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# Histopathological Study in Patients with Enlarged Thyroid gland

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**Abstract**: The aim of this research was to scrutinize the histomorphological evaluation of thyroid lesions in linkage to age and sex of the individuals. Materials and methods: This study evaluate the information from 46 thyroidectomy specimens received from october2018 to April 2019 at the Department of cytology, Al-khansaa teaching hospital and laboratory of Mohammed Abdul–Aziz Hayawi. Results: among these 38(82.60%) were from females and 8 (17.39%) were from males with male to female ratio 1:4.5 .The patients age ranged from 1 to 70 years . The large number of lesions are non-neoplastic, found 82.60% (n=38) cases and neoplastic lesions found 17.39% (n=8) cases. Non toxic goiter was the majority lesion approximately 68.42% of all non-neoplastic lesions and about 56.5% of all thyroid lesions. Among other non-neoplastic lesions 5 patients of thyroiditis and three patients of thyroglossal duct cyst were showed. There were 1 malignant tumors and 7 benign tumors in neoplastic lesions. Through the non malignant tumors 3 were follicular adenoma and 1 was Hurthle cell adenoma. Medullary carcinoma was cancer type occur in 1 patients. Conclusion: Our research confirms that non neoplastic type are much widespread in this organ biopsies in contrast to neoplastic type.

**Keywords:** Thyroid diseases, Hashimoto thyroiditis, Lymphocytic thyroiditis, Focal thyroiditis, Thyroglossal cyst

## Introduction

Thyroid gland found in front of the trachea and immediately beneath the larynx on each side (Guyton & Hall, 2006).It secretes calcitonin, thyroxine (T4) and triiodothyronine (T3) hormones (Tsegaye & Ergete, 2003).

Thyroid diseases are serious because most are docile to medical surgical or management. These diseases are accompanied with mass lesions of the thyroid, hyperthyroidism, hypothyroidism (De Benoist, Mclean, Andersson& Rogers,2008).

There are many patterns of thyroid diseases one of it is thyroid neoplasm which classified in two types. The popular non malignant tumor of neoplasm thyroid diseases is adenoma. Thyroid cancer is the other kind of neoplasm thyroid disease, which is the most hesitancy endocrine malignancy (Rahman etal,2013 **)**.

Depending on the statistics data of United States cancer in 2012, malignant thyroid is thought to be the fifth most prevalent recognize malignant in female. Occurrence of malignant this organ is further popular in Saudi Arabia as contrast to the countries in westerner world. It is consider the 2nd widespread cancer followed breast malignant in women (Boone, Fan & Hanna, 2003 **).**

Autoimmune thyroid disease (AITD) is the extreme widespread autoimmune in this organ defect involving of Hashimoto's thyroiditis (gotirous) atrophic thyroiditis, thyroid accompanied ophthalmopathy, postpartum thyroiditis, Graves' disease and silent thyroiditis.These may appear consecutively and sometimes synchronously, in the same patient. These defect portion antibodies against TSH receptor, thyroglobulin (Tg Ab) and thyroid peroxidase (TPO Ab).It is commonly affected middle age men and women. Over to 1% of men and approximately 4% of women are influenced worldwide. It is more popular with forward age; more than 10%

population of age above 75 years is affected. Ultrasonographic appearance, clinical appearance, FNAb findings and autoantibody status are very useful in recognition of AITD(Trbojević & Djurica, 2005 **)**.

One of the popular autoimmune disease is Hashimoto's thyroiditis, which leads to the death.The infiltration of lymphocytic thyroid follicles is the pathophysiological characteristic of this disease. This disease consider as a model not solely for this organ disease, but also for the rest autoimmune disease in the human body (Parvathaneni , Cheriyath , & Fischman ,2012 **).**

Graves' disease is an autoimmune disease recognize by ophthalmopathy, diffuse goiter, hyperthyroidism, and, scarcely dermopathy. Although thyroid-stimulating hormone (TSH) screening has important for the recognition of this disorder, a raise consciousness of heterogeneous and even exemplary presentations is important. In spite of all the obtainable medication effectively normalize thyroid function, each is accompany with dangerous side effects. In guiding the individuals to a remediation resolution, the practitioner should not only be conscious of the prompt risks and advantage of treatment but should also deem near to best maintain the individual's long-term metabolic health (Ginsberg, 2003) **.**

The so prevalent thyroid disease in everywhere of the sphere is non-toxic goiter and is suppose to influence approximately 200 million persons. It is commonly widespread in high land regions but also appears in non-high land places distant from sea (Cotran, Kumar, & Robins, 1994) . There is two style of non toxic goiter an endemic goiter, which happening in a special geographic local places is higher than 10% of the individuals. It is so popular_in everywhere of the sphere and widespread in mountainous regions. A decreased absorption of iodine is lead to this disorder. The other style called sporadic goiter is numerous low prevalent than the endemic type (Tsegaye &Ergete 2003)**.**

The study shed light on the histomorphologic and hesitancy style of thyroidectomy biopsies, study the influence of age and gender as risk factor for shrinking thyroid diseases, to recognize intricacy and relation circumstance of thyroid diseases.

## Materials and Methods

Our research is retroactive action in Dept. of Histo-cytopathology of Al-kansaa teaching hospital and the laboratory of Mahmoud Abdl-Aziz Hayawi, Mosul, Iraq. The study period was six month from October 2018 to April 2019. This study were involved 46 biopsies of thyroid. The containment standard were whole biopsies of thyroid of any sex and age while exception standard was deficient and biopsy of thyroid that autolysed. The biopsies were fixed in 10% formalin approximately 3days. Then the fixed samples were displayed to concentration grade of alcohol 70%, , 90% then the absolute alchohol, then submerge in xylen twice then embedded in paraffin, Sectioning in the rotary microtome to 5-micron thickness , placed in water bath (40 - 45 C°) and placed it on slides then Staining method (Haematoxylin and Eosin stain) .

*Photography:*

Photography was done in college of medical veterinary of AL-Mousl University.
using digital camera with D.C.500 mega pixels.

## Results

### The Demographical image of patients

Allocation of thyroid disease in study group depending on their age:
(46) biopsies of thyroid were collected in the Dept. of histo-cytopathology of Al-Kansaa teaching hospital and the laboratory of Mahmoud Abdl-Aziz Hayawi, Mosul , Iraq from October 2018 to April 2019.The patients age extend from 1 to 70 years.

The top hesitancy of the individuals were in the fourth decade (n=16; 34.78%), then the third decade (n=11;23.91%).The large number of the thyroid lesions (n=27;58.69%) were showed in the age group 30-49 and 40-49 years. The small number of age group (70-79years) (n=1;2.17%) table(1).

Table 1. Histopathological styles of thyroid biopsies by age group

| Type of thyroid diseases | <20 | 20-29 | 30-39 | 40-49 | 50-59 | 60-69 | 70-79 | Total | Relative frequency |
|---|---|---|---|---|---|---|---|---|---|
| Nontoxic | 3 | 2 | 6 | 11 | 4 | 0 | 0 | 26 | 56.5% |
| toxic | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 4 | 8.69% |
| Hashimoto thyroiditis | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 2 | 4.34% |
| Lymphocytic thyroiditis | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 2.17% |
| Focal thyroiditis | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 4.34% |
| Thyroglossal cyst | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 3 | 6.52% |
| Adenoma | 1 | 2 | 0 | 2 | 2 | 0 | 0 | 7 | 15.2% |
| Carcenoma | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 2.17% |

*Allocation of thyroid diseases of study group depending on their gender:*

As in present study, there were 38 (82.60%) females and 8 (17.39%) males and the ratio of female to male 4.75:1 .See table (2).

Table 2. Histopathological pattern of thyroid tissue by sex group

| **Types of thyroid diseases** | **Male** | **Female** | **Female: Male** |
|---|---|---|---|
| Nontoxic | 2 | 24 | 12:1 |
| toxic | 1 | 3 | 3:1 |
| Hashimoto thyroiditis | 0 | 2 | 2:0 |
| Lymphocytic thyroiditis | 0 | 1 | 1:0 |
| Focal thyroiditis | 0 | 2 | 2:0 |
| Thyroglossal cyst | 3 | 0 | 0:3 |
| Adenoma | 2 | 5 | 2.5:2 |
| Carcinoma | 0 | 1 | 1:0 |

*Allocation of thyroid diseases depending on the non-neoplastic and neoplastic organ diseases.*

In the current research, the hesitancy of non-neoplastic and neoplastic the organ biopsies is about17.3% and about 82.6% respectively. The non-neoplastic biopsies are prevalent in 3rd to 5th decades of life table(3).

Table 3. Allocation of non-neoplastic and neoplastic thyroid disease.

| **Type of thyroid disease** | **Hesitancy** | **Relative hesitancy** |
|---|---|---|
| **Non-neoplastic** | **38** | **82**.6% |
| **Neoplastic** | **8** | **17**.3% |

*Microscopic appearance of thyroid gland in individuals with thyroid diseases*

In the patients of non toxic colloid goiter sections display thyroid follicles filled with colloid material lined by flat epithelial cells contained in a well defined cyst wall

In the case of non toxic colloid goiter (Multinodular hyperplasia) the sections of thyroid glands appear proliferation of variable sized follicular cells also accompanied with areas of hemorrhage, calcification and fibrosis figure (1).

In the patients with toxic adenoma the sections appear thyroid tissue with follicles contain pale colloid and some fine vaculated with scalloping, the size of follicles is combination of pattern degenerative changes seen between follicles the tissue surrounded by total thin capsule, figure (2), ( 3).

In the case of hashimmoto thyroiditits the section appear benign acini with Hurthel cell metaplastic alterations and thyroid paranchyme infiltrated by plasma cells lymphocyte some of them germinal centre figure(4),(5).

In the biopsy specimen of non toxic colloid goiter with focal lymphocytic thyroiditis the section appear thyroid follicles of different sizes lined by flat epithelial cells filled with colloid material associated with scattered areas of fibrosis and focal lymphocytic aggregates figure(6).

In the case of lymphocytic thyroiditis section show different size follicles filled with colloid with nodule formation, fibrosis and inflteration by heavy growth of lymphocyte figure (7).

In the case of thyroglossal cyst the sections of thyroid show pseudo stratified ciliated columnar epithelium with underlying mucosa containing vascular channels of different sizes mixed with few inflammatory cells and remnant of thyroid follicles embedded within skeletal muscles, figure (8).

In the cases of follicular adenoma of thyroid the sections show closely packed small follicles lined by cuboidal epithelium with pale staining nuclei and round inconspicuous nuclei enclosed in acompletely enveloped thin fibrous capsule associated with scattered degenerative changes figure(9).

In the case of medullary carcinoma, sections show solid proliferation of mixtures of round, polygonal and spindle cells arranged in nests and cords associated with low mitotic figures separated by a highly vascular and hyalinized collagen stroma.

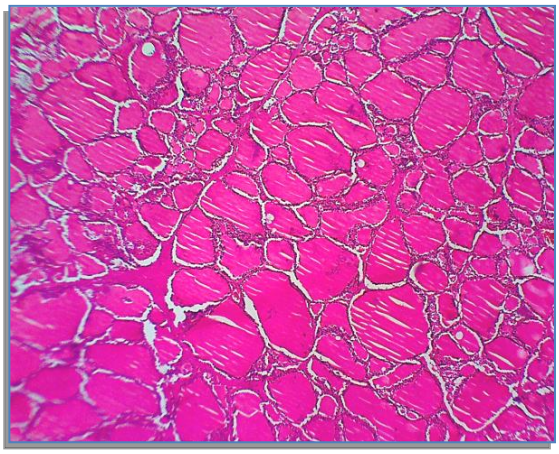

Figure 1. Photomicrographs of thyroid gland in individuals with non toxic goiter. (H&E4X)

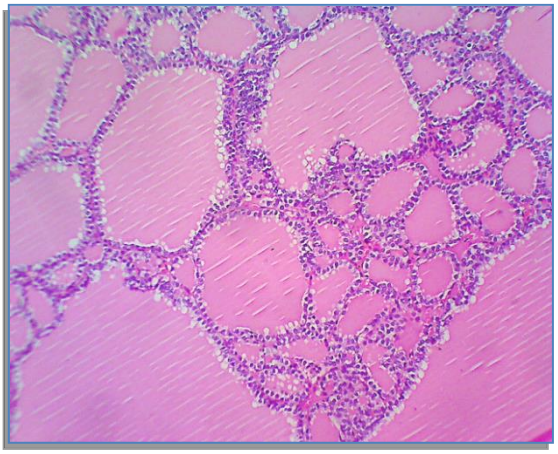

Figure 2. Photomicrographs appearance of thyroid gland in individuals with toxic goiter. (H&E4X)

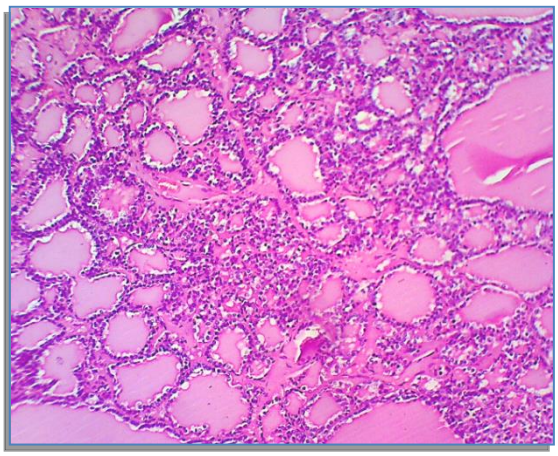

Figure 3. Photomicrographs of thyroid gland in individuals with toxic goiter. (H&E4X)

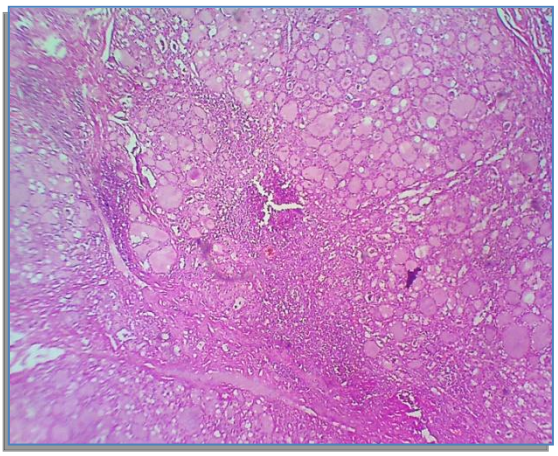

Figure 4. Photomicrographs of thyroid gland in individuals with Hashimoto thyroiditis (H&E4X)

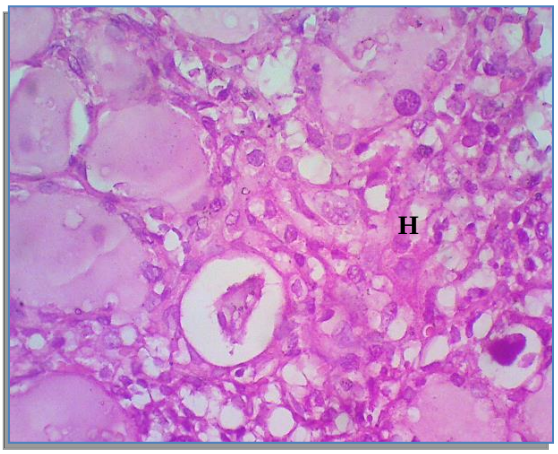


Figure 5. Photomicrographs of thyroid gland in individuals with Hashmoto thyroiditis show the hurthel cell **H**. (H&E 40X)

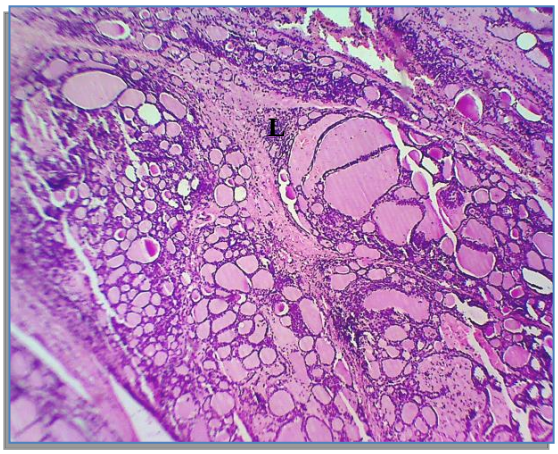


Figure 6. Photomicrographs of thyroid gland in individuals with lymphocytic thyroiditis show the lymphocyte infilteration **L(**H&E4X).

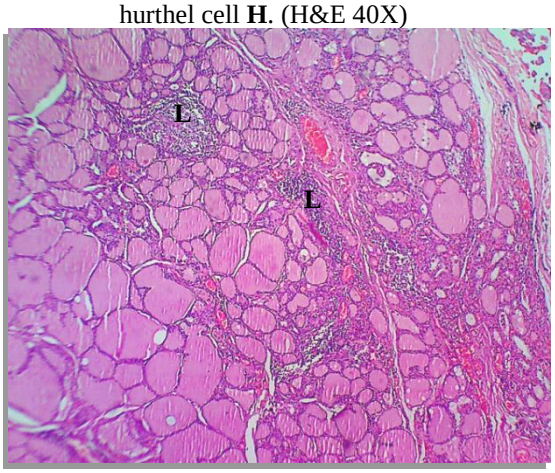


Figure 7. Photomicrographs of thyroid gland in individuals with focal lymphocytic thyroiditis show the focal lymphocyte aggregation. **L**(H&E10X).

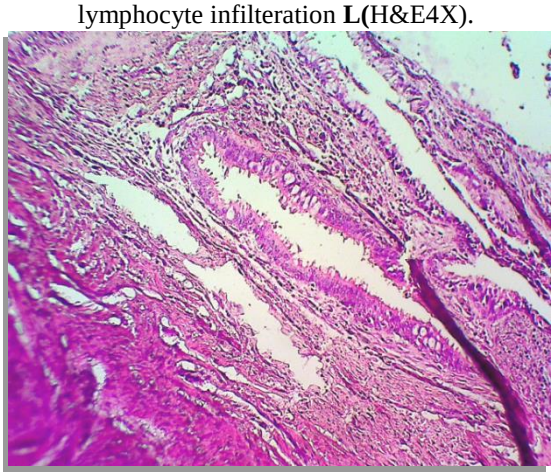

Figure 8. Photomicrographs of thyroid gland in individuals with thyroglossal cyst. (H&E10X).

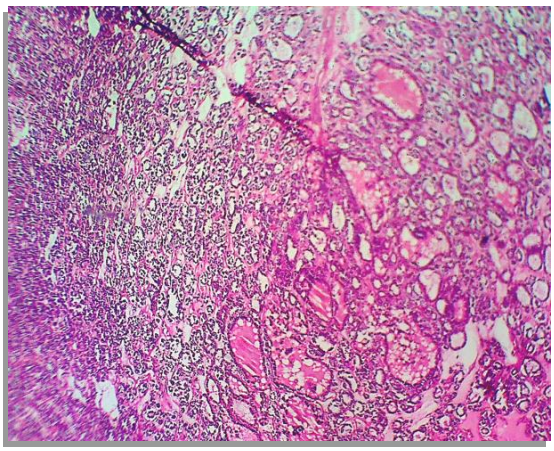

Figure 9. Photomicrographs of thyroid gland in individuals with follicular adenoma. (H&E4X).

## Discussion

In our research the age of the individuals extend from 1 to 70 years. The top hesitancy of the individuals were in the fourth decade (n=16; 34.78%), followed by third decade (n=11; 23.91%).The larger number of the thyroid defects (n=27; 58.69%) were noticed in the age group 30-49 and 40-49 years. The small number of age group (70-79 years) (n=1;2.17%).

This study was in agreement with other previous research that showed the age of the individuals extend from 1to 74 years with an average age 35.57 ± 12.65 years. The larger number of the thyroid diseases (n=86; 79.63%) were noticed from 21 to 50 years. The age of young series (<20 years) and the age of old seies over 60 years formed 2.78% and 10.19%Consecutively (Rahman et al ,2013).

Regarding to the gender, the present study demonstrated that there were38 (82.60%) females and 8 (17.39%) males the ratio of female to male about 4.75 :1.

This study agreed with another study that noticed that thyroid diseases is more common in females approximately (80.5%) than males (19.5%) (Tsegaye & Ergete, 2003).The other studies confirmed that (Gitau, ,1975;Kungu, 1974; Mekones, 1996;Wolde-Gebriel , Demeke , West , &van der Haar ,1993). Also another study certained that thyroid diseases have been occurred in female more than male (Bokhari & Sadiq 2008)**.**

Depending on non neoplastic and neoplastic biopsies, the current paper found that the hesitancy of non-neoplastic and neoplastic biopsy cases is about82.6%and 17.3%. The non-neoplastic cases are popular in 3rd to 5th decades in females in contrast to males. **.**

The present paper confirm other studies that notice that non neoplastic lesions were about 82.85% and neoplastic lesions about 17.14% cases (Abdul Ghafoor, Sajjad, Akram,& Khan,2015)**.**

In the type of non toxic goiter**,** this research demonstrated that the non toxic goiter is prevalent in the age between**(**30-39**)** and **(** 40-49)years in percentage 56.5%.

This results is lower than the previous study found that Nodular colloid goiter consider prevalent defect like it was found in approximately 600(76.9%) of biopsies in their research.

The grade of the increase in the size of thyroid is commensurate to the period and level of the thyroid hrmon reduction. In the majority of specimen the elevated thyroid mass fulfill euthyroid condition( Tsegaye & Ergete ,2003).Colloid goiter was the most common lesion, compute as 56.5% of all thyroid lesions and 68.4% of all non-neoplastic lesions. This high hesitancy was also confirm by others. (Adeniji, Anjorin, &Ogunsulire , (1998;Bokhari & Sadiq, 2008; Imran, Majid, Khan,2005;Tsegaye & Ergete ,2003) **.**

In the type of toxic goiter, we found this type of disease in 4cases (8.69%).Other studies performed by Hussain et al found 0.91% of cases (Hussien, Anwar, Nadian ,& Zulfiq, 2005 **).**

In the present study, out of the 46 cases studied, inflammatory lesions group contained 5 patients (10.86 %). Of these, the most dominant inflammatory lesion was Hashimoto and focal thyroiditis (40%) and lymphocytic thyroiditis (20%).

Our research was in agreement with another research that confirmed that out of the 100 specimens studied, inflammatory lesions' group contained 8 cases (8.0 %) (Monika, Meena, &Sayajirao, 2018) **.**

Hashimoto thyroiditis included of 4.34% of total cases, all being females. Our results was inagreement in another research that demonstrate the percentage is approximately 2.6% of whole biopsies and all being females (Abdul Ghafoor, Sajjad, Akram & Khan Z.A, 2015).

The low hesitancy and the female sex tendency over males in thyroiditis were also confirm by other studies. (Kumar, Abbas, Fausto ,& Aster, 2010;Tsegaye & Ergete, 2003)**.** Where is our results HT was diagnosed in three to fourth decades.

This result was inagreement with another reseach that confirmed that (HT) which is an autoimmune inflammatory defect diagnosed by prevalent fibrosis, lymphocyte cell infiltration, oxyphilic changes and thyroid

cell atrophy that influence of about 5% of the individuals but is appeared in the 4th to 6th decennium and is about 15 once more prevalent in female (Cipolla et al,2005).

The results of this study notice the thyroglossal cysts in three (6.52%)cases. The current research was in resumble with other research which demonstrated that the disease appear in four patients (3.7%) of thyroglossal duct cyst were found (Rahman et al,2013).

In the adenoma type ,the current study of was demonstrated in 15.2% of individuals. Our results was in agreement with other study that found the benign tumor example, adenoma were noticed in about 100 (12.8%) biopsies (Tsegaye & Ergete, 2003),and also found that the hesitancy of follicular adenoma is more than the hesitancy of cancers **(**AL Bouq, Fazili , &Gaffar,2006; Tsegaye & Ergete, 2003 **).**

The present study also found that females are so prevalent influenced than the males this results was match with other previous study( Abdulkareem, 2010; Salama, Abdullah, Al-Qahtani, &Al-Maghrabil 2009).
In cancer style, there is a relatively decrease widespread of thyroid malignancy (TM) was notice about 2% (1/46) of only medulary carcinoma.

A study found that medullary thyroid carcinoma (MTC) involves 5 – 10% of whole this organ cancers. The average age at coming is 50 years (Salama, Abdullah, Al-Qahtani, &Al-Maghrabil 2009) **.** This is in harmony to our study in which MTC involves 2.17% with average age of 54.5 years, which may refers that our case were intermittent styles**.**

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