

Flower-Like Colloid on Thyroid Fine Needle Aspiration

Dear Dr. Bedrossian:

Recognizing colloid is an essential part of thyroid fine needle aspiration (FNA) interpretation as the quantity of colloid and the numbers follicular cell are very good indicators of the nature of the lesion. Here, we reported a unique colloid morphology observed in FNA specimen from a 47-year-old female patient with a history of breast cancer and long standing thyroid nodules. She had multiple cystic (largest measures $1.4 \times 1.3 \times 0.7$ cm) and solid nodules throughout both lobes of the thyroid gland by imaging (ultrasound) study. Many cystic nodules contained small internal hyper-echoic foci. Under ultrasound guidance, a 21 gauge needle was inserted in the largest, predominantly cystic nodule and aspirated approximately 0.5 ml of serosanguineous fluid. After aspiration, ultrasound examination of the right neck demonstrated this cystic nodule to be largely decompressed with minimal residual fluid. The sample was sent to pathology for analysis.

One ThinPrep (TP) and one cell block slide were made for morphological evaluation. There were scattered benign appearing follicular cell groups, some with Hurthle cell change, and rare foamy macrophages. The most interesting finding was the presence of numerous numbers of flower-like crystalloid structures of different size but with similar configuration. Small ones had single layer of structures forming flower-petals like arrangement while the larger ones had multiple layers of those pedals (Figs. 1A and B). Although unusual, these crystalloid structures were interpreted as colloid based on morphology. The cell block section (Fig. 1C) was subjected to immunocytochemical stain and these structures were positive for thyroglobulin (Fig. 1D) and negative for vimentin (indi-

cating the specificity of thyroglobulin stain, not shown), supporting them being colloid. A diagnosis of colloid nodule (nodular hyperplasia) was rendered based on the abundance of colloid and sufficient numbers of follicular cells.

Colloid is frequently observed on thyroid fine needle aspiration specimen. Its morphology feature is well documented and readily recognized. It usually presents as thin/watery or thick/dense colloid. Thin/watery colloid is usually appreciated on Diff-Quik (DQ) and Papanicolaou (Pap) stained smear as a thin layer of pink to purple (DQ) or blue (Pap) amorphous material with liner cracking artifact but it is usually lost on TP slide. The thick or dense colloid, on the other hand, can be appreciated equally well on both DQ or PAP stain smears and TP slide. Thick colloid usually appears as round or irregular shaped chips displaying cracking artifact on the side with either homogeneous pink/purple (DQ) or blue (Pap or TP) color. Sometime these structures display two-tone color that is yellow/orange in the central area and blue/purple on the edge (on Pap or TP). Colloid can also be seen on routine haematoxylin and eosin (H&E) stained cell block slide as dense pink homogenous material. The unique morphology of colloid in our case has not been described in the literature either in conventional smears or with TP or other liquid based preparations. The basis for formation of such a structure of colloid remains unclear although change of electrolytes or certain drugs may contribute to its formation. In this patient, chemotherapy and local radiation to the neck region may also have had a role in facilitating such structure formation. It would be of interest to recognize further examples of this peculiar appearance of colloid, to establish its etiology more definitively.

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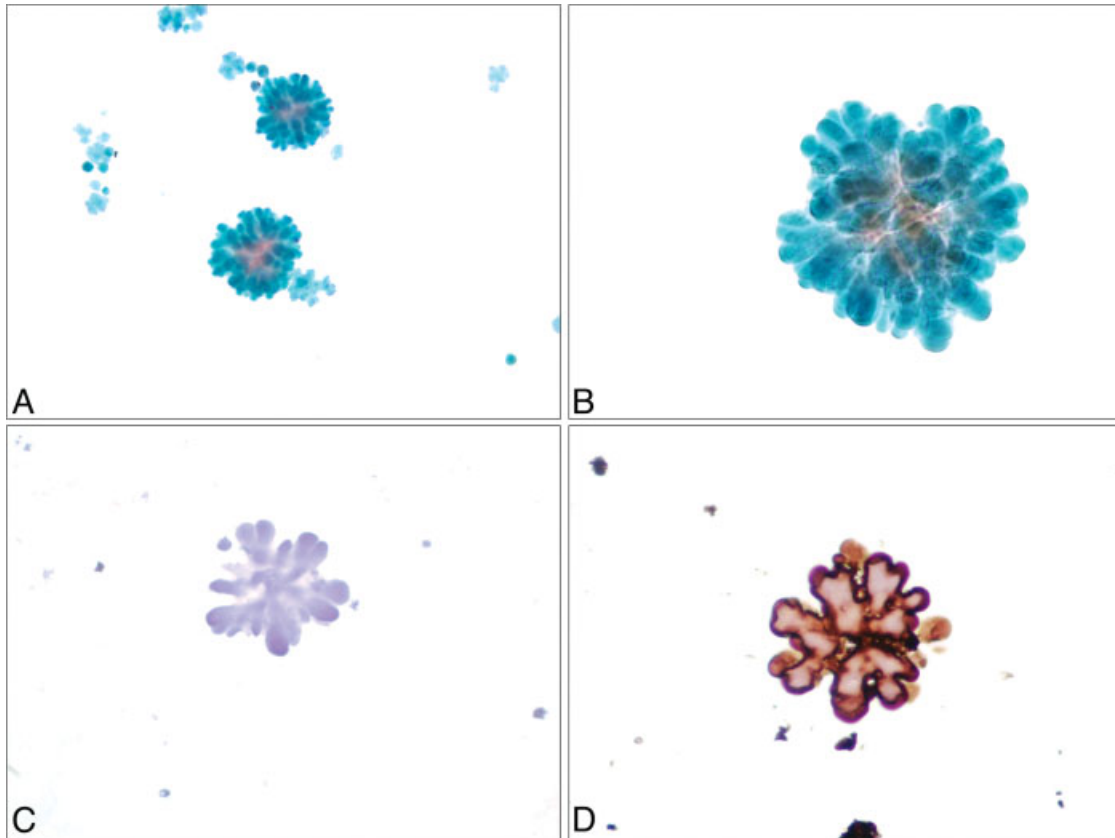


Fig. 1. Composite images of flower like colloid. (A) $\times 200$ magnification from ThinPrep slide by Papanicolaou stain; (B) $\times 600$ magnification, Thin-Prep slide by Papanicolaou stain; (C) $\times 400$ magnification, cell block by H&E stain; (D) $\times 400$ magnification immunocytochemical stain with anti-thyroglobulin antibody. [Color figure can be viewed in the online issue, which is available at www.interscience.wiley.com.]