INTRODUCTION

The thyroid gland is unique among all of the endocrine glands being the largest one and having a superficial location accordingly, it is easy to be physically examined and to take a biopsy **(Moore, 1988**).

The main function of the thyroid gland is production of thyroid hormones which are responsible for body growth, central nervous system maturation, bone development and regulation of metabolism **(Ingbar, 1985).**

Diseases of the thyroid including developmental, inflammatory, hyperplastic and neoplastic disorders **(Kashgari, 1999)**

In general population, the prevalence of nodular thyroid disorder has been reported to be 1.5 to 6.4% **(Lowson *and* Biller, 1983)**

Most of those thyroid nodules are benign lesions, and there is a 5 to 10% chance of malignancy in all thyroid nodules **(Mazzaferri,1992).**

Thyroid cancer is the most common type of endocrine malignancy and accounts for the most of deaths due to endocrine cancers **(Robbins et al.,1992).**

However males, extreme aged patients with history of

childhood neck irradiation are at a higher risk for malignancy. Also the presence of solitary nodule or dominant nodule in a multinodular goiter, serious investigation should be done to exclude carcinoma **(Schneidert al.,1985)**

To differentiate malignant from benign lesions and to avoid unnecessary surgery, thyroid scan; ultrasonography and fine-needle aspiration cytology (FNAC) are used as diagnostic tool **(Mazzaferri, 1993).**

Thyroid function tests should be performed to identify the underlying thyroid pathology and not to differentiate benign from malignant nodules **(Pacini et al., 1994).**

Ullrasonography is considered the first choice in evaluation of morphology of the gland, It demonstrates the internal structure of the enlarged gland, determines size and number of nodules differentiate solid from cystic lesions and detects areas of degeneration and local calcification. Moreover, it has the value of finding the relation between an enlarged gland and the surrounding structures **(Mettler et al., 1992).**

Malignant sonographic characteristics that suggest malignancy are: microcalcification, an irregular or microlobulated margin marked hypoechogenicity and a shape that was more tall than it was wide. **(Eun-Kyung Kim et al. 2002)**

Fine needle aspiration biopsy (FNAB) is considered a reliable test for the diagnosis of malignant thyroid nodule. In nonpalpable thyroid

nodules, ultrasonography has become a main tool for FNAB guidance, moreover, ultrasonography is the most effective method to provide information about location, number, size, and echogenicity of thyroid nodules. **(Laurance Leenhardet, et al 1999)**.

In fact US-guided FNAB is an invasive procedure and is subject to sampling errors . Approximately 15 to 20 percent of nodules yield an inadequate or non diagnostic cytology (**Chow LS, et al 2001)**

Reliable criteria for determining which nodules should be aspirated are needed .Although palpation is the oldest and most frequently used screening method for detecting thyroid nodules correlates with malignancy, it is subjective and depends on the skills of the examiner **(Cooper DS, et al 2006).**

US elastography is a newly developed dynamic technique that evaluates the degree of distortion of a tissue under the application of an external force. the softer parts of the tissue deform more than the stiffer parts. The softer parts of the tissue are colored red, the stiffer parts are colored blue and the parts of intermediate elasticity are colored green. this technique enables evaluation of tissue stiffness from the deformation rate **(Ophir J,et al.1991).**

US elastography is non stressful for patients, easy to perform, and requires not more than a few minutes of additional examination time and is a very useful examination to avoid unnecessary procedures**. (Ryoji Kagoya ,et al 2010)**