

ENT NEWS

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Quarterly Newsletter

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Thyroid Nodules

Nodules of the thyroid are much more likely to be benign than malignant. The approach to the evaluation of these nodules is, however, dictated by the need to identify those tumors which are malignant.

Patient Evaluation

Type of Thyroid Enlargement

Clinically, thyroid enlargement may be smooth and diffuse or nodular with the nodules being either single or multinodular. A smooth, diffuse enlargement is indicative of benign thyroid disease, although rarely anaplastic carcinoma or lymphoma may present this way. Consider these cancers if there are features of infiltration or metastasis.

A nodular goiter most commonly is multinodular (MNG), which usually represents the end stage of benign disease. The nodules consist of areas of colloid storage, degeneration, hyperplasia, cyst formation, and inflammation. Ten to 15% of multinodular goiters harbor a neoplasm. Of these, 90% are benign and 10% are malignant, with an overall incidence of malignancy in a MNG of 1 to 2 %.

A true single nodule is far more likely to be a neoplasm and carries a 5 to 10% chance of malignancy. Fortunately, 90% of these are well differentiated carcinomas, and as such, these patients have a very good prognosis with proper treatment.

Signs and Symptoms of Pressure on Adjacent Structures

An enlarged thyroid gland may cause pressure on adjacent structures such as the esophagus and trachea. As a result patients may complain of dysphagia or present with stridor. Retrosternal extension may cause trachea deviation and features of superior mediastinal syndrome with facial edema and venous engorgement of the neck.

Signs and Symptoms of Infiltration (Malignancy)

A mass that rapidly increase in size, particularly if associated with pain, is highly suggestive of malignancy. Infiltration of the strap muscles and skin may cause tethering which is apparent when the patient swallows. Invasion of the larynx or trachea will cause stridor or hemoptysis. Involvement of the recurrent laryngeal nerve will cause hoarseness. Other structures involved may include the cervical sympathetic chain, cranial nerves, brachial plexus, and great vessels.

Special Investigations

FNA

Fine-needle-aspiration biopsy is an integral part of the evaluation on the thyroid nodule for distinguishing benign from malignant tumors. The diagnostic accuracy is excellent for papillary, anaplastic, medullary, and overtly malignant follicular cancers. It is, however, of little value in diagnosing microinvasive follicular cancers, because capsule invasion (which is the diagnostic criterion) cannot be determined. A FNA should be performed on all nodules >1 cm and on those <1 cm if there is a history of radiation therapy to the head and neck, a family history of thyroid cancer, or the ultrasound is suspicious (nodules with micro calcifications, solid architecture, or a vascular periphery). Ultrasound guided FNA, as opposed to FNA by palpation alone, should be obtained if the nodule is deep and >50% cystic.

FNA specimen results are reported in one of four ways: inadequate, malignant, indeterminate, or benign. Patients with inadequate results will require a repeat FNA and close follow up. Malignancies are usually treated with surgery. Indeterminate results may require surgery depending on suspicion level for cancer. Patients with benign results need continued surveillance because the FNA false negative rate is 5%. A repeat ultrasound every 6 to 12 months is warranted, with a repeat FNA if the nodule grows by more than 20% in size.

Imaging

Ultrasound is the imaging modality of choice. It can be used for screening high risk individuals (family history or history of radiation exposure), differentiating MNG vs. single nodules, and characterizing the nodule (cystic vs solid). It also facilitates fine-needle-aspiration biopsy, monitoring for growth of nodules, and evaluating the cervical lymph nodes for metastasis.

A CXR may demonstrate retrosternal extension, tracheal deviation, superior mediastinal nodal involvement, and even pulmonary metastasis. CT scan and MRI are useful when evaluating for extrathyroidal spread and when more detail of the head, neck, and chest is warranted. Both of these modalities are usually unnecessary when dealing with a simple thyroid nodule.

Blood Tests

Thyroid function tests should be obtained to determine the endocrine status of the patient. Measurements of thyroid antibodies for Hashimoto's thyroiditis should be considered as well.

Thyroglobulin levels are often elevated with well-differentiated cancer and can be used to track response to therapy and monitor for recurrences

If medullary carcinoma is suspected a serum calcitonin level should be obtained.

Types of Thyroid Cancer

Well differentiated

Papillary Carcinoma
Follicular Carcinoma
Hurthle Cell Carcinoma

Medullary Carcinoma
Anaplastic Carcinoma
Lymphoma

Surgical Management

Depending on the FNA results, surgical management falls into two groups: those with confirmed malignancy preoperatively and those with indeterminate results.

Patients with malignant nodules should undergo a staging ultrasound of the neck to determine lymph node status. Those with enlarged lateral nodes suspicious for metastasis should be offered a functional neck dissection in addition to a total thyroidectomy. If there are enlarged lymph nodes in the central neck or if FNA indicates Papillary or Hurthle Cell Carcinoma with no overt lymph node disease, a central neck dissection with a total thyroidectomy should be offered to the patient.

Patients with indeterminate FNA results of an isolated, low risk nodule should be offered a hemithyroidectomy. If the mass is >4 cm, has marked atypia on FNA, suspicious lymphadenopathy, or if there is a positive family history for thyroid cancer or radiation therapy, then a total thyroidectomy should be done. Of those receiving a hemithyroidectomy, if the final pathology is malignant then a completion thyroidectomy is usually required.

Other treatments

Completion thyroidectomy is not only useful for removal of synchronous lesions and reducing the risk of recurrence but it also facilitates post-operative treatment with radioactive iodine where appropriate and permits long-term surveillance for disease recurrence with radioiodine whole-body scanning and monitoring of thyroglobulin levels.

Currently radioiodine ablation is recommended for patients with aggressive tumors, nodal disease, or those with primary masses >2 cm. With such treatment, multiple studies show a significant reduction in the rates of disease recurrence and mortality.

Radiation therapy and chemotherapy are reserved for disease refractory to surgical and radioiodine therapy and for anaplastic carcinoma.

Prognosis

In general, patients with well-differentiated cancer do extremely well with excellent long-term survival. In low-risk patients the mortality rate is 1 to 2%. High-risk patients (older age, males, large tumors, extrathyroidal extension) and those with unfavorable histology, medullary, or anaplastic carcinoma tend to do worse.

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