ROLE OF VARIOUS RADIONUCLIDE AGENTS IN THE DIAGNOSIS AND FOLLOW UP OF PATIENTS WITH THYROID CARCINOMA

Essay

Submitted in partial fulfillment of

the Master Degree in Radiodiagnosis

By

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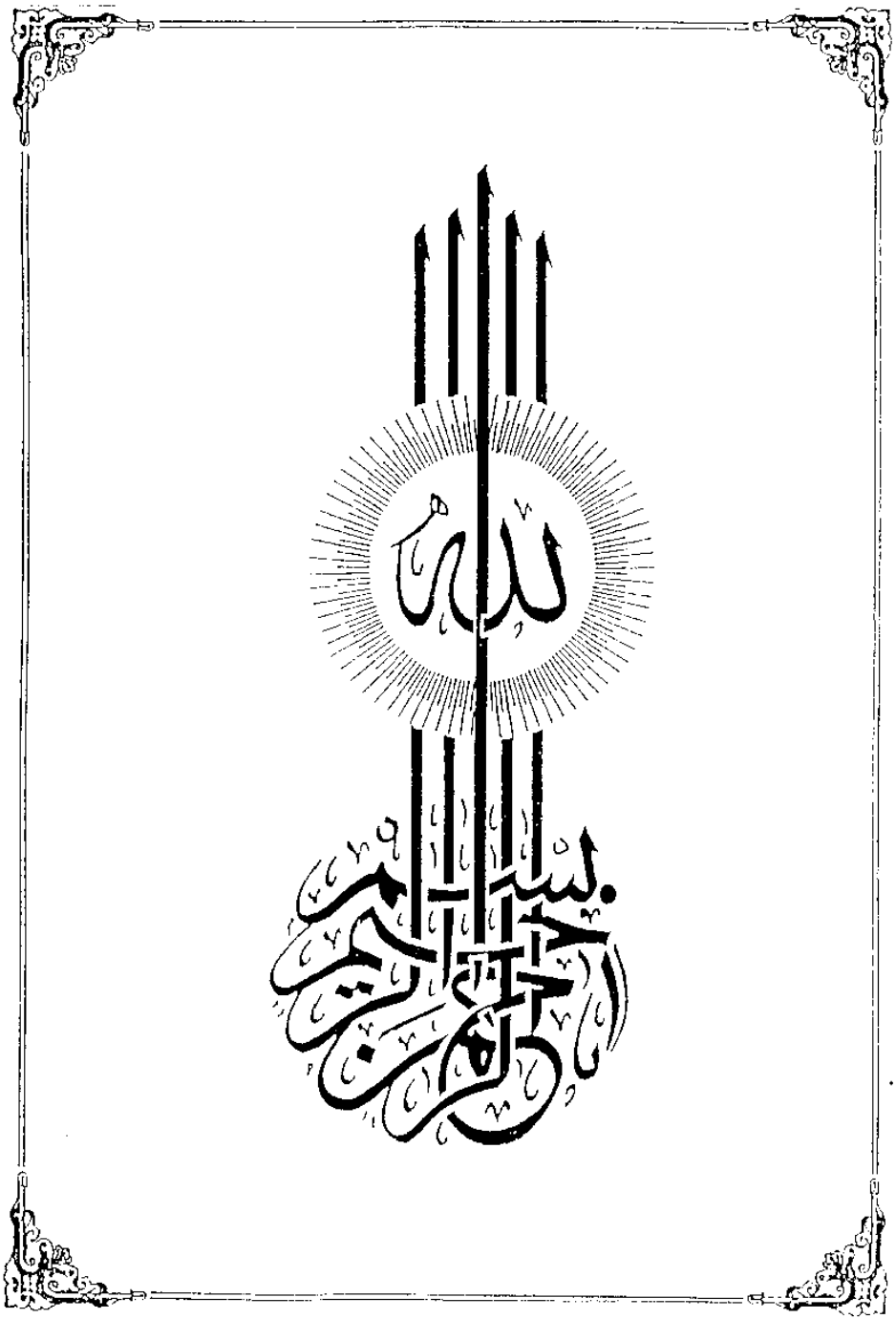
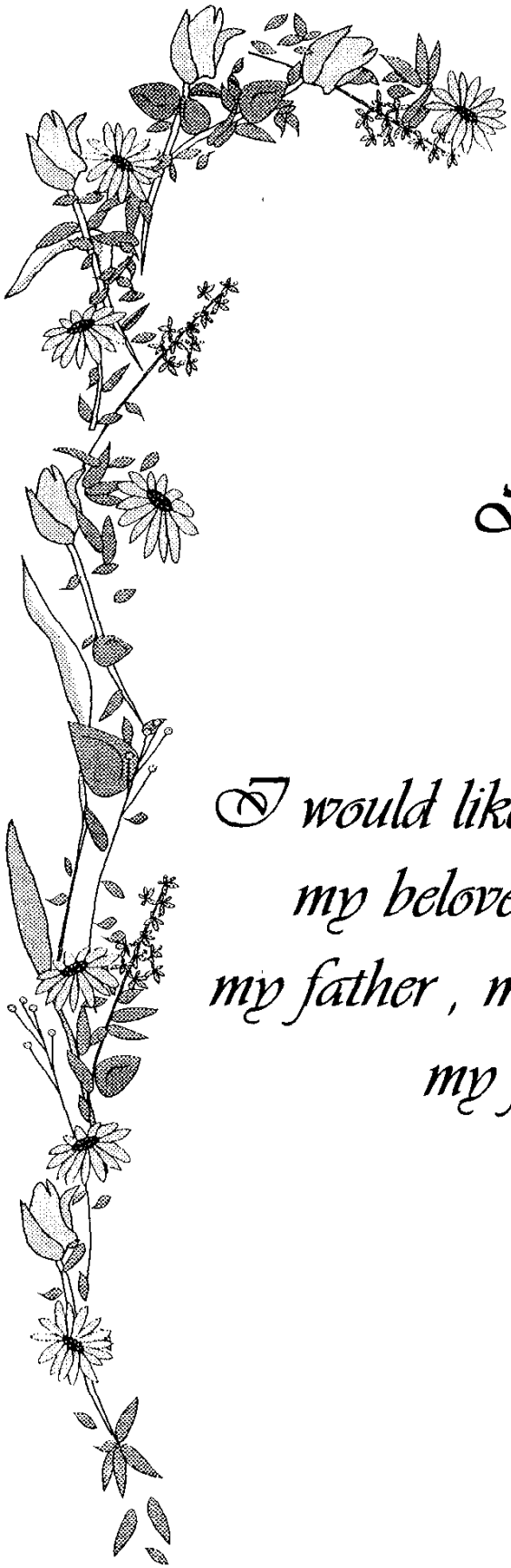
بسم الله الرحمن الرحيم

رب هب لي حكما و
الحقني بالصالحين (٨٣)
و اجعل لي لسان صدق
في الآخرين (٨٤)

صدق الله العظيم

سورة الشعراء





Dedication

I would like to dedicate this study to my beloved family especially my father , my mather , my sister and my fiancee Abeer .

Acknowledgment

I would like to express my deepest appreciation to Prof. Dr. Ahmed Talaat Khiry , Assistant professor of Radiodiagnosis , Ain Shams University , for suggesting this subject , his kind patience , detailed supervision and his continuous encouragement . He spent a lot of time and did much effort revising every word in this essay . His intellectual and constructive opinions were essential to dress this work its final form .

I gratefully acknowledge all those who have helped me and shared in achieving this work .

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INTRODUCTION AND AIM OF THE WORK

Thyroid imaging studies were the first to be widely used in nuclear medicine and the availability and number of types and studies have increased markedly over the past three decades.

Thyroid scintigraphy is helpful for virtually all anatomic and physiologic disorders of the thyroid gland.

Some of the more common uses are :

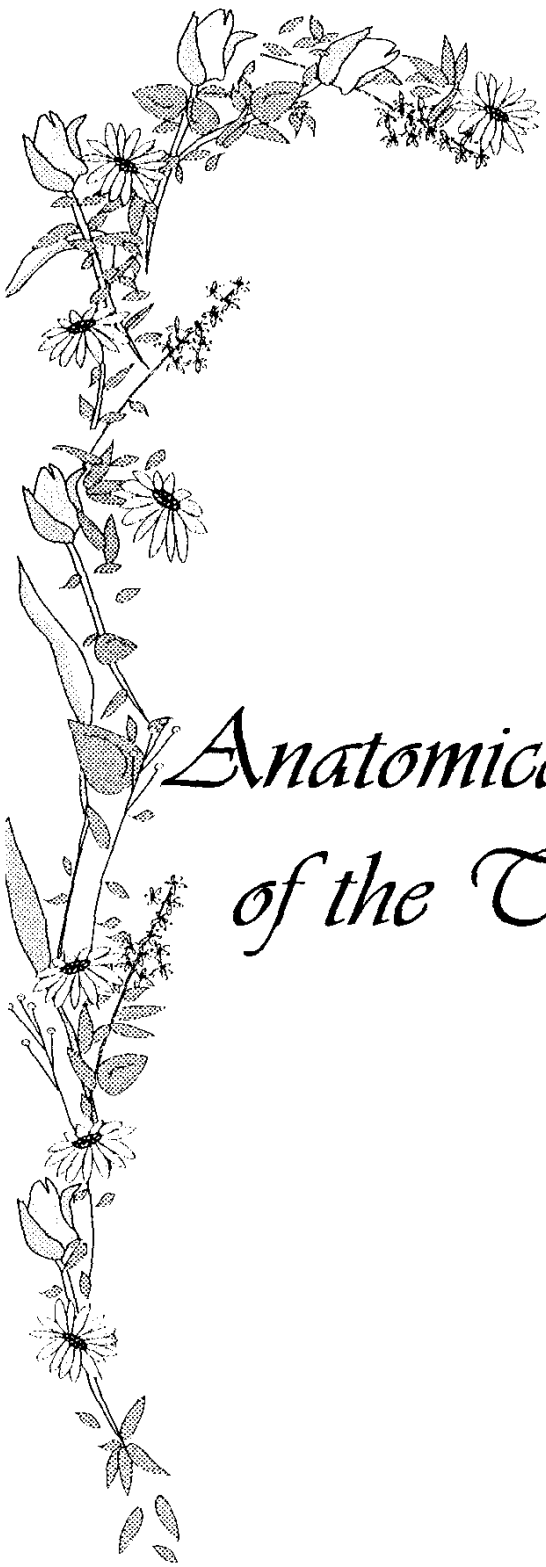
(1) Determination of thyroid size.
(2) Evaluation of thyroid enlargement.
(3) Detection of thyroid carcinoma.
(4) Detection and evaluation of thyroid nodules.
(5) Determination of cause of hyperthyroidism.
(6) Determination of cause of hypothyroidism.
(7) Location of ectopic or aberrent thyroid tissue.
(8) Suspicion of unilateral subacute or acute thyroiditis.
(9) Postoperative evaluation of the thyroid gland.

Thyroid scintigraphy is one of the simplest, least expensive and potentially most efficacious nuclear imaging procedures availability. However, it is important to know what the scan can and can not do in terms of providing useful information in the patient with suspected thyroid disease.

The presence of a palpable nodule in the thyroid gland is a major indication for performing thyroid scintigraphy. Not infrequently, a "single" palpable nodule on the scan will prove to be in reality one of many such "cold" or "hot" areas in an enlarged gland. This finding often influences mangment toward medical rather than surgical therapy of the lesion(s). The relative radioisotope uptake of the nodule, as well as the presence of other areas of the etiology of the nodule and the advisability of operative removal.

Thyroid imaging can be performed with a number of different radiopharmaceuticals and imaging instruments. There is no imaging ideal method since each technique has its own advantages and disadvantages.

This study discusses the various radiopharmaceuticals that can be employed to establish the diagnosis and follow up of patients with thyroid carcinoma.



Anatomical Considerations of the Thyroid Gland

ANATOMICAL CONSIDERATIONS OF THE THYROID GLAND

The Thyroid Gland, brownish-red and highly vascular, is placed anteriorly in the lower neck, level with fifth cervical to the first thoracic vertebrae. Ensheathed by the pretracheal layer of deep cervical fascia, it has right and left lobes connected by a narrow, median isthmus. Its weight is usually about 25 grams but varies, being slightly heavier in females, and enlarging during menstruation and pregnancy (Gray, 1992).

Thyroid lobes :

They are approximately conical; their ascending apices diverge laterally to the level of the oblique lines on the laminae of the thyroid cartilages; their bases are level with the fourth or fifth tracheal cartilages. Each lobe is about 5 cm long, its greatest transverse and antroposterior extents being about 3 cm and 2 cm respectively. Its postromedial aspect is attached to the side of the cricoid cartilage by a lateral thyroid ligament.

The lateral (superficial) surface is convex and covered by ***Sternothyroid***, whose attachment to the oblique thyroid line prevents the upper pole of the gland from extending onto the ***Thyrohyoid*** muscle. More anteriorly there are the ***sternohyoid*** and ***superior belly of omohyoid***, overlapped inferiorly by the anterior border of ***sternocleidomastoid*** muscle.

The medial surface is adapted to the laryx and trachea, contacting at its superior pole the ***inferior pharyngeal constrictor*** and the posterior part of the ***cricothyroid*** muscles, which separate it from the posterior part of the thyroid lamina and the side of the cricoid cartilage.