

# The Diagnostic Value of Ultrasound Combined with Serum VEGF and TSGF Levels Detection for Differentiated Thyroid Cancer

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**Abstract: Objective:** To explore the diagnostic value of ultrasound combined with serum VEGF (vascular endothelial growth factor) and TSGF (tumor specific growth factor test) levels in differentiated thyroid cancer, and analyze clinical and pathological characteristics. **Methods:** Multiple patients with differentiated thyroid cancer who received diagnosis and treatment in a certain hospital in China from February 2021 to February 2023 were selected for the experiment. 50 patients were randomly selected as the experimental group. Based on the type of adenocarcinoma, these 50 patients were further divided into the thyroid follicular carcinoma group and the thyroid papillary carcinoma group. Fifty patients with thyroid sarcoidosis were selected as the control group during the same period. Compare the ultrasound examination results and serum levels of VEGF and TSGF between two experimental groups to explore their relationship with the clinical and pathological characteristics of differentiated thyroid cancer. **Results:** Through experimental observation, it can be concluded that the sensitivity of ultrasound combined with serum VEGF and TSGF levels in the diagnosis of differentiated thyroid cancer is relatively high, and it will significantly exceed the diagnostic sensitivity of ultrasound alone, with  $P < 0.05$ . And the combination of ultrasound and serum VEGF, TSGF level detection will exceed the specificity and positive predictive value of ultrasound detection in both positive predictive value and specificity. **Conclusion:** Ultrasound combined with serum VEGF and TSGF levels detection has a relatively high diagnostic value for differentiated thyroid cancer, and can determine the correlation between tumor invasion and metastasis in patients with differentiated thyroid cancer and their serum VEGF and TSGF levels.

**Keywords:** Ultrasonic testing; Serum VEGF; TSGF level; Differentiated thyroid cancer; Diagnostic value

## Introduction

Thyroid cancer is a serious malignant tumor disease in clinical medicine in China. In clinical practice, it will be further divided into differentiated and undifferentiated thyroid cancer based on actual histological characteristics. According to relevant survey reports, over 90% of thyroid cancer patients are diagnosed with differentiated thyroid cancer. The degree of deterioration of this disease will be relatively low, and patients will have a better prognosis and recovery effect after surgical treatment. In the process of diagnosing differentiated thyroid cancer, ultrasound examination is usually used. This detection method has a relatively high diagnostic rate and does not generate radiation. However, if ultrasound testing is used alone during the examination process, it is easy to miss or misdiagnose. Vascular endothelial growth factor is a type of pro angiogenic factor that can promote the formation of neovascular tumor specific growth factors and participate in the formation process of vascular network and vascular proliferation. And according to relevant investigation reports, it is understood that serum VEGF and TSGF levels will play a certain role in the occurrence and development of thyroid diseases. To use effective detection methods to determine the patient's serum condition, in order to effectively predict the patient's prognosis and improve the accuracy of thyroid cancer diagnosis, the following is a report.

## 1. Experimental data and methods

### 1.1 Experimental data

In order to deeply explore the diagnostic value of ultrasound combined with serum VEGF and TSGF level detection for differentiated thyroid cancer, this study conducted experiments on multiple differentiated thyroid cancer patients admitted to a hospital in China from February 2021 to February 2023. Randomly select 50 patients and assign them to the experimental group. Afterwards, collect 50 patients with thyroid sarcoidosis during the same period and place them in the control group. Among them, patients in the experimental group should be divided into thyroid follicular carcinoma group and thyroid papillary carcinoma group according to the type of pancreatic cancer. There are 11

female patients and 14 male patients in the papillary thyroid carcinoma group. The minimum age is 41 years old, the maximum age is 55 years old, and the overall average age is 47 years old. There are 10 female patients and 15 male patients in the thyroid follicular carcinoma group. The minimum age is 40 years old, the maximum age is 56 years old, and the overall average age is 47 years old. There are 25 female and 25 male patients in the control group. The minimum age is 41 years old, the maximum age is 55 years old, and the overall average age is 47 years old. There was no statistically significant difference in the general information comparison of patients, with  $P>0.05$ .

Reasonably set inclusion and exclusion criteria. The inclusion criteria include all patients using color Doppler ultrasound technology for detection, patients meeting the corresponding diagnostic criteria for diseases such as thyroid nodules and papillary thyroid cancer, age not less than 18 years old, complete relevant information, and all signing the experimental notification letter.

## 1.2 Experimental methods

During the detection process, color Doppler ultrasound diagnostic equipment should be used to control the probe frequency between 5 and 18MHz. The patient should be in a supine position with the neck exposed. A comprehensive and multi section scanning method should be adopted to carefully observe the characteristics of the patient's thyroid lesions and grasp the condition of the lesions. Understand the characteristics of the posterior echo, and it is also necessary to observe whether there is lymph node enlargement around the thyroid gland.

In the morning, 5ml of venous blood was extracted from the lower elbow of the patient on an empty stomach, centrifuged at a rate of 10 cm for 10 minutes at a rate of 3500r/min to obtain serum. Enzyme linked immunosorbent assay was used for experimental detection.

## 2. Results

### 2.1 Comparative analysis of serum VEGF and TSGF levels detected by ultrasound combined with two groups

The experimental group and the control group were compared in terms of lesion boundary, morphology, internal structure, echo, calcification, thyroid lymph node enlargement, serum VEGF and TSGF levels, with  $P<0.05$ . The two groups were compared in terms of blood flow, with  $P>0.05$ . As shown in Table 1.

**Table 1. Comparative analysis of the results of ultrasound and serum VEGF and TSGF level in two groups**

project	Control group	experimental group	t/ $X^2$	P
	N=50	N=50		
Lesion boundary			38.500	0.000
clear	40	15		
Unclear	10	35		
form			17.400	0.000
Horizontal to vertical ratio<1	35	20		
Horizontal to vertical ratio>1	15	30		
internal structure			21.932	0.000
Cystic	32	10		
Solidity	18	40		
echo			33.644	0.000
Low echo	25	42		
Non low echo	25	8		
calcification			7.382	0.007
No or coarse calcification	38	26		
Microcalcification	12	24		
blood flow			1.839	0.175
None or dotted bar shape	24	32		
rich	26	18		
Enlargement of lymph nodes around the thyroid gland			84.324	0.000
yes	50	15		
no	0	35		
Serum VEGF ( $\bar{x} \pm s$ , pg/ml)	15.66±5.42	26.33±7.07	9.532	0.000
Serum TSGF ( $\bar{x} \pm s$ , pg/ml)	49.66±9.82	72.41±11.52	12.007	0.000

## 2.2 The diagnostic value of ultrasound combined with serum VEGF and TSGF levels in differentiated thyroid cancer

The sensitivity of ultrasound combined with serum VEGF and TSGF levels detection was significantly higher than that of ultrasound examination, with  $P < 0.05$ . The two diagnostic methods were compared in terms of specificity, positive predictive value, and negative predictive value, with  $P > 0.05$ . However, the specificity, positive predictive value, and negative predictive value of ultrasound combined with serum VEGF and TSGF levels detection were slightly higher than those of ultrasound examination.

## 3. Discussion

Ultrasound examination is prone to misdiagnosis, and the main reason for this is due to the non-specific nature of small lesions and multiple nodules. The levels of serum VEGF and TSGF can be used to evaluate the progression of differentiated thyroid cancer, making up for the shortcomings of ultrasound examination. Therefore, combined examination has higher diagnostic value. Therefore, in clinical practice, diseases can be diagnosed through ultrasound combined with laboratory related indicators, providing reference for the development of clinical treatment plans.

## 4. Conclusion

In summary, patients with differentiated thyroid cancer may have abnormal levels of serum VEGF and TSGF. Adopting ultrasound combined with serum VEGF and TSGF detection can effectively improve the diagnostic accuracy of differentiated thyroid cancer.

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