

# Analysis of Diagnostic Effect of Nuclear Medicine and Ultrasonic Examination on Subacute Thyroiditis

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**Abstract:** Objective: To compare and analyze the diagnostic effect of nuclear medicine and ultrasound on subacute thyroiditis. Methods: 60 patients with subacute thyroiditis who underwent nuclear medicine and ultrasound examination in a hospital in our city from 2019 to 2021 were studied, including 33 women and 27 men, with an average age of  $38.7 \pm 8.9$  years and an average course of  $46.2 \pm 16.8$  days. These patients were diagnosed by nuclear medicine and ultrasound examination respectively, and the two diagnostic results were compared by chi square test. Results: the positive rate of nuclear medicine in the diagnosis of subacute thyroiditis was 91.67% (57/60), and the positive rate of ultrasound in the diagnosis of subacute thyroiditis was 96.66% (58/60). There was no significant difference between the two ( $P > 0.05$ ). Conclusion: the diagnosis of subacute thyroiditis by nuclear medicine and ultrasound has a good accuracy. When making specific clinical diagnosis, we should choose the appropriate diagnostic method according to the actual situation of patients.

**Keywords:** Nuclear Medicine; Ultrasonic Examination; Thyroiditis; Diagnostic Effect

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## Introduction

Sub thyroiditis is an immune disease of human body, which can be divided into sub acute granulomatous thyroiditis, non infectious thyroiditis, viral thyroiditis, etc. the main symptoms can be manifested as fever, thyroid pain, cervical lymph node enlargement, etc. the course of this kind of disease is relatively long, and many patients will heal themselves, but another part of patients will have thyroid function decline, and serious cases will have permanent hypothyroidism, This will be directly related to the health of patients, so we must timely and accurate treatment of subacute thyroiditis. Many scholars believe that it is viral infection that causes subacute thyroiditis, and there will also be genetic factors. The causes of subacute thyroiditis are relatively complex, and students are prone to misdiagnosis or missed diagnosis, and this kind of disease has a high recurrence rate, which will directly affect the physical and mental health of patients. In clinical medicine, ultrasonic examination and hormone function detection are usually used. The operation of ultrasonic examination is relatively simple, has strong sensitivity, belongs to non-invasive examination, and has a good application in clinic. With the continuous development of nuclear medicine and the continuous promotion of the application of nuclear medicine, this article will compare and analyze the clinical data of 60 patients with subacute thyroiditis in a hospital.

## 1. Materials and methods

### 1.1 General materials

60 patients with subacute thyroiditis who underwent nuclear medicine and ultrasound examination in a hospital from 2019 to 2021 were taken as the research objects. The patients were 25-69 years old, with an average age of  $38.7 \pm 8.9$  years, including 33 women and 27 men. The course of disease was 14-60 days, with an average course of  $46.2 \pm 16.8$  days, including 14 patients with diffuse goiter of the thyroid gland and 13 patients with nodular goiter of the thyroid gland, which would be accompanied by fever, fatigue Symptoms of throat pain, including 52 cases of bilateral thyroid involvement, 8 cases of left involvement, 9 cases of right involvement. These 60 patients have been excluded from patients with liver and kidney dysfunction and patients with mental disorders.<sup>[1]</sup>

## **1.2 Method**

We should have a detailed understanding of the specific condition and history of these 60 patients with subacute thyroiditis, conduct a detailed physical examination of the patients, make a diagnosis, fully understand the taboos of the patients, strictly keep the patient's condition and privacy confidential, and use nuclear medicine and ultrasound examination for these 60 patients.

### **1.2.1 Ultrasonic examination**

The ultrasonic examination instrument used is the Doppler ultrasonic diagnostic instrument, and the probe frequency is set to 7.5mhz-10mhz. The patient should be in a supine position during the examination, and the thyroid parts should be scanned and tested in different sections and angles. The size, shape, internal echo and focus of the patient's thyroid should be observed, and the scanning content should be recorded. The blood flow of the thyroid should be examined, and finally the ultrasonic image should be formed.

### **1.2.2 Nuclear medical examination**

The serum free thyroxine, free triiodothyronine and thyroid stimulating hormone levels of patients were analyzed by placing 125 iodine and using ge-911 radioimmunoassay counter. Mn-6110 thyroid function instrument was used to determine the 24-hour iodine uptake rate of patients, and Siemens T2 SPECT instrument was used to perform plane imaging of thyroid gland. Using high-quality radionuclide testing agents, patients should be prohibited from taking drugs and iodine containing food that affect thyroid function 14 days before testing.<sup>[2]</sup>

## **1.3 Evaluation index**

### **1.3.1 Ultrasonic diagnostic indicators**

After examination, the thyroid gland appeared symmetrical or locally enlarged, the cell membrane thickened, the echo inside the gland showed a uniform and sparse hypoechoic area, and abundant blood flow appeared in the hypoechoic area and the edge of the gland. A reasonable analysis was made according to the specific sonograms of these 60 patients.

### **1.3.2 Judgment standard of nuclear medicine**

After examination, it was determined that the level of thyroid hormone increased and the intake of 131 iodine decreased, and the two showed a separation phenomenon; Thyroid imaging showed diffuse, localized imaging, imaging agent defect, sparse, 99m Tc uptake rate decreased.<sup>[3]</sup>

## **1.4 Statistical treatment**

The positive rate of these 60 patients with subacute thyroiditis was compared, and spss20.0 statistical software was used to process it. Nuclear medicine examination and ultrasound examination were used to test the difference in the positive rate of subacute thyroiditis diagnosis,  $P < 0.05$ , the difference was statistically significant.

## **2. Results**

Among these 60 patients, 57 cases were diagnosed as positive by nuclear medicine examination, with a positive rate of 91.67% (57/60). 58 cases were diagnosed as positive by ultrasound examination, with a positive rate of 96.66% (58/60). There were 17 cases of unilateral lesions and 52 cases of bilateral thyroid lesions. There was no significant difference between the two,  $P > 0.05$ , with no statistical difference. Among them, 3 patients with positive ultrasound but negative nuclear medicine were in the middle stage of subacute thyroiditis, and 1 patient misdiagnosed by ultrasound and nuclear medicine was in the recovery stage.

### 3. Discussion

From a medical point of view, subacute thyroiditis is a multiple disease. Its incidence group is about 30-60 years old, and there are many women. The clinical manifestations of subacute thyroiditis are relatively complex and diverse. Because its clinical manifestations and symptoms are relatively variable, complex and diverse, it often leads to missed diagnosis and misdiagnosis in the process of clinical diagnosis of subacute thyroiditis. Nuclear medicine examination can detect a variety of index hormones related to thyroid follicle function. If the thyroid follicles of patients with subacute thyroiditis are damaged due to inflammation, the levels of free thyroxine and triiodothyronine in the blood will be significantly increased, resulting in the reduction of thyroid hormone level, the ability of thyroid gland to absorb iodine will be reduced, and the iodine uptake rate will be reduced, The uptake rate of 99m technetium decreased. Thyroid imaging will cause the distribution defect, sparsity and dilution of imaging agents, resulting in hypothyroidism of patients. The cost of ultrasonic diagnosis is relatively low. It belongs to non-invasive operation, and the operation process is relatively simple and convenient. At present, it is an important way to diagnose subacute thyroiditis in medicine in China, which is based on the echo characteristics of thyroid gland. According to the specific situation of color ultrasound images, it can be divided into three stages: acute stage, middle stage and recovery stage. [4] Patients with acute stage of subacute thyroiditis will have obvious pain in the thyroid gland, some patients will have fever symptoms, thyroid follicles will be destroyed, the focus will have inflammation, congestion symptoms around the gland body will appear, hormone levels will significantly increase, and thyroid iodine uptake function will be significantly reduced, At this stage, ultrasonic examination and nuclear medicine examination will show typical symptoms of subacute thyroiditis, and there will be no Misdiagnosis; In the middle stage, the inflammatory reaction was reduced, the ultrasound showed that the focus was significantly narrowed, the boundary was blurred, there was still a small amount of blood flow signals around the focus, the hormone level gradually decreased, or even decreased, and the iodine uptake function gradually recovered. At this stage, the pain of patients was reduced, the clinical symptoms and nuclear medicine examination indicators of some patients were not typical, and the separation between hormone level and iodine uptake function was not clear, In this group, 3 patients with positive ultrasound and negative nuclear medicine were in this stage, so the accuracy of ultrasound was higher than that of nuclear medicine; During the recovery period, the inflammation gradually disappeared, the parenchymal lesion necrosis with punctate calcification, ultrasound showed that the lesion changed from a low echo area to a high echo light spot, the abnormal blood flow signal disappeared, the patient's pain disappeared, and the hormone level and iodine uptake function basically returned to normal. At this time, ultrasound is often confused with thyroid nodules, and nuclear medicine examination tends to be normal. Dynamic analysis should be carried out in combination with history and previous clinical outcomes. The timing of diagnosis and treatment varies with the time of seeing a doctor. Due to the differences in individual tolerance of patients, the clinical manifestations are very complex. It is easy to cause misdiagnosis and missed diagnosis only through nuclear medicine and iodine uptake rate testing. In particular, iodine uptake rate is affected by many factors. Special preparations should be made for testing, which is prone to false positives and takes a long time. Therefore, for the symptoms of suspected thyroiditis, ultrasonic examination should be carried out at the same time as nuclear medical examination.[5]

### 4. Conclusion

Through the diagnosis and analysis of the condition of 60 patients with subacute thyroiditis in our hospital, the positive rate of nuclear medicine for the diagnosis of subacute thyroiditis was 91.67%, and the positive rate of ultrasound for the diagnosis of subacute thyroiditis was 96.66%. There was no significant difference between the two,  $P > 0.05$ , which was not statistically significant. It can be seen that the diagnostic rate of nuclear medicine and ultrasonic examination is relatively accurate and high in the diagnosis of subacute thyroiditis, and ultrasonic examination will have better advantages. Because nuclear medicine testing reagents have radioactive factors and need to invest a high cost, ultrasonic examination is worthy of extensive promotion and application in the examination and diagnosis of subacute thyroiditis. If the patient's subacute thyroiditis can't be judged in the middle and recovery period, nuclear medicine examination and ultrasonic examination can be used, which will have a better diagnostic effect. In the specific diagnosis process, we should choose the diagnosis method

according to the actual situation of patients.

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