

<u>Ultrasound in Thyroid Nodules</u>

Ultrasound Modalities in the Detection of Benign and Malignant Thyroid Nodules Literary Review

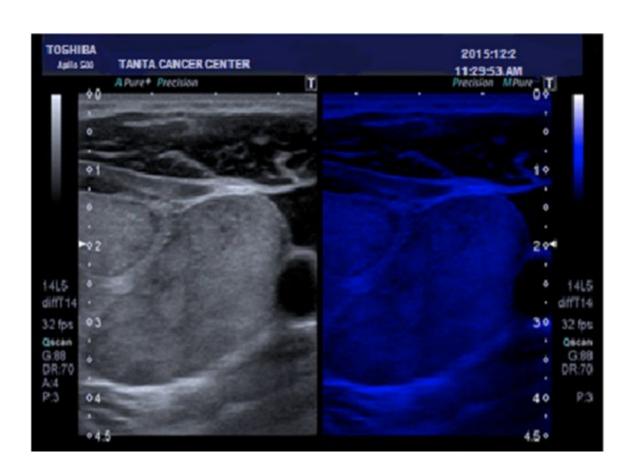
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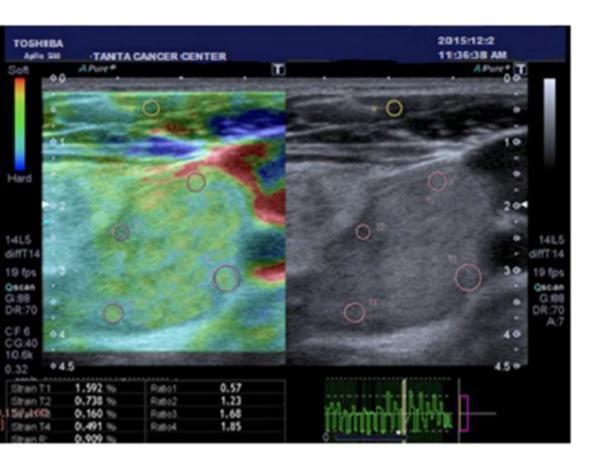
Introduction

Thyroid nodules are common in adults, and the prevalence of thyroid cancer has been increasing. It can be challenging to distinguish between benign and malignant thyroid nodules. Ultrasound is a non-invasive and straightforward imaging technique that is an excellent initial diagnostic tool for assessing thyroid nodules Different ultrasound methods are used to detect thyroid nodules, each with its own benefits and drawbacks.

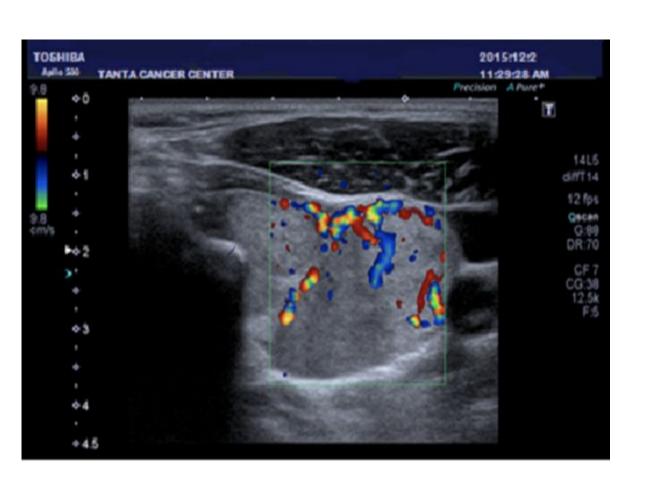
Examples of Types of Modalities



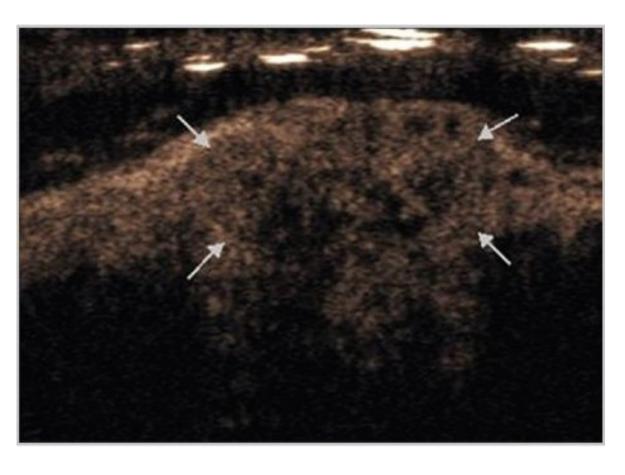
Left Image: Normal Ultrasound
Right Image: Micropure Imaging
Modality



Left Image: Elastography



Color Doppler



Contrast Enhanced

Background

Elastography

Monitor Tissue Stiffness – detect mechanical changes

High accuracy in differentiating benign and malignant

Assess various tissue types

Micropure

Microcalcifications of thyroid nodule – white spots

Contrast Enhanced

Vascular perfusion and hemodynamics in nodules

Eval microvascularization for neoplastic growth

Can be applied to kidneys, prostate, breasts, testes

Grayscale

5 types of echo intensity to detect and differentiate

Effective detecting malignant with low or extremely low echo

Longitudinal, transverse, oblique section

Color-Doppler

Identify nodules with abnormal vascularization

- 4 Categorization Types
- Type 1 Absence
- Type 2 perinodular only
- Type 3 mild intramodular
- Type 4 marked intranodular

Methods

- The data was collected from a compilation of systematic reviews published on pubmed.
- To refine the results, an advanced search featuring "thyroid ultrasound detection" with systematic review selected as the sole article type and a publication date limit of the past ten years.
- This yielded a total of 55 systematic reviews.
- From there, search terms such as "thyroid nodules," "ultrasound," and "detection" were employed, reducing the number to 20.
- These were analyzed to evaluate various ultrasound modalities

Going Forward

Each modality serves a specific purpose in diagnosing thyroid nodules as benign or malignant, and numerous studies have been conducted to compare these modalities.

One characteristic not discussed in these studies was the timing between the development of the nodules and when ultrasound scans were performed. While many of these studies were conducted over months or years, only one scan was performed on each patient, followed by fine needle aspiration for definitive diagnosis, without providing information on the progression of the disease.

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References



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