ethanol and subsequently stained using a modified Papanicolaou technique. The adequacy of FNAB was the presence of 8-10 fragments of well-preserved follicular cells on at least two smears. The results of the FNA are classified by worst category for each patient, according to a 5-category scheme: THY1: inadequate or non-diagnostic; THY2: benign; THY3: indeterminate; THY4: suspicious lesion; THY5: malignant.

Study protocol

All charts were screened for previous history of thyroid abnormalities. Tc99m-pertechnetate thyroid scans and sonographic results were retrospectively evaluated. The review of records were focused on determining whether patients with an initially non-diagnostic FNAB were later established to have cancer.

All non-cancerous diagnoses (colloid nodule, nodular goiter, etc) were recorded as benign. When possible, FNAB cytological diagnosis was compared with subsequent histological diagnosis obtained from surgical specimens of partial or total thyroidectomy.

Results

Twenty-two (52%) of the 42 patients reported a positive family history of thyroid abnormality.

In this group, thyroid ultrasonography (US) enabled to detect 76% (n=32) of patients with solitary lesions, 7 of those with multiple lesions, and 7% (n=3) with cystic or mixed lesions. The average size of the aspirated nodules was 2.3 cm and ranged from 1.2 cm to 4.2 cm.Tc99m pertecnetat thyroid scintigraphy results were evaluated and 38/42 (90%) patients had solitary cold nodules.

Surgery was performed in 28 of 42 (66%) patients. Seven of 28 (25%) had a malignant lesion; 21out of them (75%) was benign. 3 of 7 patients were found to have papillary carcinoma of the thyroid. Four of 7 patients were found to have follicular carcinoma of the thyroid. The remaining 14 patients were followed up clinically and with US to detect any change in nodule size. No patient of this group showed any sign of malignancy during the 3-year follow up. The malignancy incidence in our patients with non-diagnostic FNA of thyroid gland was 16% (7/42).

Discussion

Clinically detectable thyroid nodules occur in approximately 4–10% of the population, but only 5–30% of those nodules are malignant (3,7,11). Cytologic interpretation of FNAB material allows categorization of specimens as benign, malignant, suggestive of neoplasia/malignancy, or unsatisfactory for interpretation (non-diagnostic). Although the sensitivity and specificity of thyroid FNAB is high, there remains a substantial proportion (ranging from 8% to 25%) of thyroid FNABs for which the findings rendered are unsatisfactory for diagnosis, representing a population of patients requiring further work-up of some variety (6,9). The topic of non-diagnostic FNAB and subsequent management has been addressed by McHenry et al. (9), who reviewed 92 patients who had thyroid surgery after repeatedly non-diagnostic FNAB. The 9% incidence of malignancy cited by them for patients with initial non-diagnostic FNAB. In the present study, non-diagnostic rate of 27% is high of other reported series (4,5,7,9-11).

Nodules detected by thyroid scintigraphy are classified as cold (hypo functioning), hot (hyper functioning) or indeterminate. Generally, 85% of thyroid nodules are cold, 10% are indeterminate and 5% are hot (10,12). We observed similar findings, 90% of solitary cold lesions.

US was primarily used to distinguish between cystic and solid thyroid lesions. US can confirm the presence of a lesion and define its characteristics better than manual palpation. Sonography has demonstrated that non-palpable thyroid nodules are 4 times more common than those, which are detected clinically (10). Unfortunately, US characteristics such as size, echogenicity, and the presence of a halo sign cannot truly differentiate between benign and malignant. In the present study 76% of patients had solid lesion, but only 18% of them (7/32) had subsequent malignant pathology.

Fine-needle aspiration biopsy is considered by most to be valuable in the evaluation of palpable thyroid nodules and is even proposed by many as the initial test that should be ordered. Because FNAB of the thyroid has a low complication rate, is available in the ambulatory setting, and is relatively inexpensive, it has become the initial test

in many patients with a thyroid nodule (5,6). Its major limitations include small percentages of interpretative errors, but the number of non-diagnostic aspirates is often significant. An inadequate biopsy specimen is an important cause of false negative results. Up to 20 percent of cytologic specimens obtained by FNAB contain too few cells for accurate interpretation. The rate of false negative cytologic results ranges from 1 to 6% and is chiefly due to sampling errors or misdiagnosis (7,13).

The topic of non-diagnostic FNAB and subsequent management has been addressed by McHenry et al., (9) who reviewed 92 patients who had thyroid surgery after repeatedly non-diagnostic FNAB. The 9% incidence of malignancy cited by them for patients with initial non-diagnostic FNAB. MacDonald and Yazdi (14) reported a 88% rate of benignity in thyroid glands resected after non-diagnostic FNAB. The malignancy rate is 11 in 91 patients or 12%. Our data include 7 cancer in 42 patients (16%).

In most cases with initially non-diagnostic fine needle aspiration biopsy of a thyroid nodule, malignancy is not found subsequently. 16% of our cases may still harbor malignancy. The FNA remains the first test in majority of cases for the evaluation of thyroid nodule., We concluded that clinical follow-up with surgical intervention is necessary in patients with non-diagnostic FNAB.

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