

THYROID PAPILLARY CARCINOMA

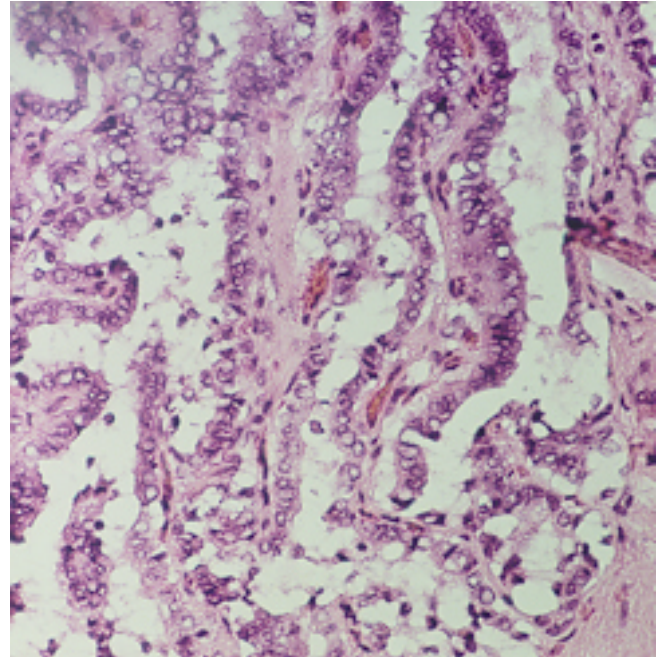
Papillary carcinoma is the most common of thyroid malignancies and occurs in all age groups but particularly in women under 45 years of age. There is a high rate of cervical metastatic disease and yet the overall ten year survival rate is about 90%. The tumor is not encapsulated and there are often multicentric foci that may be microscopic in size. In its most characteristic form, papillary carcinoma shows a great predominance of papillary structures throughout the tumor. However, it is rare for the tumor to be composed exclusively of papillae and in most cases the papillae are interspersed with neoplastic follicles. At times papillary carcinoma can grow in solid or trabecular formations and usually this is a focal change but it may involve most or all of the neoplasm.

Microscopically, there are several features that help identify the tumor. First, there are papillae which are conspicuous and frond-like; if compressed tightly, the papillary appearance may become lost. Second, tumor cells which are large and cuboidal or low columnar, may show nuclei with a ground glass (optically cleared or "Orphan Annie eye") appearance. These nuclei occur in a good half, but not all cases of papillary carcinoma. Third, there is crowding or overlapping of nuclei as though they are tumbling over one another. Fourth and fifth, longitudinal nuclear grooves and intranuclear cytoplasmic inclusions can be found in some specimens. Sixth, at least some follicles are present in most cases and these follicles characteristically show an elongated and scalloped appearance and the colloid tends to stain more deeply than is seen in the normal thyroid and is refractile. Seventh, psammoma bodies, laminated rings of calcium, are common, and the finding of an isolated psammoma body should raise suspicion that papillary carcinoma is present somewhere in the gland. Often the psammoma body is shattered so that it may not appear as a rounded mass. These calcific spherules are rare in other types of thyroid neoplasm. Finally, an occasional specimen shows foci of squamous, mucinous, or ciliated cell "metaplasia."

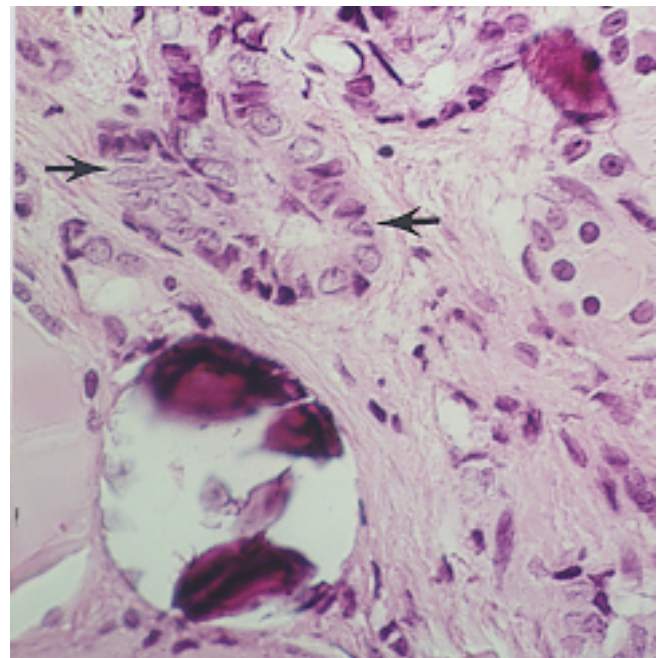
While there usually are at least a few colloid follicles, sometimes a papillary carcinoma seems to be almost entirely composed of follicles, with some cells demonstrating the ground glass nuclei typical of papillary carcinoma. In such a specimen, pathologists speak of "follicular variant" of papillary carcinoma. Difficulty may come in distinguishing between the follicular variant of papillary carcinoma and "true" follicular carcinoma. In the latter most of the characteristics listed above for papillary carcinoma are missing. Also in true follicular carcinoma there is a great tendency for capsular and vascular invasion by tumor, factors not found in papillary carcinoma.

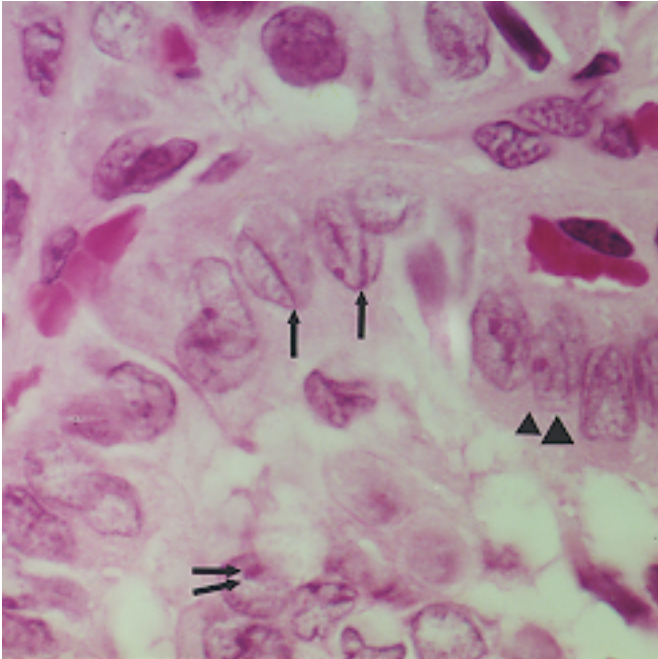
Further discussion is under follicular carcinoma of thyroid.

Papillary formations and ground glass (optically cleared or "Orphan Annie eye") nuclei. Nuclei appear crowded.

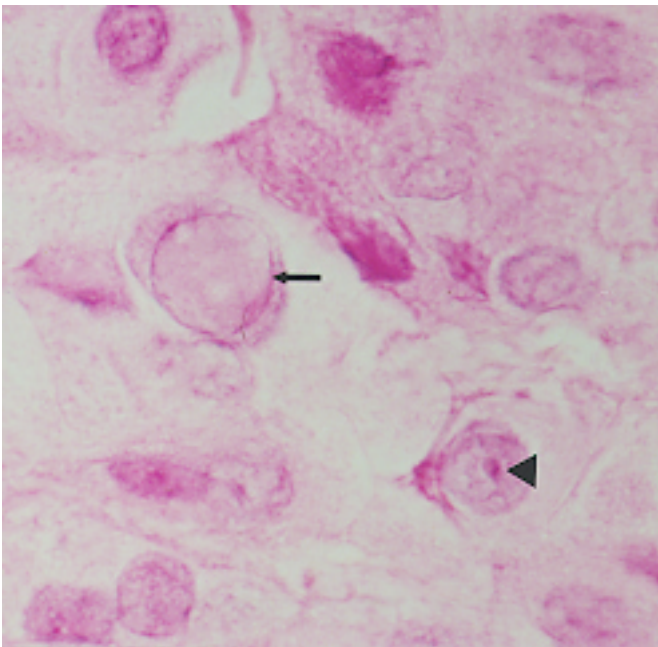


Psammoma body cracked into fragments with adjacent papillary adenocarcinoma showing an elongated tubule and crowding of nuclei (arrows).



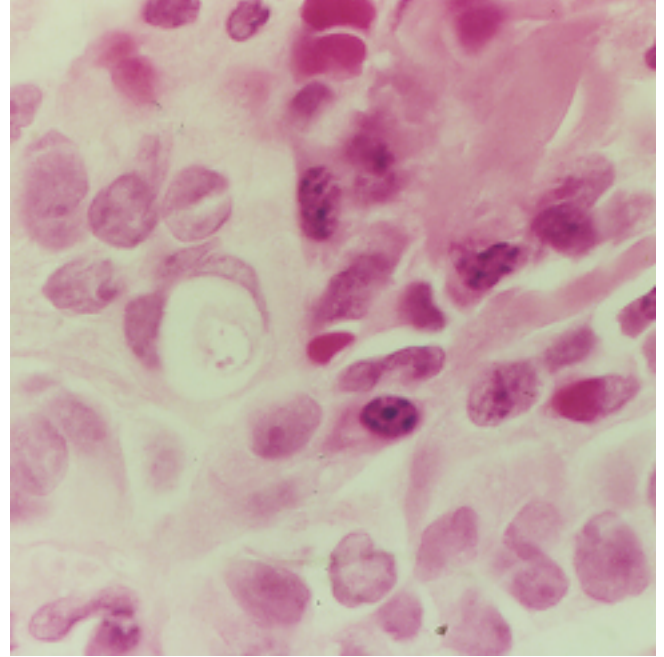


Longitudinally grooved nuclei (small arrows) and overlapping nuclei (triangles). Several nuclei show prominent reddish nucleoli (double arrows).

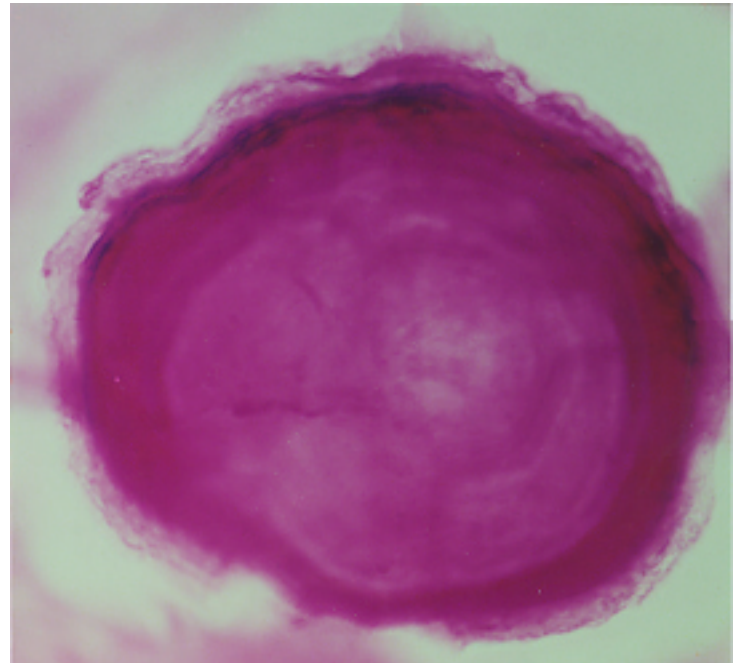


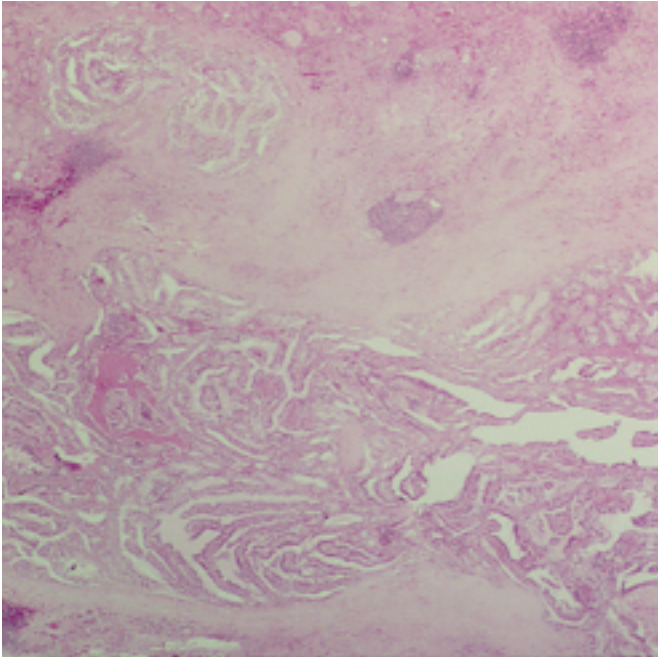
Large intranuclear pseudoinclusion in which the included cytoplasm is the same color as the cellular cytoplasm (arrow). Nucleoli are often prominent and red (triangle).

Artifact resembling an intranuclear pseudoinclusion but the seeming inclusion (arrow) lacks the color of cytoplasm.

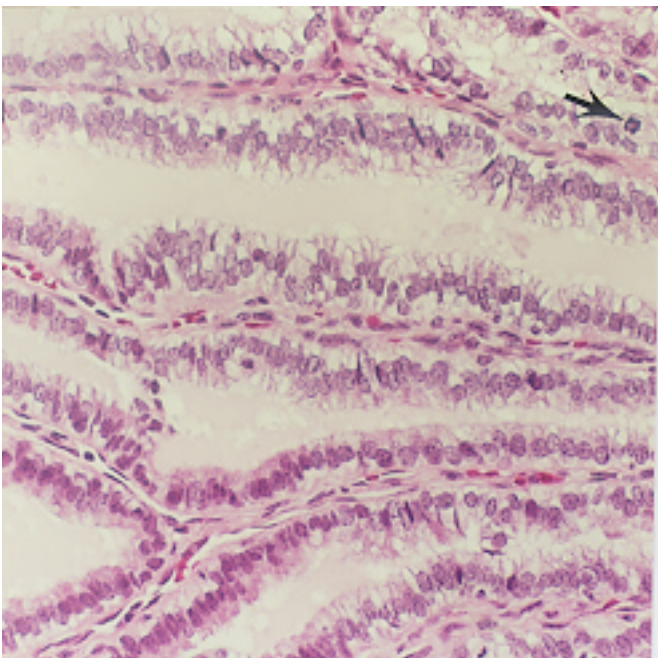


High power photo of intact psammoma body shows characteristic lamination.



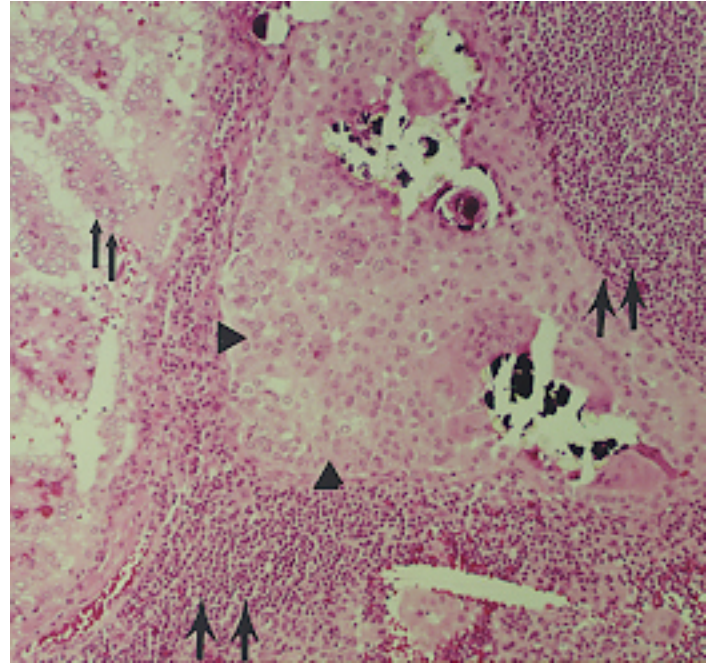


Showing how papillary formations may become packed together so that papillae are less evident. Actually, papillary adenocarcinoma with a pure papillary pattern is rare and most tumors have at least some follicular formations.

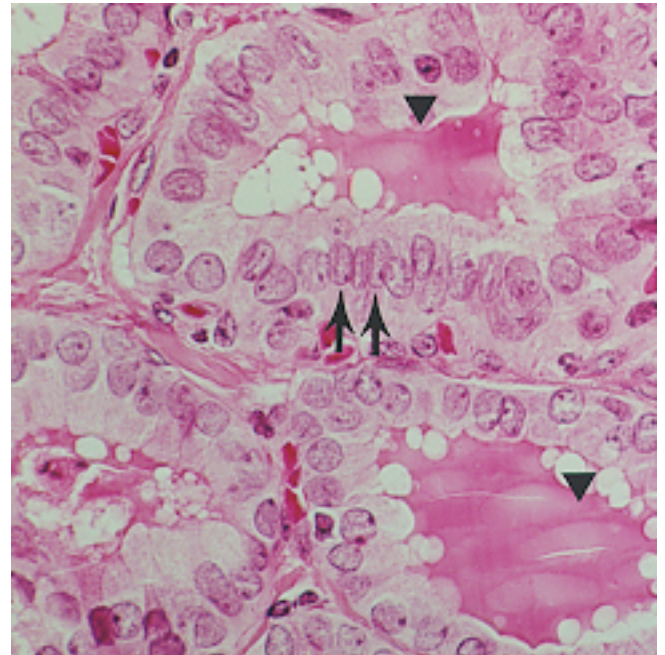


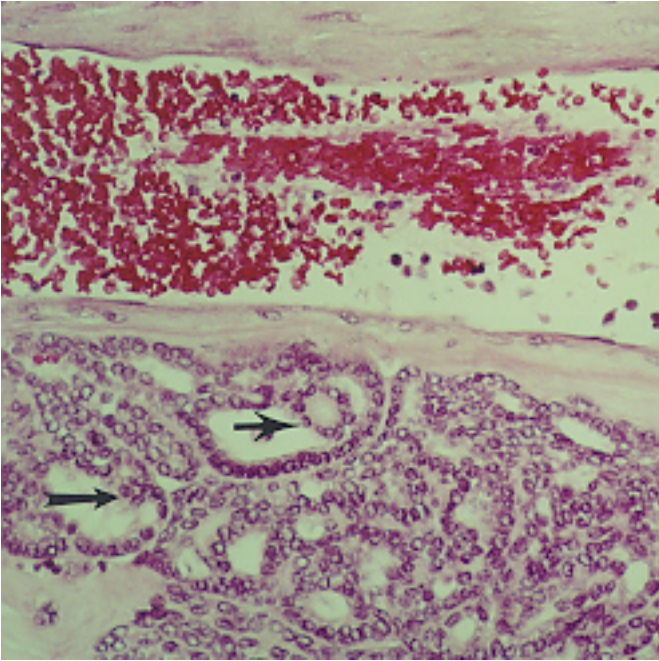
Papillary architecture with a blood vessel traversing each papilla. Arrow indicates a mitosis.

Papillary adenocarcinoma, metastatic, with papillae and ground glass nuclei (double arrows), calcifications (not psammoma bodies), and a focus of squamous metaplasia (triangles). The remaining tissue is lymph node (large arrows).

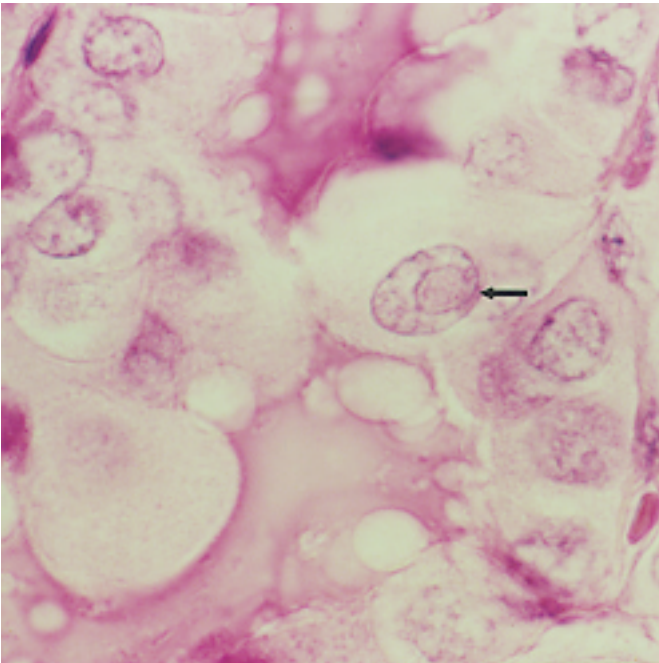


Papillary carcinoma, follicular variant. Scalloped, refractile colloid (triangles) within elongated follicles that have nuclear crowding and faintly seen nuclear grooves (arrows). Nucleoli are prominent.



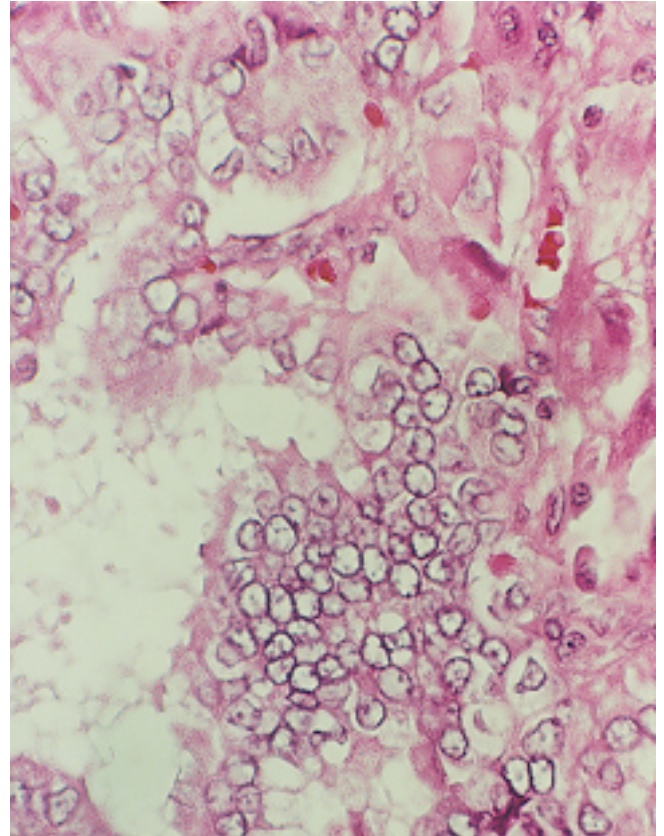


Papillary adenocarcinoma, follicular variant, adjacent to but not involving blood vessel. Note the cleared nuclei. Follicular lining cells in the follicular variant tend to weave in and out or to protrude into the follicles as if to form a small papilla (arrows).

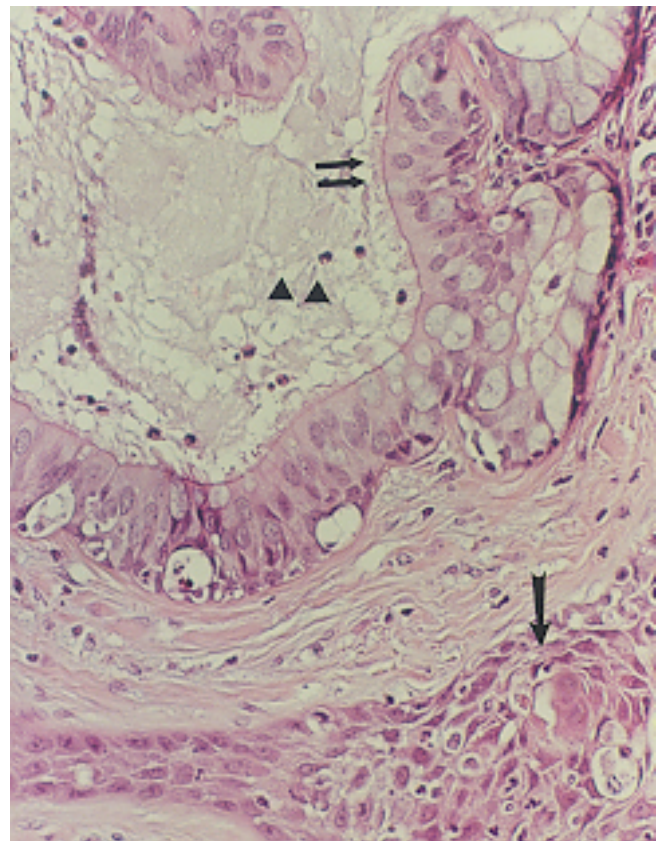


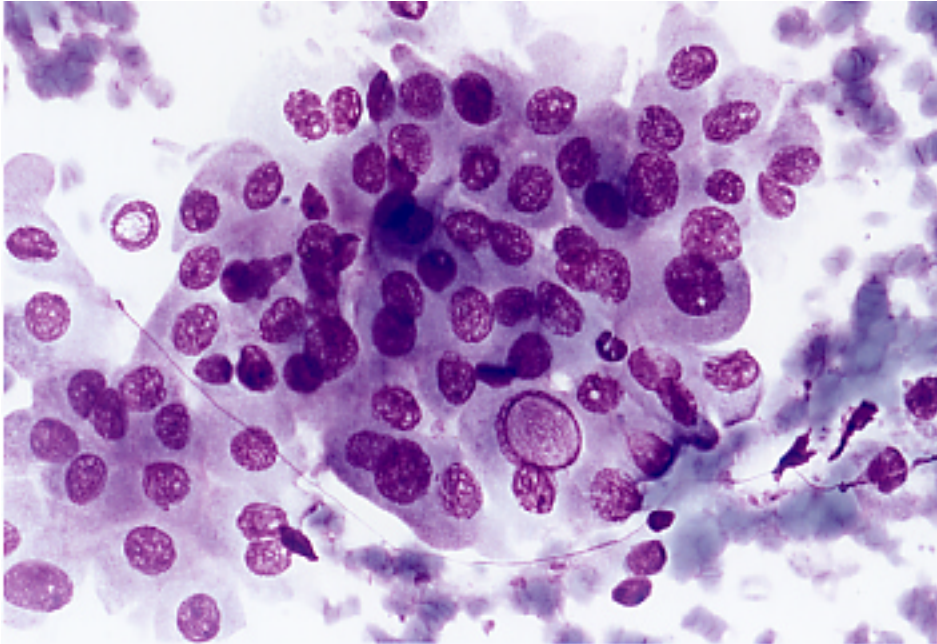
Nuclear pseudo-inclusion (arrow).

Papillary adenocarcinoma, showing “basket of eggs” appearance resulting from tangential sectioning of ground-glass nuclei.



Papillary carcinoma showing mucinous metaplasia (triangles), ciliary metaplasia (small arrows) and squamous metaplasia (single arrow).





Papillary carcinoma, Thyroid. FNAB of thyroid nodule. A tight cluster of cells with enlarged nuclei and moderate amount of cytoplasm is seen. Note the two intranuclear cytoplasmic pseudoinclusions in this field. One is large and the other is much smaller. Nuclear grooves which are another characteristic feature of papillary carcinoma are better seen in Papanicolaou stained smears. Diff-Quik stain.

CLINICAL ASPECTS

Papillary adenocarcinomas may exhibit indolent growth locally and yet readily metastasize to cervical lymph nodes and by hematogenous routes to bone and lung. Not infrequently the primary disease is discovered only after there is metastatic enlargement of a cervical lymph node. Spread beyond the thyroid capsule is common and carries a worsened prognosis. Surgical removal of the gland is the preferred treatment. Total thyroidectomy for metastatic disease is most often recommended and neck dissection is done for metastatic disease.

In papillary carcinoma age is a factor of paramount importance inasmuch as tumor deaths from papillary carcinoma are rare below the age of forty years, whereas the probability of a fatal outcome increases considerably with each decade after that. The overall probability of long term survival is excellent to the point that in some series the figures are not significantly different from those of a normal population of similar age. Blood vessel invasion is a feature of only modest prognostic impact, barely significant at the statistical level (in contrast to true follicular carcinoma). Even distant metastases such as to the lung, are associated with only a moderate deleterious effect on prognosis.