

**COMPARATIVE STUDY OF DIFFERENT IMAGING
TECHNIQUES USED IN THE DIAGNOSIS OF
THYROID DISEASES**

THESIS

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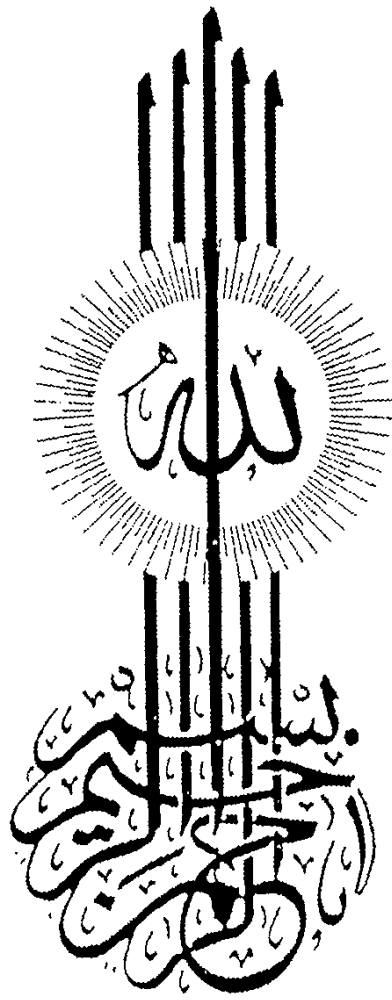
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TO MY MOTHER
MY BELOVED WIFE
AND OUR CHILDREN
For their love and support

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TABLE OF CONTENTS

	Page
1. Introduction and aim of work	1
2. Anatomy of the thyroid gland and histological consideration	4
3. Physiology of the thyroid gland	16
4. Pathology and clinical assessment of the thyroid gland	25
5. Materials and Methods	53
6. Results	67
Tables	79
Figures	98
7. Discussion	150
8. Summary and Conclusion	163
9. References	166
10. Arabic Summary	

LIST OF TABLES

	Page
Table 1: Characteristics of the studied sample (50) patients with various thyroid disorders.	79
Table 2: The laboratory and R.A.I.U. diagnosis of 37 patients from the total studied sample versus their functional diagnosis.	81
Table 3: Radionuclide, US and CT Findings in Thyroid Disease.	83

LIST OF FIGURES

	Page
Figure 1: Normal thyroid gland.	98
Figure 2: Recurrent multinodular goiter.	101
Figure 3: Multinodular goiter.	103
Figure 4: Multinodular goiter.	105
Figure 5: Multinodular goiter.	107
Figure 6: Recurrent multinodular goiter.	109
Figure 7: Intrathoracic goiter.	112
Figure 8: Solitary nodule.	114
Figure 9: Solitary nodule at right lobe	116
Figure 10: Solitary nodule.	118
Figure 11: solitary nodule.	120
Figure 12: Solitary thyroid nodule.	122
Figure 13: Diffuse simple goiter.	124
Figure 14: Diffuse toxic goiter.	126
Figure 15: Hypothyroidism.	128
Figure 16: Lymphocytic thyroiditis.	130
Figure 17: Riedel's thyroiditis.	132
Figure 18: Thyroid adenoma.	134
Figure 19: Thyroid carcinoma.	136

Figure 20:	Papillary carcinoma of the thyroid with L.N. metastases.	137
Figure 21:	Thyroid cysts.	139
Figure 22:	Thyroid cyst in the left lobe.	141
Figure 23:	Thyroid cyst in the right lobe.	144
Figure 24:	Thyroid cyst.	146
Figure 25:	Thyroid cyst.	148

***INTRODUCTION
AND
AIM OF WORK***

INTRODUCTION AND AIM OF WORK

The thyroid diseases present with a wide range of clinical findings ranging from classic symptoms and signs to various non specific manifestations.

In the assessment of thyroid disease, palpation of the gland, in combination with the patient's history and physical examination, are still the first step in thyroid diagnostics [**ReMine and Mc Conahey, 1977; Cerletty, et al., 1978**]. Yet there is a great deal dependent on personal skill and opinion hence fallacies could occur (**Ingbar, 1985**).

A variety of laboratory tests have been developed to assess thyroid functions and thyroid lesions. The fact that these tests are so many is in itself confusion, not to mention their availability in a developing country along with their lack of specificity and sensitivity (**Kaplan, 1989 and Ingbar, 1985**).

At times thyroid imaging is needed in order to complete the diagnosis. For several decades and yet still radionuclide studies have been used to assess the function of the thyroid gland and to study the nodular abnormalities (**O'Holleran, et al., 1982 and Heidental, et al., 1985**). They also provide information on substernally extending thyroid tissue (**Park, et al., 1987**). But bearing in our mind that scintigraphy has proved to be unsatisfactory in assessing the nature of the

hypofunctioning nodule (Solbiati, et al., 1985), their availability in a developing country and their cost effectiveness, limits their use for screening purposes of various thyroid disease.

Ultrasonography of the thyroid is a safe non-invasive modality with no radiation hazards (Simeone, et al., 1982) and readily available in developing countries. High frequency ultrasound is an effective means for assessing the internal morphology of the gland, detecting nodules and guiding aspiration biopsy (Rafto and Geftter, 1988). Also has provided additional information in differentiating cystic from solid thyroid nodules (Silverman, et al., 1984) and detecting multiple nonpalpable thyroid lesions (Katz, et al., 1984).

CT provided a complementary method for defining the morphology of thyroid gland and the anatomic extent of thyroid abnormalities in relation to the normal structures of the neck and mediastinum (Silverman, et al., 1984).

CT is also useful in determining the infiltration of thyroid masses into surrounding tissues (Higgins, et al., 1986). demonstrates regional L.N., also bone or cartilage involvement (Takashima, et al., 1988).

In this study, we aim to emphasize the role of different imaging modalities including radionuclide thyroid scintigraphy, US and CT in the diagnosis of thyroid lesions and the value of these modalities as a guidance to the management of different thyroid diseases.

**ANATOMY OF THE
THYROID GLAND
AND
HISTOLOGICAL
CONSIDERATION**

ANATOMY OF THE THYROID GLAND

The thyroid gland is a brownish-red, highly vascular organ, situated in the front and sides of the lower part of neck, opposite the fifth, sixth, seventh cervical and the first thoracic vertebrae. It is ensheathed by the pretracheal layer of the deep cervical fascia, and consists of right and left lobes connected across the median plane by a narrow portion, called the isthmus (**Warwick and Williams, 1989**).

Its weight is somewhat variable, but is usually 20 gm in an adult (**Halmi, 1986**). It is slightly heavier in the female, in whom it becomes enlarged during menstruation and pregnancy (**Warwick and Williams, 1989**).

The thyroid gland is convex anteriorly and concave posteriorly as a result of its relation to the anterolateral portions of the trachea and larynx, around which it is wrapped and to which it is firmly fixed by fibrous tissue. The thyroid gland is enveloped by a thickened fibrous capsule which sends septa into the gland substance to produce an irregular and incomplete pseudolobulation. No true lobulation exists (**Kaplan, 1989**).

Normal variations in shape, size, position and configuration of the thyroid are numerous (**Volpe, 1989**).