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Key Concepts to Review:

- Central vs peripheral papillomas
- Solitary vs multiple papillomas
- Clinical presentation of papillomas
- Papillary Carcinoma
- Management of papillary lesions of the breast

Central papilloma:

- Usually a solitary lesion in a dilated duct in the anterior subareolar region.
- A classic presentation would be pathologic nipple discharge—spontaneous, clear or bloody, unilateral discharge. These are much more likely to present with symptomatic discharge than a peripheral papilloma.
- This is the most common type of papilloma. These can be evaluated with mammogram and ultrasound. On mammogram you would expect to see a subareolar mass and/or single duct enlargement. On ultrasound you are looking for an intraductal mass within a dilated duct with a vascular stalk on color Doppler imaging.
- On galactography, look for a filling defect within a dilated duct. Note that galactography is frequently tested but rarely performed at many breast imaging centers. Know that bubbles of air injected at time of galactography can give the appearance of a filling defect so you need to ensure no air is injected to lower the chance of calling a filling defect from a bubble of air a potential papilloma.
- Surgeons also can perform ductoscopy or duct excision for diagnosis and treatment of a papilloma. Ductoscopy involves using a tiny fiberoptic camera to cannulate and evaluate the duct that is shown on clinical exam as the source of pathologic nipple discharge.
- If you have a clinical history of pathologic nipple discharge and a diagnostic mammogram and subareolar ultrasound are negative, it would be appropriate to get a breast MRI for further evaluation. It would also be appropriate to send the patient for surgical consultation so they can evaluate the patient and consider ductoscopy or surgery to evaluate and treat the pathologic nipple discharge.
- On MRI you would look for a small enhancing focus or mass, possibly associated with a dilated duct. A papilloma may demonstrate washout kinetics as these are vascular lesions.
- Management can include surgical excision, especially if the papilloma demonstrates atypia. Many centers routinely excise all papillomas, others do not, but for the ABR core exam, if you are asked you should select that a papilloma should be excised, regardless of presence of atypia.
- Be aware that on ultrasound, hypoechoic material within a duct that does not demonstrate internal vascularity or a feeding vessel could be a papilloma or could be inspissated secretions within a duct. Sometimes biopsy is needed to differentiate these.

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Peripheral papilloma(s):

- Much more likely to be multiple.
- These arise from the terminal-duct lobular units (TDLU). Note that the TDLU is where most breast cancers develop and that will help you remember that these have a higher malignancy rate than the single central papilloma. These are also more likely to be associated with atypia or malignancy.
- Unfortunately, these also are less likely to be detected early due to a lower chance of presenting with pathologic nipple discharge. These rather may present as a palpable mass or, preferably, be identified on a screening mammogram.
- Peripheral papillomas are less common than the central papilloma.
- Multiple peripheral papillomas aka papillomatosis of the breast are multiple papillomas in the TDLUs. You need to know that these women are at increased risk of developing breast cancer and you may see multiple masses on mammography and MRI.
- Management is difficult but may include annual MRI. You would biopsy or excise any papilloma that demonstrates suspicious change over time including enlargement or development of Type 3 washout kinetics on MRI.

Other papillary lesions:

Micropapillary DCIS:

- Uncommon subset of DCIS that has combination of multiple tiny intraductal papillomas and DCIS on histopathology.
- Micropapillary DCIS is more aggressive in terms of widespread extent, risk of microinvasion, and risk of recurrence following excision compared to standard DCIS.
- This may demonstrate pleomorphic calcifications on mammogram. Don't forget that you should always get subareolar magnification views in setting of pathologic nipple discharge to evaluate for subtle calcifications related to DCIS.

Papillary Carcinoma:

- Rare subset of breast cancer typically presenting in a postmenopausal woman.
- Demonstrates circumscribed margins in many cases. The mass may have associated suspicious calcifications on mammography.
- On ultrasound, look for a complex cyst with thick septations or classically a cystic mass with a vascular mural nodular component.
- On MRI expect an enhancing complex cyst with irregular enhancing nodular components.
- This could also present as a solid mass without cystic components but it is probably less likely to show you this appearance on board exams. I think it is more likely to present the intracystic papillary carcinoma variety on test questions.
- Differential consideration includes IDC with necrosis.