

## **Malignant Goiter: A Retrospective Study from Saudi Arabia**

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**Abstract— Background:** Increase in the frequency of malignant thyroid neoplasms is currently so pronounced among the Saudi Population. **Aim:** This five-year retrospective study was performed to report a holistic view about malignant goiter in a local district of Saudi Arabia. **Patient and Methods:** Five-year retrospective study took place from December 2015 to January 2020. Patients' records were reviewed to distill their sociodemographic, clinical presentation, nature of surgery and the glandular pathological results. **Results:** A total of 72 patients underwent surgery. The female to male ratio was found to be 3.8:1 (49 females and 23 males). Patients' age ranged from 16 to 74 year with the mean of  $41.2 \pm 12.4$  (mean  $\pm$  SD). The commonly encountered carcinoma was of the papillary type in 56 patients (77.7%) while the remaining 16 showed follicular carcinoma in 12 (16.7 %) and 4 (5.5 %) presented with lymphoma. **Conclusion:** Thyroid cancer is apparently increasing among the studied sample. This need further investigations for an accurate elaboration of the cause, the commoner thyroid malignancy in the current study setting was papillary cancer compared to follicular malignancy and lymphoma. Although the sample size of this retrospective study may not be so accurate to highlight the problem it may raise the necessity of having further prospective studies on larger cohort.

**Key words:** Goiter, malignancy, follicular carcinoma, papillary carcinoma, lymphoma

### **Introduction:**

Endocrine malignancies have apparently increased within the last two decades, notably Thyroid malignancy<sup>1</sup>. Thyroid cancer is reported to consume 8.8 % of the whole malignancies among Saudi population. Nonetheless, it constitutes 12% of the female cancers nationwide. The record denotes a higher female incidence of this malignancy compared to their male counterparts (ratio 1: 0.3)<sup>2,3</sup>. Thyroid cancer is reported to be 5.4 % of all the recently diagnosed malignancies in Saudi Arabia.<sup>4,5</sup>

it is locally ranked as the second frequent cancer among females compared to a rank of 13 among male. This type of malignancy is locally stated to have a relative earlier presentation age among females in contrast to males. Papillary is the commonest reported histopathological type<sup>6</sup>.

Within the Gulf Cooperation Council (GCC) countries it is considered as the fifth commonly recorded malignancy. Overall, it ranks as the second common female malignancy among the GCC nationals<sup>7</sup>.

Carcinoma of the thyroid may be presented as a solitary nodule or diffuse glandular enlargement. Sometimes, it may manifest with compression symptoms such as dysphagia or even dyspnea as well as clinical manifestations of hyperthyroidism. However, most patients showed asymptomatic nodules without any thyrotoxicosis<sup>9,10</sup>.

Many tools are used for treating Thyroid malignancies. They include radical glandular excision, hormonal replacement therapy as well as radioactive ablation<sup>9</sup>. Currently extra therapeutic options are adopted with the aim of aborting the mutation pathways and regulating the intranuclear gene<sup>11</sup>. The current five-year

retrospective study was performed to report a holistic view about malignant goiter in a local district of Saudi Arabia. The study was done in two centers; secondary and tertiary care hospitals aiming to collect the preoperative, clinical and histopathological presentation, operative data as well as the post-operative course and pathology in all the studied samples.

### **Patient and Methods:**

An ethical approval was given by our institutional research board (IRB). A five- year retrospective study was carried out during the period from December 2015 to January 2020. All patients with malignant goiter were included. Their files were meticulously studied to record their sociodemographic data including gender, age, and country of origin, occupation and residency place. Their clinical data were also thoroughly studied such as the glandular enlargement, mode of presentation, endocrinal symptoms, histopathological results of the Fine Needle Aspiration Biopsy (FNAB) as well as any encountered comorbidity/surgical data were also highlighted including the used surgical technique, nature and shape of the tumor and lymph node metastasis to settle the TNM staging system. We also reported the pre- and post-operative glandular histology and vascular involvement. Follow up study data were reported with a special emphasis for any re surgery and/or radio iodine treatment.

### **Results:**

The record of 72 patients were evaluated during in five-year study period. Saudi nationals constituted 68 patients (94.4%). The female to male ratio 3.8:1 (49 females and 23 males). Patients' age ranged from 16 to 74 year with the mean of  $41.2 \pm 12.4$  (mean  $\pm$  SD). Most cases clinically presented as a Solitary thyroid nodule in about 78% of cases. However, the remaining 22% presented as swelling that occupied the whole gland. The commonly encountered carcinoma was of the papillary type in 56 patients (77.7%) while the remaining 16 showed follicular carcinoma in 12 (16.7 %) and 4 (5.6 %) presented with lymphoma. Yet, no other histopathological types of malignancy were encountered.

The mean age was  $34.4 \pm 11.7$  (mean  $\pm$  SD). More than two thirds (48 %) of patients were between 21 years and 40 years. (Table 1).

All Saudi patients were originally from, and living in Al-Ahsa area without any predilection to any specific village or town. Forty percent (29/72) of malignancies were from the northern part of Al-Ahsa, with a significant percentage from Al-Battalia village.

FNAC initially showed 64 patients (89 %) to be malignant (Bethesda category VI) Fig. 1 & 2. Yet, 6 patients (8%) were suspicious for malignancy (Bethesda category V) and 2 patients (3 %) showed atypia (Bethesda category III).

Solitary thyroid nodules (STN) were the most common presentation among the total 72 studied patients with a percentage of 78 % while the remaining 22 % were having diffuse swellings.

Post-operative findings showed papillary carcinoma to be found in 56 (77.8%) Fig.3, follicular carcinoma in 12 (16.7%) Fig 4. and lymphoma in 4 (5.5%). There were no medullary or anaplastic tumors (table 2.)

Bilateral near total thyroidectomy was the primary procedure in 26 (36.1%) patients while hemithyroidectomy (total lobectomy) was performed in 26 (36.1%) patients. Total thyroidectomy was done in 20 (27.8%) patients. (Table 4)

During surgery, systematic compartment orientated selective nodal Dissection was done in case lymph node involvement. (Table 5)

The mean follow-up period was 8 months with a range from one up to 60 months. Thirty-eight patients (52.7%) had a follow up for one year, 22 patients (30.6%) between one and three years, and twelve patients (16.7 %) between three and five years. (Table 6)

The pre- and post-operative FNAC results are shown in charts 1 & 2, respectively.

### **Discussion:**

Pathology of thyroid gland compromise a considerable percentage of patients of the family health clinic through the Kingdom of Saudi Arabia. Nevertheless, thyroid cancer constitutes the commonest malignancy among the different endocrinal systems. It does have a different incident rates global wise. Currently, an increase in its incidence with many pathological changes is reported disorders constitute one of the common chronic diseases<sup>13</sup>.

Papillary thyroid carcinoma was the highly encountered malignancy in the current study compared to the follicular type and lymphoma that proved to be less frequent. These results are supported by similar data from the same setting<sup>14, 15</sup>. A study reported papillary carcinoma to have an incidence of 82.2% and follicular carcinoma to be 4.4 % among thyroid malignancies. This report supports our current data, although it showed a lower frequency in incidence of follicular cancer<sup>15, 16</sup>. Incidence of papillary carcinoma was reported as 77.8 % among our patients. This simulated a previously published study that denoted an incidence 82.2%. On the other hand, the current percentage of follicular carcinoma was 4.4 % that constitutes about half of the percentage in another study (8.3%)<sup>15</sup> overall the current study percentages of both papillary and follicular malignancy were coinciding with other reports from similar settings within the same nation<sup>16, 17</sup>.

Although we did not investigate either the etiology, familial tendency, endemic goiter or radiation exposure among our patients' studied data, females proved to have a higher thyroid cancer compared to males in a ratio of 5:1. Such data proved to be identical to similar reports<sup>18</sup>.

Other studies denoted a higher male prevalence among malignant thyroid patients. It may be due to the different ethnicity of the reported patients who were not mostly Saudi. Moreover, most reported cases were males. Therefore, this data may not be realistic<sup>19, 20</sup>.

The current study revealed a relatively younger age of patients (34.4 years) which is lower than many other reports<sup>18-20</sup>. This discrepancy may be due to variations in the epidemiology and clinical behavior of the disease pathology all over the world<sup>21</sup>. It has been widely published that the age at discovery of thyroid cancer has a higher influential impact of the disease plus other parameters like the tumor size, histology, extension, lymph node affections as well as the adopted surgical technique. Met analytic reports stated many effective factors to anticipate the prognosis. These include the age, lump size and the extent of metastasis<sup>22, 23</sup>. Contrary, other prognostic factors may include the advancement of patient age that are proved to be of paramount importance as regards the aggressive pathologies among elderly<sup>24, 25</sup>.

Solitary thyroid nodules were the mostly encountered pathology among our series of thyroid cancer coinciding with other literature<sup>26</sup>. Yet, others reported a higher percentage of malignant thyroid swellings among patients with multi nodular goiter (66.7%)<sup>18</sup>.

The current study revealed FNAC to be an effective of elucidating thyroid malignancies in 80% of patients, simulating previous data<sup>18, 27</sup>. Nonetheless, patients with negative FNAC showed thyroid malignancy within their post-operative histological assessment.

### **Conclusion:**

It may be concluded that malignancy of the thyroid gland does have the most common frequency among the endocrinal malignancy on our setting similar to the global data.

FNAC has a higher reliability in diagnosis of thyroid cancer. Hence, it should be adopted as the initial maneuver for screening of malignancy among patients with thyroid enlargement. The current study has some limitations as per the number of studied sample as well as being a retrospective type. Extra prospective studies as well as met analytic reports might be needed to portrait a b better realistic view about thyroid malignancy within the current setting.

### **Table legends:**

Figure 1. FNA Papillary carcinoma

Figure 2. FNA Follicular carcinoma

Figure 3. Post-operative histopathology papillary carcinoma

Figure 4. Post-operative histopathology Follicular carcinoma

Table 1. Age distribution

Table 2. Different pathological types

Table 3. TNM Staging

Table 4. Initial surgical procedures

Table 5. Management of cases with lymph node metastasis

Table 6. Follow up period

Chart 1: Preoperative FNAC chart

Chart 2: Post-operative histopathology

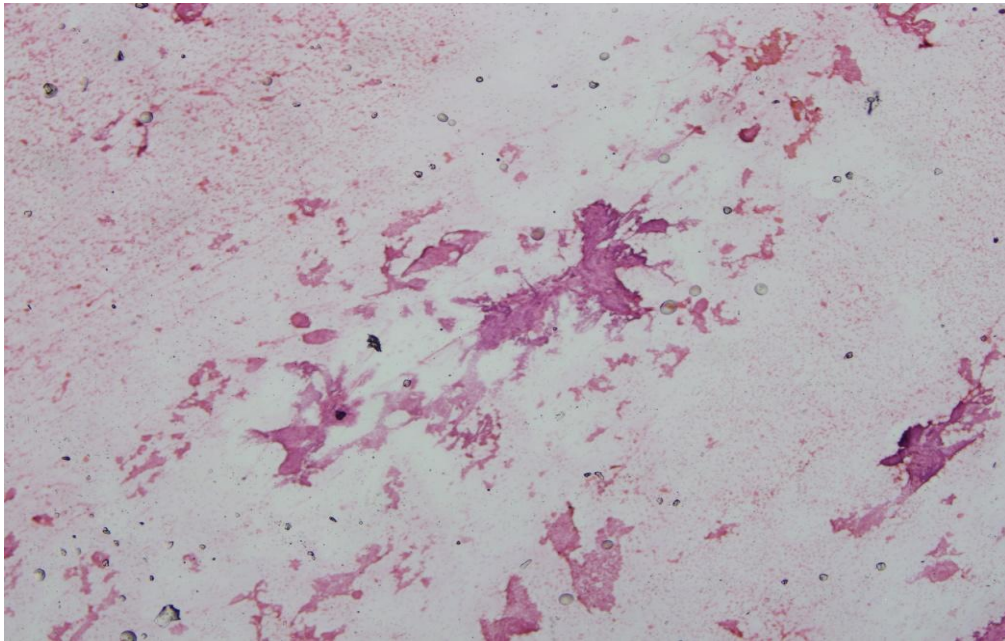


Figure 1: Papillary carcinoma – 60-year-old female cytology aspirate 40x H&E

Smear of Thyroid aspirate show predominantly Hypercellular smears composed of syncytium like sheets of cohesive clusters of cells with papillary configuration, fragments with fibrovascular core at places. There is nuclear crowding, overlap with nuclear enlargement and chromatin clearing.

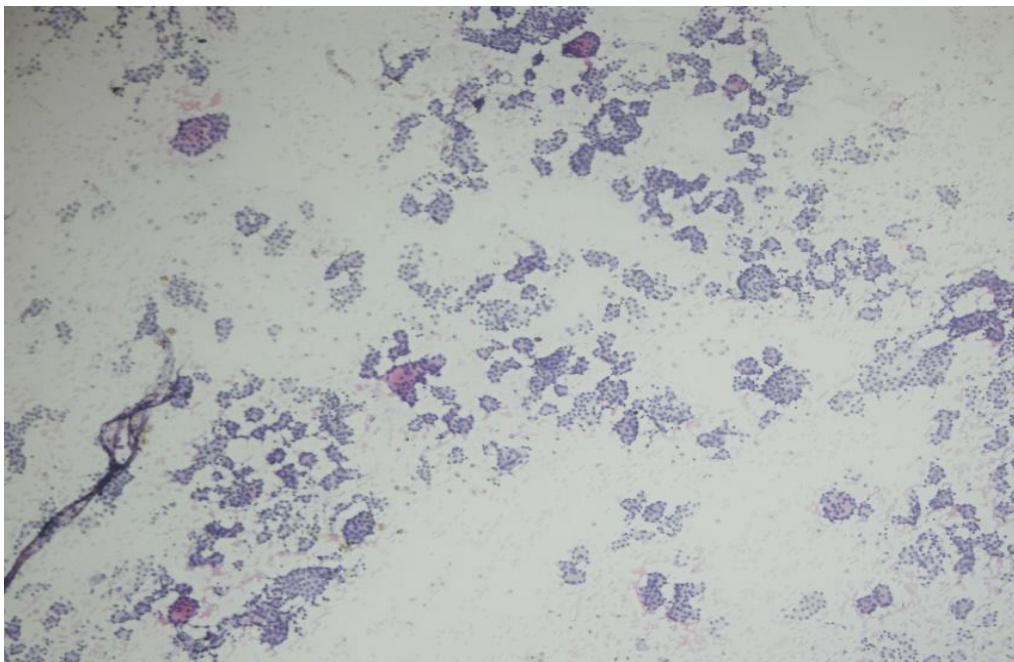


Figure 2: Follicular carcinoma – 39-year-old female cytology aspirate 40 x H&E

Smear of Thyroid aspirate show predominantly cellular aspirate of follicular cells in clusters, microfollicular and scattered pattern. The cells show slight variation in size, mild atypia and overlapping with crowded as well as scattered single cells. The background shows lack of colloid.

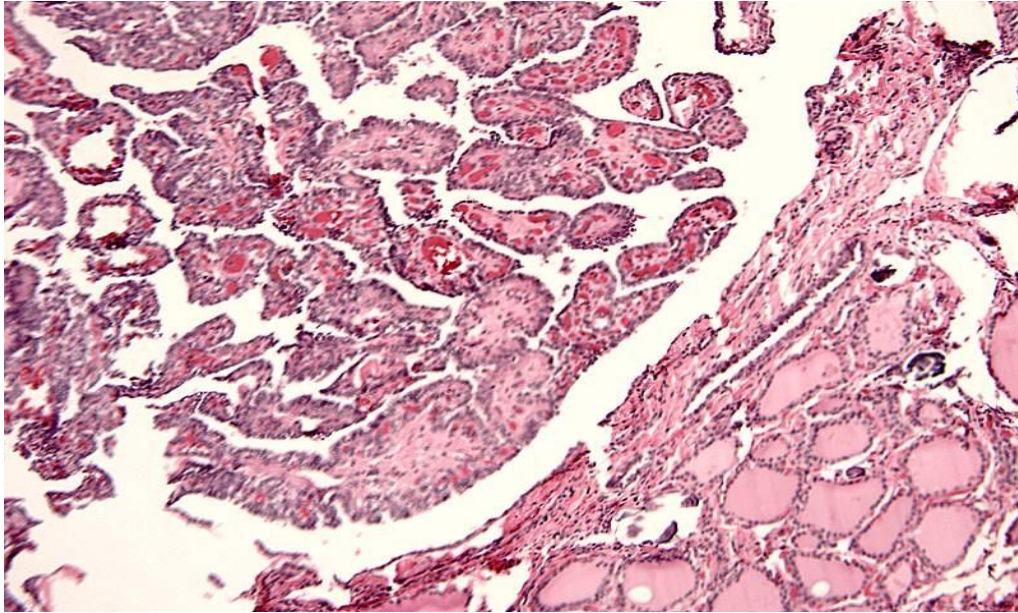


Figure 3: papillary carcinoma – 46-year-old male -post operative histopathology

Microscopy: Photomicrograph shows Thyroid tissue with focus of tumor predominantly arranged in papillary configuration. The papillary fronds are showing prominent, congested fibrovascular cores. The cells appear heaped up with features of nuclear clearing.

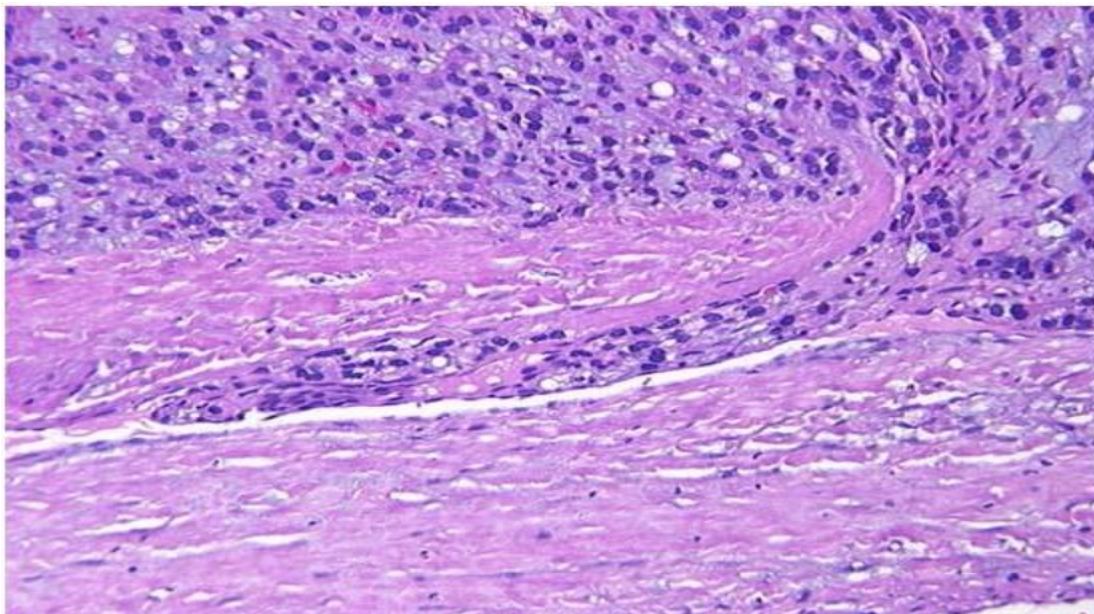


Figure 4: Follicular carcinoma – 62-year-old female -post operative histopathology

Microscopy: Photomicrograph showing Micro Invasive focus of capsular invasion by follicular tumor cells which are mainly microfollicular to solid sheets in arrangement into a thickened, fibrotic capsule.

Table 1.

Age Group	Number (Percentage)
Less than 20 years	03 (4.2%)
21 – 30 years	21 (29.2%)
31 – 40 years	27 (37.5%)
41 – 50 years	9 (12.5 %)
51 – 60 years	7 (9.7 %)
61 – 70 years	03 (4.2 %)
71 – 80 years	02 (2.7 %)

Females 49 (68%) Males 23 (32%)

Table 2.

Pathology	Number (Percentage)
Papillary carcinoma	56 (77.7 %)
Follicular carcinoma	12 (16.7%)
Anaplastic carcinoma	0 (0%)
Medullary carcinoma	0 (0%)
Lymphoma	04 (5.6%)
Total	72 (100%)

Table 3.

Tis	T1	T2	T3	T4	N I	N II	N III	M0	M1
05 (6.9%)	35	09	06	00	8	3	6	00	00

	(48.6 %)	(12.5%)	(8.3%)		(11.1 %)	(4.2 %)	(8.3 %)		
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Table 4.

Primary operation	Number (Percentage)
Bilateral Near total thyroidectomy	26 (36.1%)
hemithyroidectomy (total lobectomy)	26 (36.1%)
Total Thyroidectomy	20 (27.8 %)
Total	65 (100 %)

Table 5.

compartment orientated selective nodal Dissection	17 (23.6 %)
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Table 6.

Less than 12 months	38 (52.7 %)
12 – 36 months	22 (30.6 %)
36 – 45 months	10 (13.8 %)
45 – 60 months	2 (2.7 %)

Chart 1:

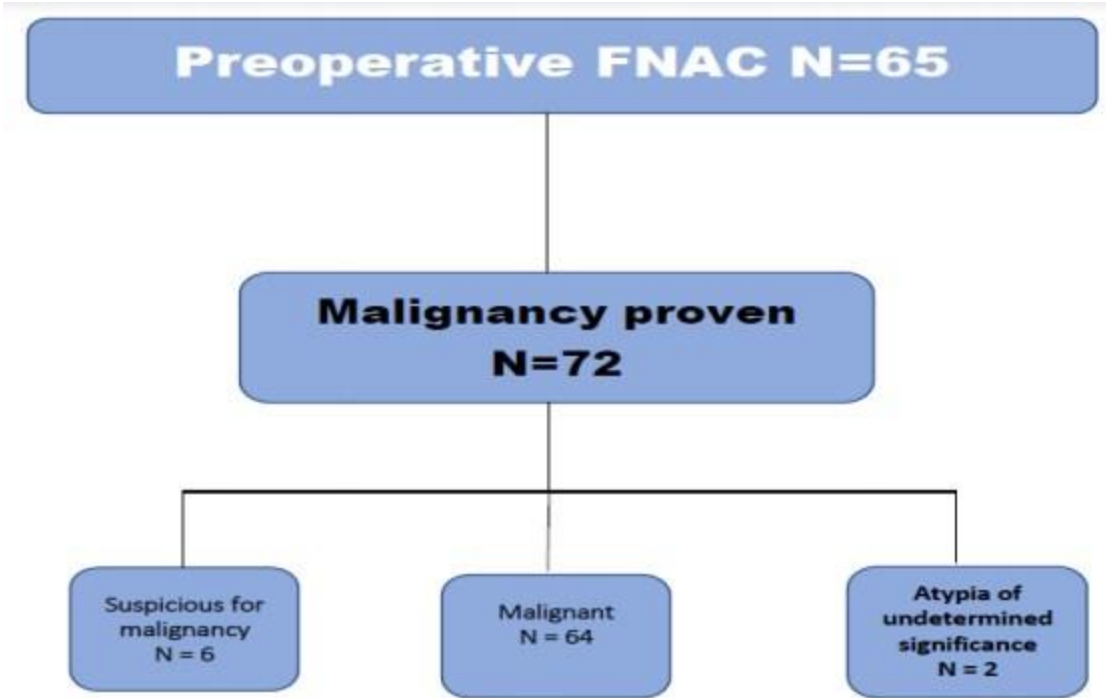
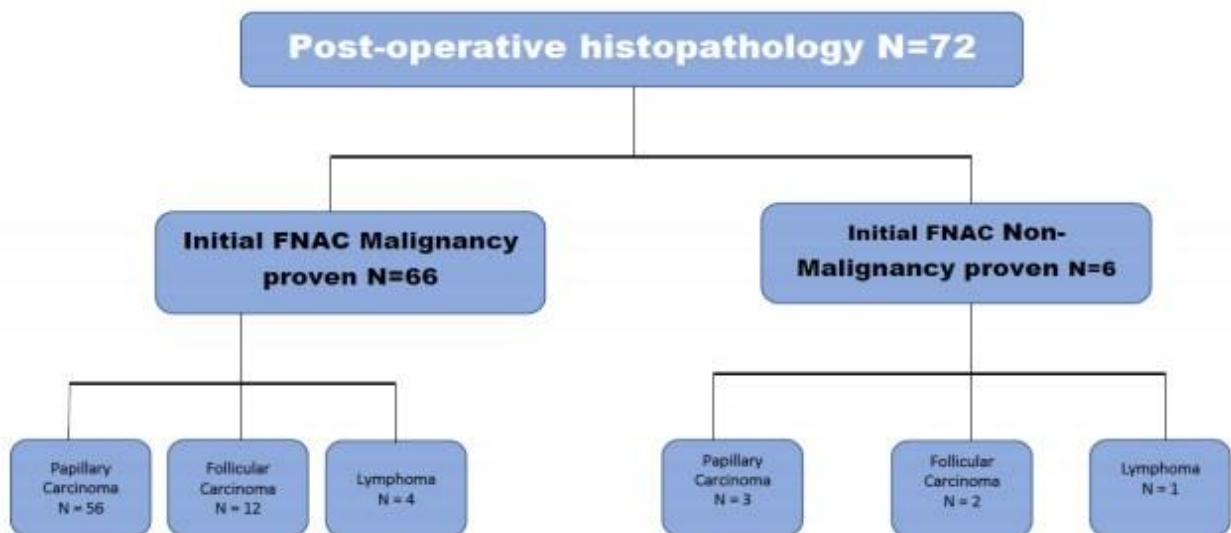


Chart 2:



**Declarations:****Ethics approval and consent to participate**

Experiments were conducted after obtaining the institutional researchers' board (IRB) of college of Medicine, King Faisal University Ethical approval number 33-11-46RSR on the manuscript.

**Consent for publication**

We authorize the journal for publication of identifying images or other personal or clinical details of participants that compromise anonymity. (Not applicable)

**Availability of data and material**

All data and material are available upon request

**Competing interests**

The authors declare that there is no compete or conflict of interests regarding the publication of this article.

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