

## REVIEW ARTICLES

## CURRENT CONCEPTS

JANE F. DESFORGES, M.D., *Editor*

## MANAGEMENT OF A SOLITARY THYROID NODULE

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THE solitary thyroid nodule, defined as a palpably discrete swelling within an otherwise apparently normal gland, is usually a benign lesion. However, patient and physician alike are typically concerned about the possibility of thyroid cancer. This review describes a strategy for the treatment of clinically euthyroid patients who have a solitary thyroid nodule that prevents unnecessary testing while identifying the few patients who require therapy. Management has changed in recent years, but important differences of opinion remain over which nodules should be surgically excised. Several recent reviews address these issues comprehensively.<sup>1-3</sup>

## PREVALENCE OF THYROID NODULES AND CANCER

The frequency of thyroid nodules, about half of which are single on physical examination, increases throughout life (Fig. 1).<sup>4-8</sup> Single nodules are about four times more common in women than in men. After exposure to 2 to 5 Gy (200 to 500 rad) of ionizing radiation, particularly during infancy and childhood, new nodules develop at a rate of about 2 percent annually, reaching a peak incidence in 15 to 25 years.<sup>14</sup> Nodules are 10 times more frequent when the gland is examined at autopsy,<sup>9</sup> during surgery,<sup>10</sup> or by ultrasonography<sup>5</sup>; half the thyroids so studied have nodules, most of which are benign (Fig. 1).<sup>5,9-13</sup>

In the United States, only about 12,000 new thyroid cancers are diagnosed each year, and there are about 1000 deaths from the disease. Many more people have clinically silent thyroid cancers: up to 35 percent of thyroid glands removed at autopsy<sup>15</sup> or surgically<sup>16</sup> contain tiny (<1.0 cm), clinically unimportant papillary carcinomas.

## DIFFERENTIAL DIAGNOSIS OF THYROID NODULES

Any thyroid disease can appear as one or more thyroid nodules, but the differential diagnosis embraces chiefly the disorders shown in Table 1.<sup>1</sup> Of nodules removed surgically, an estimated 42 to 77 percent are

non-neoplastic colloid nodules, 15 to 40 percent are adenomas, and 8 to 17 percent are carcinomas.<sup>17-22</sup>

## Benign Nodules

## Colloid (Adenomatous) Nodules

For the most part, colloid (adenomatous) nodules are dominant nodules within glands that prove to be multinodular on radionuclide scanning, ultrasonography, or surgery. Most are hypofunctioning, as determined by radionuclide scanning, incompletely encapsulated, and sometimes poorly demarcated nodules that merge with the surrounding thyroid tissue,<sup>17</sup> but a few are hyperfunctioning. Cytologic studies usually reveal abundant colloid and benign follicular cells (Fig. 2A),<sup>17</sup> but hemorrhagic nodules or highly cellular aspirates may be difficult to differentiate from follicular tumors.

## Follicular Adenomas

Follicular adenomas, which are thought to be monoclonal tumors arising spontaneously from follicular epithelium, tend to be single lesions with well-developed fibrous capsules and a uniform histologic structure distinct from the normal surrounding thyroid.<sup>17</sup> They are classified according to the size or presence of follicles and the degree of cellularity (Table 1, Fig. 2B and 2C).<sup>17</sup> Simple colloid (macrofollicular) adenomas, the most common form,<sup>17</sup> closely resemble normal thyroid tissue. The others share architectural features with follicular carcinoma (Fig. 2D), a tumor most reliably identified by invasion of the capsule of the tumor or of vessels by malignant cells in biopsy

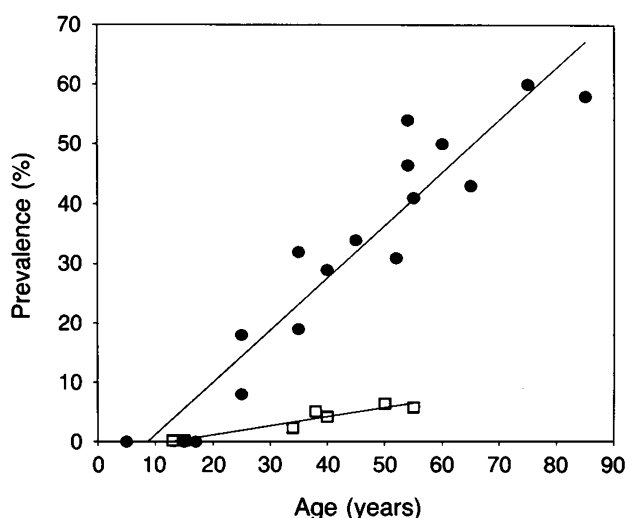


Figure 1. Prevalence of Palpable Thyroid Nodules Detected at Autopsy or by Ultrasonography (●) or by Palpation (□) in Subjects without Radiation Exposure or Known Thyroid Disease.

Data obtained by palpation are from Christensen et al.,<sup>4</sup> Brander et al.,<sup>5</sup> Rallison et al.,<sup>6</sup> Vander et al.,<sup>7</sup> and Trowbridge et al.,<sup>8</sup> and data obtained at autopsy and by ultrasonography are from Brandner et al.,<sup>5</sup> Mortensen et al.,<sup>9</sup> Lever et al.,<sup>10</sup> Brander et al.,<sup>11</sup> Horlocker et al.,<sup>12</sup> and Oertel and Klinck.<sup>13</sup>

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