superior prognostic outcomes, in contrast to conventional invasive carcinoma exemplifying concordant factors as tumour stage and age of incriminated subject.

High grade invasive carcinoma breast delineating morphological features of encapsulated papillary carcinoma exhibit decimated incidence of ~3% and represent with clinical behaviour identical to invasive carcinoma. However, propensity of regional lymph node or vascular invasion along with regional lymph node metastases is enhanced, in contrast to low grade and intermediate grade encapsulated papillary carcinoma.

Neoplasm is appropriately categorized as high grade invasive carcinoma breast carcinoma with morphological features reminiscent of encapsulated papillary carcinoma and tumour staging as applicable to invasive carcinoma breast [7,8].

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9. Image 1 Courtesy: Libre pathology.
10. Image 2 Courtesy: Wikipedia.com.