

AN UNUSUAL CAUSE OF HEMATURIA

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QUESTIONS:

1. What is the histological feature that is required for the unequivocal diagnosis of follicular carcinoma of the thyroid gland?
2. Which is the preferred route of metastatic spread of follicular thyroid carcinoma?

CLINICAL ASPECTS:

A 59-year-old woman presented to her physician with the complaint of painless hematuria of one-month's duration. Diagnostic evaluation included cystoscopy, which demonstrated a 2.0 cm papillary tumor in the bladder that was resected cystoscopically. Histology demonstrated a follicular malignancy, which stained positive for thyroglobulin (Figures 1A and 1B) confirming the diagnosis of metastatic follicular thyroid carcinoma.

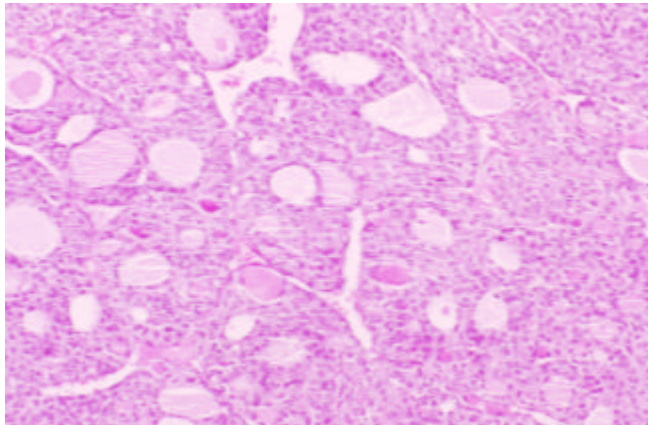


Fig. 1A: Cellular neoplasm showing formation of follicles containing colloid.

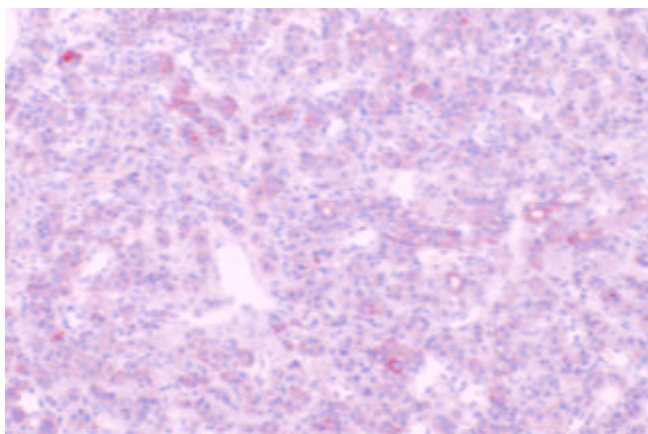


Fig 1B: Immunoperoxidase stain for thyroglobulin. Shows positive staining focally.

Physical examination demonstrated a 10.0 cm left thyroid nodule (Figure 2). A total thyroidectomy was performed (Figure 3) – regional node sampling was negative. Histology was compatible with a follicular thyroid cancer with both vascular and capsular invasion (Figures 4A, 4B, and 4C).



Fig. 2: Large left-sided thyroid mass.

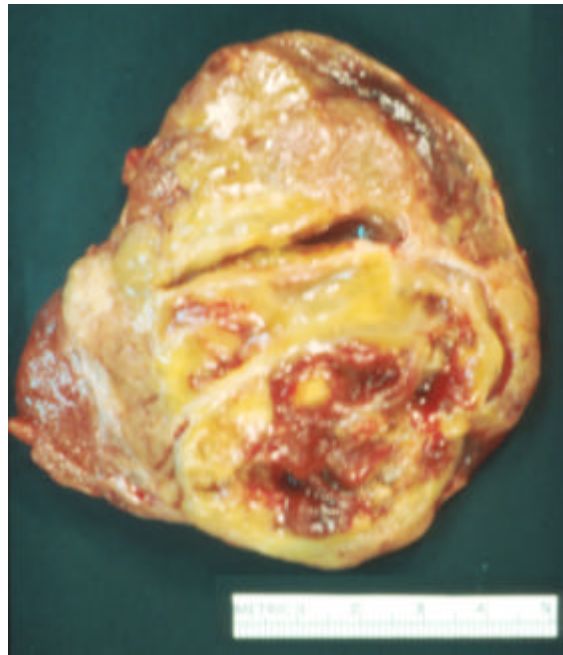


Fig. 3: Necrotic hemorrhagic follicular carcinoma.

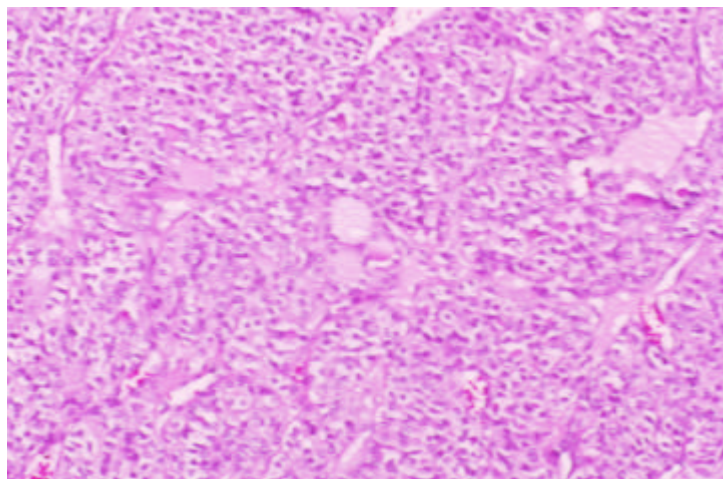


Fig. 4A: Tumor from the showing tumor cells forming follicles. Little colloid is seen.

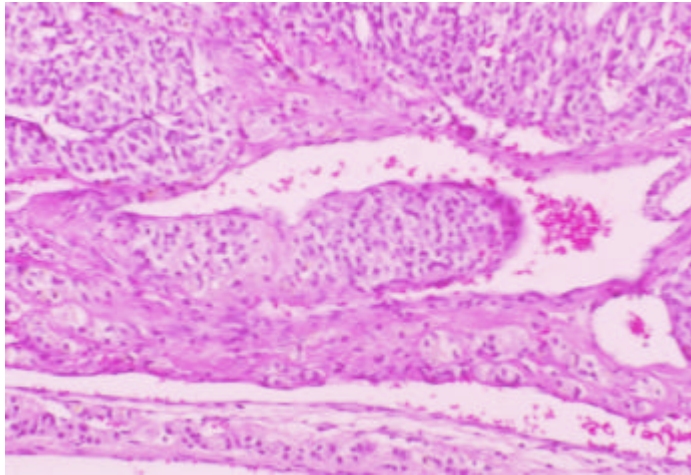


Fig. 4B: Vascular invasion seen as a tongue of tumor clearly within a vessel.

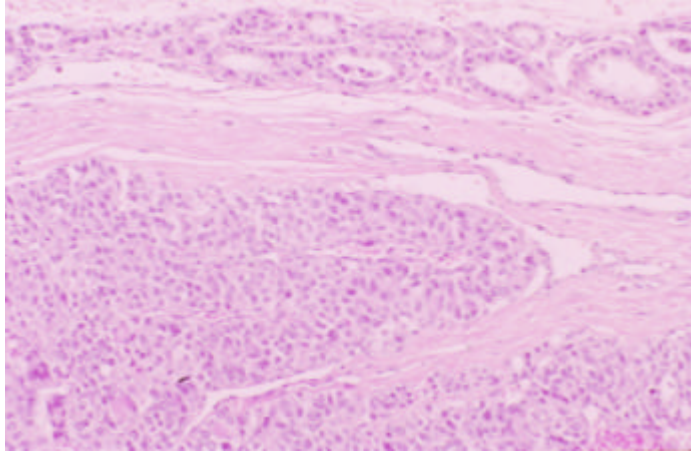
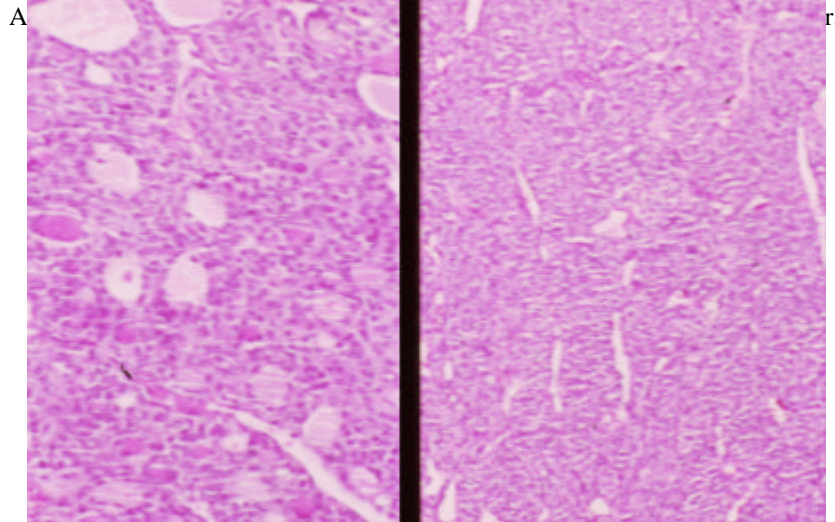


Fig. 4C: Higher power appearance of vascular invasion.

The thyroid histology was similar to that found in the bladder tumor (Figure 5).

Fig. 5: Bladder metastasis (left) compared to the primary thyroid tumor (right).



Three months following thyroidectomy, a chest x-ray demonstrated multiple, bilateral lung nodules (Figure 6) compatible with metastatic disease – so called “cannon-ball” metastases. Despite treatment with large doses of radioactive iodine, the patient died of “multiple pulmonary emboli” five months later.

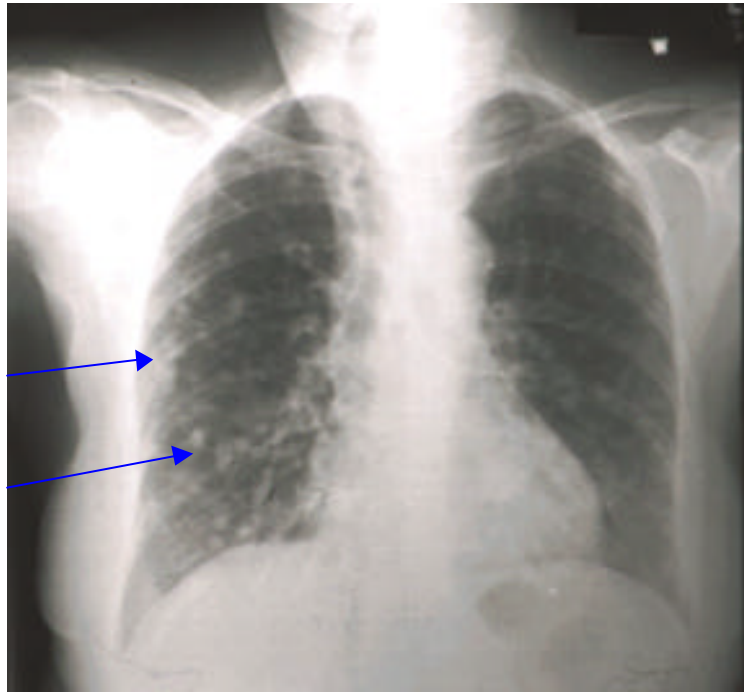


Fig. 6: Chest x-ray showing multiple bilateral metastases

DATA SUMMARY

Follicular carcinoma of the thyroid gland (FC) is a relatively rare thyroid malignancy accounting for approximately 10% of thyroid cancers. Most such tumors are > 4 cm in diameter. The histological diagnosis is not possible on fine-needle aspiration (FNA) and is based on the demonstration of vascular invasion by the tumor. To diagnose FC on the basis of capsular invasion is inaccurate, since the capsular invasion may well be artifactual in nature. In a study of 65 patients in whom the diagnosis of FC was made by the presence of capsular invasion alone (no vascular invasion), we found no recurrence and no disease-specific mortality despite a mean follow-up of 11 years. We have come to demand vascular invasion as the sine quo non for the definitive diagnosis of FC.

Because of the vascular invasion, the most common mode of spread is hematogenous with common sites being the long bones (e.g, femur), the lungs; and the skull (Figures 76A, 7B).



Fig. 7A: Large pulsating “noisy” skull metastases.

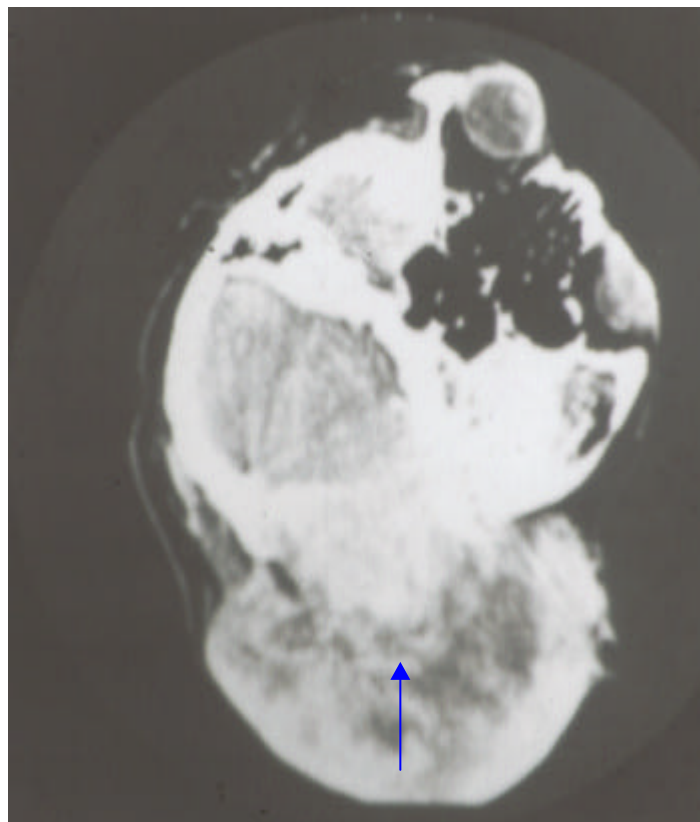


Fig 7B: Computed tomographic scan demonstrating large vascular metastases.

The surgical treatment of choice is total thyroidectomy – this should be done even in the presence of distant metastases. Total thyroidectomy is indicated since the treatment of actual, or metastatic, disease is the administration of radioactive iodine (^{131}I). Preferential uptake of ^{131}I is by thyroid tissue in the neck, hence the need for complete removal. Nodal metastases in the neck, or elsewhere, are of little or no consequence in patients with FC. Similarly, and in contrast to patients with papillary thyroid carcinoma, suppressive therapy (thyroxine) plays no oncological role in these patients, although thyroxine is required as replacement following total thyroidectomy.

ANSWERS:

1. Vascular, and not capsular, invasion is the histological feature that is required for the unequivocal diagnosis of follicular carcinoma of the thyroid gland.
2. Hematogenous and not lymphatic is the preferred route of metastatic spread of follicular thyroid carcinoma.

REFERENCES

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- Brennan MD, Bergstralh EJ, van Heerden JA, McConahey WM. Follicular thyroid cancer treated at the Mayo Clinic 1946 through 1970: Initial manifestations, pathologic findings, therapy, and outcome. *Mayo Clin Proc* 1991; 66:11-22.
- van Heerden JA, Hay ID, Goellner JR, Salomao D, Ebersold JR, Bergstralh EJ, Grant CS. Follicular thyroid carcinoma with capsular invasion alone: A nonthreatening malignancy. *Surgery* 1992; 112:1130-1138.

“It’s more important to know what sort of person this disease has,
than to know what sort of disease this person has.”

Sir William Osler