

# MANAGEMENT OF SOLITARY THYROID NODULE

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## ABSTRACT

**Objective:** To evaluate patients presenting with solitary thyroid nodule and to stream line the management policy.

**Material and Methods:** This is a descriptive, hospital based study, done prospectively, comprising of 50 patients, conducted at Saidu Group of Teaching Hospital from Feb. 2001 to March 2003. These patients were first assessed clinically by taking history, physical examination. Relevant investigations such as thyroid function test, radioisotope scans, ultrasound, antibodies estimation, radiological evaluation i.e. x-ray chest and neck and above all fine needle aspiration cytology were done in these patients. After making a diagnosis the patients were categorized into two groups for the purpose of final treatment. Those who required surgery were admitted and those who needed medical treatment were treated on out patients basis. Thyroid surgery ranging from lobectomy and isthmusectomy to near total and total thyroidectomy was performed depending upon age of the patient, size of the swelling and histological /cytological nature of the nodule. All the patients were regularly followed post operatively at 3 months, 6 months and 1-year interval and the results calculated.

**Results:** Most of the patients were female, with female to male ratio of 2.8: 1. Majority of the patients presented with swelling in front of the neck. Out of fifty patients, seven responded to non-surgical treatment. One with anaplastic carcinoma, an elderly otherwise unfit patient received radiotherapy and the rest were subjected to various types of surgical procedures. Transient hoarseness and mild to moderate pain in the neck, lasting for a few weeks time was noted postoperatively in some of the patients. We did not have any operative mortality.

**Conclusion:** Although most of the nodules (about 90%) evaluated turned out to be benign in nature but the fear of cancer, the anxiety associated with and the likely outcome of treatment demands a thorough work up of the condition and a long term follow up. Apart from medical treatment, aspiration of benign purely cystic nodules and surgical excision plays a major role in the alleviation of the disease.

**key words:** Solitary Thyroid Nodule, Surgical and Non Surgical Treatment.

## INTRODUCTION

A solitary thyroid nodule is defined as a goiter, which on clinical examination appears to be a single nodule in an otherwise normal palpable gland<sup>1,2</sup>. It occurs in 3-4% of the general adult population<sup>2,3</sup>. Solitary thyroid nodule may be noticed by the patient or other family member or the attending physician, just incidentally. At other times the patient may seek medical advice because of cosmetic reasons, pressure symptoms or signs and symptoms of thyrotoxicosis. Most of the patients are concerned about the potential risk of malignancy of such nodule<sup>3</sup>.

A clinically Solitary thyroid nodule is

more sinister than the thyroid presenting with multiple nodules and has higher incidence of malignancy i.e. 15-20% as compared to 5-10%<sup>4</sup>. The prime objective of the attending physician/surgeon in a patient with thyroid nodule is to exclude malignancy. Investigations of a clinically solitary thyroid nodule must include a detailed history, clinical and biochemical assessment of thyroid status; ultrasonographic scanning to determine whether, the nodule is solid or cystic. Approximately 20 percent of isolated thyroid swellings are cystic<sup>5</sup>.

The value of isotope scanning in the diagnosis of thyroid swelling is rarely practiced now a day. Other investigations

include autoantibodies and radiographs of the neck and chest. Above all the importance of fine needle aspiration cytology has to be stressed. It is a simple, cost effective, well tolerated procedure with high diagnostic yield (up to 95%)<sup>2,6</sup>. Appropriate treatment can be planned for, once the diagnosis is confirmed. This study was conducted to evaluate patients presenting with solitary thyroid nodule and to stream line the management policy.

## MATERIAL AND METHODS

This study was carried out from February 2001 to March 2003, at Saidu Group of Teaching Hospital Saidu Sharif, Swat .It consisted of 50 patients who presented with a clinically solitary thyroid nodule. All the patients were received in out patient clinic, from different areas of Malakand Division and were selected irrespective of their age and sex.

These patients were first assessed clinically by taking history, physical examination and were then subjected to a plethora of investigations including estimation of serum T3, T4 and TSH levels, radioisotope scan were done where indicated, ultrasonic examination of neck and fine needle aspiration cytology. After making a diagnosis the patients were categorized into two groups for the purpose of final treatment. Those who required surgery were admitted and those who needed medical treatment were treated on out patients basis. Thyroid surgery ranging from lobectomy and isthmusectomy to near total and total thyroidectomy was performed depending upon age of the patient, size of the swelling and histological /cytological nature of the nodule .

All the patients were regularly followed post operatively at 3 months, 6 months and 1 year interval and the results calculated.

## RESULTS

During this study fifty patients from both sexes were selected with a male to female ratio of 1:2.8. The age range was from 14 to 75 years with mean age of 36 years. In 27 (54%) patients the duration of nodule first noticed was less than 1 year, in 15 (30%) it was between 1 and 2 years and 8 (16%) had duration of more than 2 years. Three (6%) of the patients had a positive family history of thyroid disease. None had a history of

previous irradiation or thyroid surgery.

The main presentation was swelling in the neck (100%). Six (12%) had pain in the swelling and 5 (10%) had difficulty in swallowing. In 8 (16%) there was difficulty in breathing. Voice change was noted in 3 (6%) of the patients.. In 12 (24%) patients heat intolerance, in 4 (8%) nervousness and irritability, in 3 (6%) change in appetite was recorded and there was history of weight loss in 4 (8%) patients.

Right lobe was the commonest site of the gland involved (64%), followed by left lobe and isthmus. In 3(6%) patients the size of the nodule was 1-2 cm. In 29 (58 %) the size was 2-5 cm, while in 18 (36%) it was more than 5 Cm. Nodule was mobile in 48 (96%) patients. Consistency was mostly firm to hard. Cervical lymph node enlargement was seen in one patient. None of the patient had eye signs of toxicity. Five (10%) had tachycardia and 4 (8%) had tremors. On indirect laryngoscopy right vocal cord was fixed in 2(4%) patients. All the patients were subjected to the following investigations (see table 1).

Treatment plan of the patients was devised on the basis of the size and consistency of the nodule, age of the patient and the results of investigations including cytology. Medical treatment was given to 6 patients with a nodule size up to 3 cm and benign on FNAC. They were given thyroxin therapy (0.2mg/day) after reassurance. In 6-month time, in 2 patients a decrease in the nodule size was observed while it remained unaffected in the rest of 4 patients. These 4 patients were subsequently subjected to surgery. One patient with extensive follicular carcinoma with metastatic deposits in the lungs was referred for radioiodine therapy because of her old age and unfitness for general anesthesia. The rest 43 (86 %) patients were subjected to some form of surgical procedure. Purely cystic nodules, benign on FNAC and less than 3 cm in diameter were aspirated twice, at a monthly interval. Two of the three disappeared completely. In 3 (6%) patients nodule showed reduction in size after aspiration and tetracycline instillation (100mg/ml in normal saline).

In 6 patients (12%) with cystic nodules, excision was carried out. It included those 2 patients who did not respond to the

## Investigations of patients with solitary thyroid nodule

S.No.	Investigation	Nature of Disease	No. Of patients	% age
1	Thyroid scan	Hot nodule	3	6.
		Cold nodule	47	94.
2	Thyroid ultrasound	Purely solid	26	52.
		Purely cystic	11	22.
		Mixed	13	26.
3	a) T3	Normal	48	96.
		> Normal	2	4.
		< Normal	0	0
	b) T4	Normal	48	96.
		> Normal	2	4.
		< Normal	0	0
	c) TSH	Normal	48	96.
		> Normal	0	0
		< Normal	2	4.
4	Thyroid antibodies estimation	< Normal	50	100
5	FNA Cytology	Benign	43	86.
		Suspicious	3	6.
		Malignant	4	8.
6	Excision Biopsy (n=43)	Nodular Goitre	16	23.
		Colloid Goitre	12	24.
		Adenoma	4	8.
		Papillary carcinoma	1	2.
		Follicular carcinoma	2	4.
		Medullary carcinoma	1	2.
		Undifferentiated carcinoma	1	2.
		Simple cyst	6	12.

Table-1

above treatment and 4 had a cyst size more than 5 cm in diameter. In 8 patients with solid or mixed (solid and cystic) benign nodules less than 5 cm in diameter, lumpectomy was performed. In 5 (10%) patients with a bigger nodule confined to one lobe, lobectomy was done. Five (10%) underwent isthmusectomy. 11 patients including one with papillary carcinoma and the three suspicious of malignancy on FNAC were subjected to lobectomy with isthmusectomy. Total thyroidectomy was carried out in 2 patients with follicular and medullary carcinoma, both had intrathyroidal lesion. In 1 patient with undifferentiated carcinoma, debulking of the tumour was done to relieve respiratory difficulty (Table No.2).

All the patients with malignant nodules were later on, referred for total body radioiodine scanning to look for extra thyroidal

extension of the disease. None had been found to have a metastatic disease. Patients with medullary and undifferentiated carcinomas received a course of external beam radiotherapy.

Histological results of the biopsy specimens are listed in table No.1. The patients were followed according to the scheduled protocol. No recurrent or metastatic disease had been found at one year in patients having differentiated carcinoma.

## DISCUSSION

Solitary thyroid nodules are more common in females as compared to males<sup>3</sup>.

Razack reported female to male ratio of 2.2:1<sup>7</sup>. In our study it is 2.8:1. The incidence of malignancy in thyroid nodules is somewhat greater in men as compared to

## Treatment (n = 50)

S.No.	Mode of treatment	No. of Patients	% age
1	Medical		
	Observation and reassurance + thyroxin	6	12.
2	Radioiodine	1	2.
3	Surgical		
(i)	Cyst aspiration	2	4.
(ii)	Cyst aspiration + tetracycline injection	3	6.
(iii)	Cyst excision	6	12.
(iv)	Lumpectomy	8	16.
(v)	Lobectomy	5	10.
(vi)	Lobectomy + isthmusectomy	11	22.
(vii)	Isthmusectomy	5	10.
(viii)	Total thyroidectomy	2	4.
(ix)	Debulking	1	2.

Table-2

female of comparable age<sup>3,8</sup>. We made more or less the same observation but the overall number of patients is less. In a proportion of adults with thyroid carcinoma, exposure to ionizing radiation especially in childhood is a well-documented factor<sup>9</sup>. None of the patients included in this study had a history of exposure to ionizing radiation. Majority of the patients had nodule in the right lobe followed by left lobe and isthmus. The lower pole was commonly affected. The findings are almost consistent with that of Messaries<sup>10</sup>. There is no obvious reason for the distribution of the nodules within the gland. Only 3(6%) of the patients had hot nodules on thyroid scan and 2(4%) had elevated thyroid hormones level. This shows the low incidence of hyperthyroidism in patients with a solitary thyroid nodule<sup>11</sup>.

In our study ultrasonographic examination of the nodules revealed 26(52%) solid, 11(22%) cystic and 13(26%) mixed nodules, more or less comparable with that of Aschcraft and Van herle who found that 69% of the nodules in their study were solid, 12% cystic and 19% mixed<sup>12</sup>. Malignancy is more common in solid nodules.

M Allaudin et al<sup>13</sup> reported an incidence of 17.5% malignancy in cold nodules. In another study it is 27%<sup>14</sup>. In our study it is 8% so it may vary with increase in overall number of patients. Nodules demonstrating some uptake of isotope are usually benign<sup>15</sup>. Conversely cold nodules on

scan and solid on ultrasonography have the greatest chance of being malignant<sup>16</sup>. In our study those patients proved to have carcinoma who had solid nodules on ultrasonography.

Fine needle aspiration is a safe procedure and has become a first line diagnostic tool, with diagnostic accuracy rates as high as 90%<sup>17</sup>. La-Rossa et al<sup>18</sup> reported 2.5% false negative and 1.1% false positive results in their study. We relied mostly on FNAC in making pre-operative diagnosis. It was inconclusive only in 3 (6%) patients. Subsequent histology revealed benign condition in these patients. The biochemical assessment of thyroid status is important in determining the form of therapy and attainment of euthyroid state of the patient.

Treatment of a solitary thyroid nodule can be divided into medical and surgical. Medical treatment is aimed at reducing the size of nodule with thyroxin and radioiodine therapy. In a study conducted by Celani et al<sup>19</sup> 55.7% were responders and 19.7% partial responders to thyroxin suppressive therapy. In our study the response rate to suppressive thyroxin therapy was about 33%. Radioiodine therapy is indicated for elderly, unfit or those with metastatic differentiated thyroid carcinoma. It is also indicated in elderly patients with toxic autonomous nodule<sup>2,20</sup>. Surgery plays a vital role in management of solitary thyroid nodule. Cyst aspiration is carried out in patients with purely cystic

nodules with clear aspirate.

If no satisfactory response to aspiration only then cyst aspiration and injecting 2-3ml tetracycline in a dose of 100mg/ml in normal saline,, is a simple and safe procedure to obliterate the cyst,<sup>21</sup>. If the cyst does not respond to the above procedure then excision is the only choice. In our study 5 out of 11 patients with simple cyst did respond to aspiration and aspiration plus instillation of tetracycline. So it may be considered as simple and effective treatment in dealing with simple cyst. Other surgical procedures like lumpectomy, lobectomy, isthmusectomy and lobectomy with isthmusectomy depending upon the nature and size of nodule may be employed. There is considerable controversy concerning the most appropriate surgical treatment of patients with papillary cancer. Many authors have reported total thyroidectomy for all thyroid cancers as the treatment of choice<sup>22,23,24</sup>. Others recommend lobectomy or less than total thyroidectomy for papillary carcinoma of the thyroid<sup>25,26,27</sup>.

We followed the Lahey's clinic criteria to deal with differentiated carcinoma<sup>2,7</sup>.

### CONCLUSION

It is imperative to investigate the patient presenting with a solitary thyroid nodule as it yields a higher incidence of malignancy. The surgical management in most patients with thyroid cancer is effective with favourable outcome. This study gives some insight into the importance of categorizing patients into those who can be treated medically and those treated surgically. If a reliable diagnosis could be made, operation would be avoided in a substantial number of patients. This will decrease workload, hospital expenditure and psychological trauma to the patient.

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