

Clinical effect of total thyroidectomy combined with radioactive iodine in thyroid cancer treatment

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Abstract: Aim of this research work is to observe and analyze the clinical effect of total thyroidectomy combined with radioactive iodine in thyroid cancer treatment. The 120 thyroid cancer patients treated in our hospital were enrolled as study subjects and assigned to study group (treated with total thyroidectomy and radioactive iodine) and reference group (treated with conventional total thyroidectomy). The overall treatment efficacy was compared between the two groups. Comparison of overall treatment efficacy of the two groups showed that the study group has superior results to the reference group ($P < 0.05$). Comparison of incidence of recurrent laryngeal nerve injury in the two groups revealed no significant differences, $P > 0.05$. However, in life quality assessment, the study group was significantly superior to the reference group in terms of physiological function, psychological function, social function, and overall life quality scores, $P < 0.05$. Total thyroidectomy combined with radioactive iodine can well improve the overall treatment efficiency and enable patients to have higher quality of life at the same time.

Keywords: Total thyroidectomy, radioactive iodine, thyroid cancer, treatment effect.

INTRODUCTION

In clinical practice, thyroid cancer is a common malignancy. The number of thyroid cancer patients is on the rise with the social environment changes, the accelerated pace of work and improved dietary habits. The relevant data survey shows that annual probability of thyroid cancer in China is 0.5-10 per 100,000 (Wang *et al.*, 2017, Rashid *et al.*, 2017). Thyroid cancer as a malignant tumor of the endocrine system brings great effect on people's normal quality of life and work, and leads to greatly increased mortality.

The thyroid gland is located below the thyroid cartilage in the neck of the human body and on both sides of the trachea and shaped like a butterfly, it is like shield armour and thus acquires its name (fig. 1). The thyroid gland is divided into left and right lobes and isthmus. The left and right lobes are located on both sides of the lower throat and upper organs. Its upper end starts from the middle point of the thyroid cartilage, its lower end reaches the sixth tracheal ring, sometimes reaching suprasternal fossa or substernal part (Zhao *et al.*, 2017, Shareef *et al.*, 2017). A common manifestation of thyroid cancer is thyroid nodule (fig. 2). Thus, in case of nodular goiter, it is important to distinguish the benign and malignant nature of the nodule.

The current effective treatment for thyroid cancer is surgical treatment. The prognosis of thyroid cancer is relatively fine among malignant tumors. Usually, patients still have a survival rate of about 10 years in case of thyroid cancer metastasis. However, the key is how to

choose an effective surgical plan. This study is to observe and analyze the effect of total thyroidectomy combined with radioactive iodine in thyroid cancer treatment.

MATERIALS AND METHODS

The 120 thyroid cancer patients treated in our hospital from January 2015 to March 2018 were enrolled as the study subjects. This paper has a rigorous structure, and the conclusion has been approved by relevant ethics and relevant departments. All the patients were definitely diagnosed with thyroid cancer via clinical examinations. There were 86 cases of papillary carcinoma (fig. 3) and 34 cases of follicular carcinoma (fig. 4). For tumor system staging, there were 60 cases, 35 cases, and 25 cases in Phase I, Phase II, and Phase III. All patients have the right to know and signed relevant informed consent.

The patients were divided into the study group and the reference group each having 60 cases according to random grouping. In the study group, there were 20 males and 40 females ranging in age from 20 to 68 years with an average age of (43.6 ± 2.9) years. In the reference group, there were 22 males and 38 females ranging in age from 22 to 70 years with an average age of (42.8 ± 2.6) years. Comparison of the two groups' relevant data indicates comparability, $P > 0.05$.

The two groups received different treatment, with total thyroidectomy for the reference group and total thyroidectomy combined with radioactive iodine for the study group. The patients were strictly sterilized before the formal operation. The thyroid gland was fully exposed to amid general anesthesia. The surgeon strictly followed

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the standard operating procedures during the operation. The thyroid suspensory ligament was separated and severed by ultrasound knife, and superior thyroid blood vessels were cautiously handled. The upper and lower thyroid veins were subjected to ligation cutting and the thyroid isthmus was cut first by bluntly separating it with keily clamp and then cutting with ultrasound knife (Liu *et al.*, 2017; Subhani *et al.*, 2018). During the surgical operation, the vagus nerve and recurrent laryngeal nerve signals were observed and monitored by recurrent laryngeal nerve monitor. Meanwhile, close attention should be paid to see that the laryngeal nerve and the thyroid gland will not be damaged. After excision from posterior lobe of thyroid gland, hemostasis was adequately performed, followed by suturing and standard drainage.

The study group received the same treatment as the reference group plus radioactive iodine treatment. For the main method, at 4th weeks after surgery when the thyrotropin value was above 30uIU/mL, active radioactive iodine treatment started. Strictly based on the patient's actual state of illness, through scientific analysis of postoperative thyroid radionuclide imaging results to indicate postoperative residual amount, the treatment dose was rationally adjusted and controlled within the range of 80-200m Ci. Continuous treatment was needed for 7 days.

The overall treatment efficacy of the two groups was observed and compared. There are three criteria for evaluating the treatment effect (Chen 2015, Alvi *et al.*, 2017), markedly, effective, invalid. If there is significant improvement in patient's clinical symptoms and signs after treatment, with quality of life improved and no complications, the treatment is markedly. If the patient's clinical symptoms and signs are relieved to some extent after treatment, and no serious complications is seen, the treatment is effective. If there is no change in the patient's clinical signs and symptoms after treatment, and the condition aggravates or deteriorates, with quality of life severely reduced, the treatment is invalid. In addition, statistics of patients' physiological scores, psychological scores, social scores, and overall quality of life scores was made through health status survey questionnaire (SF-36). The incidence of recurrent laryngeal nerve injury in the patient was recorded.

STATISTICAL ANALYSIS

The statistical analysis software used was SPSS 21.0. Where, the measurement data were expressed as mean \pm average ($\bar{x} \pm s$), and t was used for comparison between groups; the count data were expressed using natural numbers (n) and percentages (%), and X² was used for comparison between groups. P<0.05 indicates statistical value.

RESULTS

Comparison of overall treatment efficacy between the two groups

As shown in table 1, after different treatment programs were implemented, the overall treatment efficacy is higher in the study group than in the reference group, P<0.05, statistically significant.

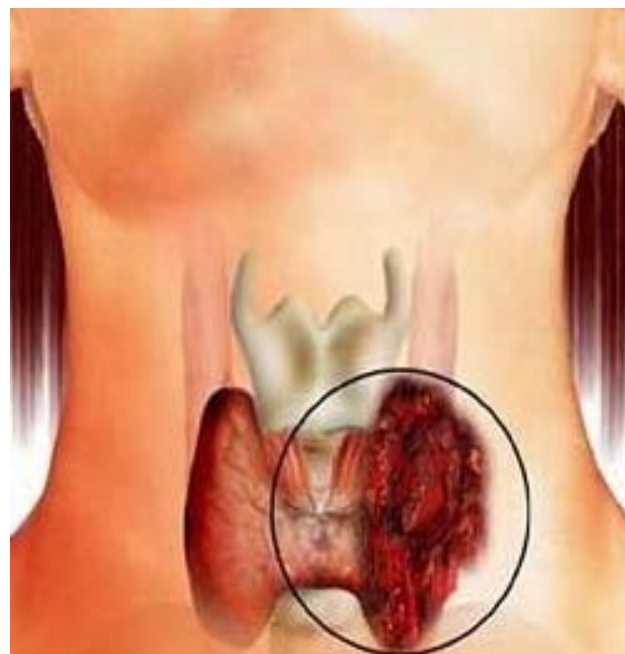


Fig. 1: Thyroid cancer



Fig. 2: Thyroid nodule

Comparison of quality of life scores between the two groups

As shown in table 2, comparison of physiological function scores, psychological function scores, social function scores, and quality of life scores reveals that the study group is significantly superior to the reference group, P<0.05, statistically significant.

Comparison of recurrent laryngeal nerve injury in the two groups

As shown in table 3, 6 months of follow-up to observe the incidence of recurrent laryngeal nerve injury in the two

Table 1: Comparison of overall treatment efficacy between the two groups [n(%)]

Group	Case number	Markedly	Effective	Invalid	Overall treatment efficacy
Study group	60	40	17	3	57(95.00)
Reference group	60	30	16	14	46(76.67)
X ²					13.18
P					<0.05

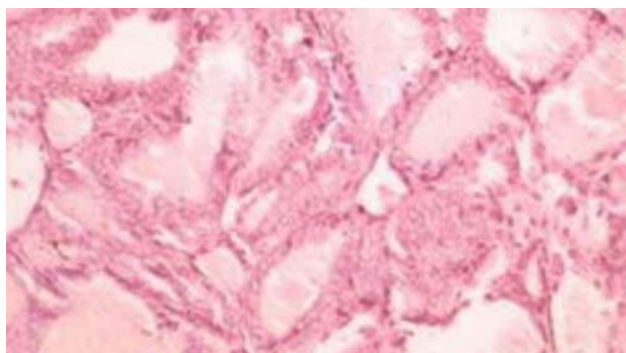
Table 2: Comparison of quality of life scores between the two groups ($\bar{x} \pm s$)

Group	Case number	Physiological function score	Psychological function score	Social function score	Quality of life score
Study group	60	0.97±0.32	1.30±0.52	1.29±0.15	4.81±0.55
Reference group	60	0.43±0.29	1.01±0.05	0.82±0.23	3.26±1.20
t		3.58	5.31	5.09	8.36
P		<0.05	<0.05	<0.05	<0.05

Table 3: Comparison of recurrent laryngeal nerve injury in the two groups [n(%)]

Group	Case number	Incidence of permanent unilateral recurrent laryngeal nerve injury	Incidence of temporary unilateral recurrent laryngeal nerve injury	Overall incidence
Study group	60	1(1.67)	1(1.67)	2(3.34)
Reference group	60	2(3.33)	2(3.33)	4(6.66)
X ²				10.05
P				<0.05

groups showed no significant difference between the groups, $P>0.05$, not statistically significant.

**Fig. 3:** Papillary carcinoma

DISCUSSION

Once one suffers from thyroid cancer, a common malignancy, not only body function will be greatly affected, with quality of life lowered, but also psychological stress will be generated. Lymph node enlargement of the neck can be formed in the early stage of the disease. There will be dyspnea, hoarseness, and dysphagia symptoms as the disease progresses (Xie 2016; Khan *et al.*, 2017). Failure to adopt effective solutions in time will pose a serious threat to life safety. At present, the major treatment plan for thyroid cancer is surgery, i.e. total thyroidectomy. This surgical measure can completely

remove the lesion site. Meanwhile, area around the lesion is closely monitored to record the status of the resected lesion and provide important reference for the diagnosis and treatment in the next step. After complete resection of the lesions, the site where the cancer cells live will be completely eliminated, thereby preventing further spreading of the disease (Shareef and Akhtar 2018). The relevant studies have pointed out that if improper range is chosen for the lesion resection, disease relapse will follow, so great attention should be paid to this problem. Iodine is a trace element essential for human survival. The low synthesis of thyroid hormone is a result of lack of iodine, which can lead to increased thyroid hormone levels, followed by thyroid follicular enlargement, eventually increasing the risk of thyroid cancer. Therefore, radioactive iodine can be used for treatment of thyroid cancer. In the course of treatment, tumor cells can take up radioactive iodine which will eliminate tumor cells and supplement sufficient iodine content at the same time. In this way, radioactive iodine treatment can better consolidate the treatment effect and reduce the recurrence rate in the later period.

According to this study, comparison of overall treatment efficacy between the two groups shows the study group is superior to the reference group, $P<0.05$; also, the study group is significantly superior in terms of quality of life, $P<0.05$, proving that total thyroidectomy combined with radioactive iodine provides good reliability.

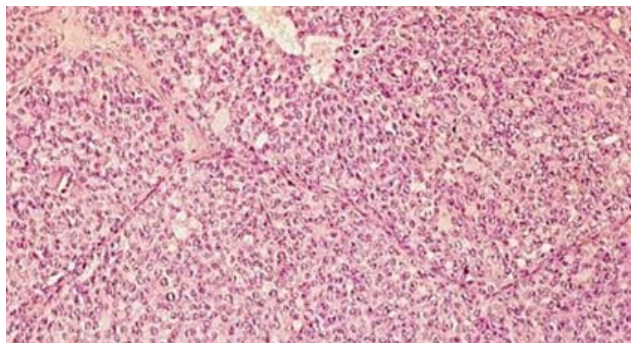


Fig. 4: Follicular carcinoma

CONCLUSION

In conclusion, total thyroidectomy combined with radioactive iodine in thyroid cancer treatment can improve the overall treatment efficacy, help patients to maintain high quality of life, reduce the incidence of recurrent laryngeal nerve injury.

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