

Role of Fine Needle Aspiration Cytology In Differentiation and Management of Solitary Thyroid Nodule

Mohammad Sajjad Khattak¹, Naseeb ur Rehman², Hina Khan³, Asim Mohammad⁴, Rafi Ullah⁵, Mushtaq Ahmad⁶

¹Professor of Pathology, Bannu Medical College Bannu, Pakistan

²Associate Professor of Medicine, Khalifa Gul Nawaz Teaching Hospital Bannu, Pakistan

³Assistant Professor Gyne/Obs, Khalifa Gul Nawaz Teaching Hospital Bannu, Pakistan

⁴Assistant Professor Pathology KIU Institute of Medical Sciences Kohat, Pakistan

⁵Assistant Professor Surgery, Khalifa Gul Nawaz Teaching Hospital Bannu, Pakistan

⁶Associate Professor Pathology Saidu Medical College Swat, Pakistan

Correspondence:

Mohammad Sajjad Khattak

Email: sajjadkhattak66@gmail.com

Abstract

Background: Solitary thyroid nodule, 4% of the adult population, is a common finding in patients. This needs close attention to differentiate between cysts and benign or malignant neoplasm.

Objective: To see the cytological differentiation of different solitary thyroid nodules and to manage simple thyroid cysts by aspiration of the cyst fluid.

Material and Methods: In this Descriptive study, which was carried out in the Pathology department, Khalifa Gul Nawaz Teaching Hospital Bannu.KPK, Pakistan from January 2014 to December 2019. A total of 58 STN were aspirated. Aspiration was obtained using an aseptic technique and slides were prepared, stained, mounted, labeled, and reported by Pathologist. The data was analyzed by using a Statistical Package for Social Sciences (SPSS) version 20 for frequencies with percentages and mean with standard deviation.

Results: In this study, the mean age was 34.4±11.7 years and the age range was from 15 to 70 years. The most common age group was 36-45 years followed by 46-55 years. Male to female ratio was 2:1.5. The most common lesion was simple cyst 36(62.06%), followed by follicular lesions 18(31.03%), papillary carcinoma 03(5.17%) and anaplastic carcinoma 01(1.72%). It was a simple serous cyst that had a low frequency of reappearance of 21.73% followed by a simple hemorrhagic cyst of 40% and a colloid cyst of 66.6% after a month follow-up.

Conclusion: Simple cyst was the commonest lesion followed by follicular lesion. Aspiration can be considered the first-line procedure for the diagnosis and treatment of solitary thyroid cysts as most of these disappear for six months after complete aspiration.

Keywords: Solitary Thyroid Nodule, FNAC.Simple cyst thyroid. Follicular lesions. Papillary carcinoma. Anaplastic carcinoma.

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Introduction

The thyroid gland is one of the largest endocrine glands situated in front of the neck. This regulates the basal metabolic rate of the body¹. The normal thyroid gland is

not palpable, it becomes palpable when enlarged. Solitary thyroid nodules are one of the commonest. Presentation is about 45-8% of the adult population by palpation and this becomes 13% -67% when ultrasound

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is used for detection. Therefore, using ultrasound, it can be detected 10 times more as compared to detection by palpation²⁻⁴. STN

frequency increases with age. In children it is rare but when present, must be investigated to rule out malignancy. These may be cystic or solid on ultrasound, whereas on scan it may be cold, warm, or hot. Cold means no hormone production, warm normal hormone production, and hot overproduction of hormone⁵. STN is benign in 90% of cases either cystic or solid. Clinically it may present as swelling usually painless may cause breathing or swallowing difficulties⁶.

Thyroid nodules may be malignant accounting for about 0.5% of all cancer⁷. This study aimed to see the role of FNAC in the differentiation and management of solitary thyroid nodules.

Material and Method:

Place and Duration: The study was carried out in the Pathology department of Khalifa Gul Nawaz Teaching Hospital Bann from January 2014 to December 2019 in collaboration with other clinical departments of this Hospital. In this study, a total of 58 FNAC of STN were performed.

Inclusion criteria were all patients with STN either cystic or solid detected by ultrasonography.

Exclusion criteria were patients with multi-nodular goiter diffuse goiter, multinodular goiter with cystic changes, and multiloculated /complex cysts on ultrasound. All these STN both solid and cystic were subjected to FNAC. Aspiration was performed by using a 10 cc disposable syringe adapting aseptic technique, slides prepared, fixed in ethanol, and stained with Giemsa and H&E stain, mounted with DPX, labeled, and reported by the Pathologist.

Sample size: All simple thyroid cystic lesions were almost completely aspirated under an ultrasound guide and followed up for six months to see the refilling of the cyst.

Data analysis: The data was analyzed by using a Statistical Package for Social Sciences (SPSS) version 20 for frequencies with percentages and mean with standard deviation.

Results:

In this study, the mean age was 34.4 ± 11.7 years and the age range was from 15 to 70 years. The most common age group was 36-45 years followed by 46-55 years. Female to male ratio was 2:1.5. The most common lesion was simple cyst 36(62.06%), followed by follicular lesions 18(31.03%), papillary carcinoma 03(5.17%) and anaplastic carcinoma 01(1.72%). Table I. The cystic lesions 36(62.06%) were further sub categorized into simple serous cyst 22/36 (61.11%), simple hemorrhagic cyst 11/36 (30.55%) and colloid cyst 03/36 (8.33%). It was simple serous cyst which had low frequency of reappearance 21.73% followed by simple hemorrhagic cyst 40% and colloid cyst 66.6% after six month follow up. Table II.

Type of STN	No. of lesion	percentage
Simple cyst	36	62.06%
Follicular lesion	18	31.03%
Papillary carcinoma	03	5.17%
Anaplastic carcinoma	01	1.72%
Total	58	100%

Type of thyroid cyst	No. of cyst	Disappeared on first aspiration	Reappeared after six months of aspiration
Simple serous cyst	23	23	05(21.73%)
Simple hemorrhagic cyst	10	10	04(40%)
Colloid cyst	03	03	02(66.6%)

Discussion:

Solitary thyroid nodule is common in female as compared to male. The importance of STN is associated with increased risk of neoplasia as compared to other lesions of thyroid. About 40% of STN are follicular adenomas, 20% are malignant and remainder are non neoplastic usually. The STN is labeled cystic when it is predominantly cystic on ultrasound. About 50% of STN are cystic and needs aspiration for diagnosis as well as for treatment purposes⁸.

In this study the age range was from 15 to 70 years with mean age of 34.4 ± 11.7 years. Female to male ratio was

2:1.5. Study conducted by Rajendran et al⁹ in 2018 Raza et al¹⁰ 2006, Jaiswal et al¹¹ 2018 and Surriah et al¹² in 2019 the age range was from 11-60 years, 18-65 years, 15-70 years and 10-70 years respectively, where as female to male ratio was 11.5:1, 1:2.3, 6.1:1 and 3:1 respectively.

In this study the most common lesion was simple thyroid cyst 36(62.06%), followed by follicular lesions 18(31.03%), papillary carcinoma 03(5.17%) and anaplastic carcinoma 01(1.72%). In a study conducted by Raza et al¹⁰ simple thyroid cyst were 13.88% followed by follicular lesion and papillary carcinoma each 5.55%.

In another study conducted by Jaiswal et al¹¹ simple thyroid cyst was 60% followed by papillary carcinoma 18% and follicular lesions were 4%.

Simple thyroid cyst are usually benign. Fine Needle Aspiration Cytology is the initial diagnostic as well as therapeutic approach to treat solitary thyroid cyst, although recurrence rate is high upto 50%¹³. In case a cyst recurs after a second aspiration, surgical treatment is recommended. Thyroxin therapy reduces risk of recurrence especially when aspiration is performed few months after thyroxin use. Also alcohol instillation after complete aspiration is an alternative to thyroxin therapy. This technique may be safe, effective and treatment of choice in future¹⁴.

Simple thyroid cyst disappears completely after aspiration and a loculated /complex cyst usually do not disappear completely after aspiration and may have an association with malignancy and needs surgical intervention¹⁵.

In this study the simple thyroid cyst 62.06% were sub classified into simple serous cyst 23(63.88%), simple hemorrhagic cyst 10(27.77%) and colloid cyst 03(8.33%). This recurrence rate was high in colloid cyst 66% followed by simple hemorrhagic cyst 40% and it was low in simple serous cyst 21.73%. In this study the overall recurrence rate was 30.55% after six months.

Other studies have not sub classified the simple thyroid cyst and their overall recurrence rate after a different time period is given in Table: III.

Study name	No. of patients	Follow up in months	No. of of aspiration	Recurrence rate
This study	36	06	1-2	30.55%
Yasuda et	61	06	1-4	28%

al ¹⁵				
Monzani et al ¹⁶	20	12	1-2	05%
Verde et al ¹⁷	10	01	1	20%
Cho et al ¹⁸	22	10	1-6	36%
Delprete et al ¹⁹	98	12	1-4	06%

Conclusion:

Simple cyst was the commonest lesion followed by follicular lesion. Aspiration can be considered as first line procedure for diagnosis and treatment of solitary thyroid cyst as most of these disappeared for six months after complete aspiration.

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