

PROFILE AND PATTERN OF HISTOLOGY SPECIMEN OF THYROIDECTOMY PATIENTS OPERATED IN MANKWENG HOSPITAL, LIMPOPO PROVINCE, SOUTH AFRICA

Mirza M. Z. U. Bhuiyan

Department of General Surgery, Mankweng Hospital, University of Limpopo, Turfloop, Sovenga, Limpopo, South Africa

E-mail: bhuiyanmirza@gmail.com

ORCID: <https://orcid.org/0000-0002-0406-6563>

Bhuiyan, M. M. Z. U. (2023). Profile and pattern of histology specimen of thyroidectomy patients operated in Mankweng hospital, Limpopo province, South Africa. *ScienceR* 3, 3–8. doi: <http://doi.org/10.21303/2313-8416.2023.002962>

ARTICLE INFO

Article history:

Received date 12.05.2023

Accepted date 20.06.2023

Published date 30.06.2023

Section:

Practical medicine

DOI

10.21303/2313-8416.2023.002962

KEY WORDS

Thyroidectomy
Multinodular goitre
Endocrine
Thyroid cancer
Ultrasound
Nuclear scan
FNAC

ABSTRACT

Object of study: To evaluate the histopathologic pattern of the thyroidectomy specimen in patients with goitre who underwent thyroidectomy operation at Mankweng Hospital and to review the profile of thyroid disease in relation to the age, gender & Distribution of thyroid disease which are referred to Mankweng hospital from the districts of Limpopo Province.

The problem to be solved: The demographic profile of thyroidectomy patients in this hospital is identified. Hence outreach program can be initiated according to demographic profile.

Main scientific results: Total of 62 patients analyzed: male 2, female 60. Age range 15–70. District: Capricorn 23, Sekhukhune 33, Mopani 6. Histology: 62: Multinodular goitre 47, Papillary carcinoma 5: Hurtle cell carcinoma 3, colloid goitre 2, Diffuse colloid goitre 1, Cavernous haemangioma 1, follicular neoplasm 1, Hashimoto's Thyroiditis 1, benign thyroid parenchyma with cyst 1

The area of practical use of research results: General surgery department in Regional & Tertiary hospital.

An innovative technological product: Patient demographic profile for health outreach program.

Scope of application of an innovative technological product: General surgery department.

© The Author(s) 2021. This is an open access article under the Creative Commons CC BY license

1. Introduction:

1. 1. Object of study

To evaluate the histopathologic pattern of the thyroidectomy specimen in patients with goitre who underwent thyroidectomy operation at Mankweng Hospital and to review the profile of thyroid disease in relation to the age, gender & Distribution of thyroid disease which are referred to Mankweng hospital from the districts of Limpopo Province.

1. 2. Description of the problem:

The disease of thyroid gland is one of the most common endocrine disorders worldwide in clinical practice. Main diseases of thyroid are simple goitre (diffuse and nodular), thyroiditis and neoplasms associated with hypothyroidism, hypothyroidism or euthyroid. The incidence of thyroid disease has been rising in recent decades. Worldwide, thyroid nodules have been reported in 4–7 % of the population on neck palpation and in 30–50 % when investigated by ultrasonography and these lesions are often caused by iodine deficiency [1–3].

Follicular carcinoma, while relatively less frequent, is reported to be more common in iodine-deficient areas where Multinodular goitre (MNG) is endemic [4, 5]. Excess iodine is associated with the development of Papillary thyroid carcinoma (PTC) and anaplastic thyroid cancer [6]. Ultrasound and nuclear scanning are common imaging done for Thyroid diseases along with Thyroid Function Test (TFT), which include Thyroid Stimulating Hormone (TSH), triiodothyronine (T3) & thyroxine (T4) to appreciate the functional status of thyroid gland.

Fine needle aspiration Cytology (FNAC) is considered diagnostic for benign thyroid diseases and malignant thyroid diseases except follicular neoplasm (follicular thyroid adenoma and

follicular thyroid carcinoma (FTC), which needs tissue diagnosis for demonstration of capsular and vascular invasion [7]. Histopathological investigation of thyroidectomy specimen is required for confirmation of the final diagnosis.

Thyroidectomy operation is the common endocrine surgical procedure. Most of the thyroid Patients present in surgical clinic with anterior neck mass. Thyroidectomy operation usually describe: Total thyroidectomy, Subtotal Thyroidectomy, or lobectomy with or without isthusectomy depending on the pathology. Mankweng hospital is one of the Tertiary academic hospitals in Limpopo province and cater the patient from Mopani, Sekhukune districts and some area of Capricorn district of Limpopo province of South Africa. Profile of thyroid patients referred to this hospital is not known. Main Objectives of the study was to evaluate the histopathologic pattern of the thyroidectomy specimen in patients with goitre who underwent thyroidectomy operation at Mankweng Hospital. Other objectives: To review the profile of thyroid disease in relation to the age, gender & Distribution of thyroid disease which are referred to Mankweng hospital from the districts of Limpopo Province, so that recommendation can be planned for outreach program according to the dispersal of the thyroid disease and to identify the correlation of Imaging report of ultrasound & nuclear scan with histology particularly thyroid carcinoma.

1. 3. Suggested way to solve the problem

Outreach programs need to focus on Sekhukhune district where majority of thyroid disease patients referring. Aim of the research to evaluate the histopathologic pattern of the thyroidectomy specimen in patients with goitre, who underwent thyroidectomy operation at Mankweng Hospital and to review the profile of thyroid disease in relation to the age, gender & Distribution of thyroid disease which are referred to Mankweng hospital from the districts of Limpopo Province

2. Materials and research methods

The study was a retrospective cross sectional descriptive quantitative design to analyze the profile of all patients with thyroid nodules who underwent thyroid surgery at Mankweng Hospital from January 2015 to December 2021.

Files of All patients who underwent thyroidectomy operation were reviewed, and cases where histological results were not available were excluded from the study. Data were collected from the theatre record, the National Health Laboratory Service, and the patient files. All Information was documented in a data collection sheet comprises of gender, age, main symptoms, district, pre-operative Investigations (Ultrasound, Nuclear scanning and FNAC), nature of operation (Left/Right Lobectomy, subtotal thyroidectomy, Total thyroidectomy) and histology type of post-operative specimen. Cytology reports were categorized as Bethesda classification [8]. The collected data was entered into Excel (Microsoft 2013, USA). The statistical software package Stata version (Stata Corp, USA) was used for data analysis. Continuous variables were expressed as mean and standard deviation. Categorical variables were described as proportions and frequency tables.

3. Result

Total of 62 patients were analyzed (Table 1). Indication for operation: Cosmetics – 50, compression symptoms – 10, suspicious malignancy – 2. Type of operation and histology pattern reflected in Tables 2, 3.

Table 1

Descriptive summary of nodular Thyroid patients who underwent surgery

Variables	Number (%)
1	2
Gender	
Males	2 (3.2 %)
Females	60 (96.8 %)
Age range 15–70	
<30	7 (11 %)
30–60	44 (71 %)
>60	11 (18 %)

Continuation of Table 1

1	2
Home district	
Capricorn	23 (37 %)
Mopani	6 (9.7 %)
Sekhukhune	33 (53 %)
Main symptoms	
Anterior neck mass	52
Anterior neck mass with compression	9
Anterior neck mass with hoarseness voice	1
Ultrasound Reports 29	
Multinodular goitre (MNG)	23
Nodule	4
Cystic	2
FNAC reports: 11	
Follicular neoplasm	2
Follicular cell	2
Benign colloid goitre	4
No malignant cell	3
Nuclear scanning reports: 30	
MNG	25
Toxic goitre	2
Simple diffuse goitre	1
High risk malignancy	1
Goitre retro sternal extension	1
Functional status: 62	
Euthyroid	56
Hyperthyroidism	5
Hypothyroidism	1

Table 2

Thyroid Operation performed: 62

Type of operation	Number (%)
Left lobectomy & Right lobectomy	37 (59.7 %)
Total Thyroidectomy	19 (30.6 %)
Subtotal Thyroidectomy	5 (8 %)
Thyroid debulking	1 (1.6 %)

Table 3

Histological type of Postoperative thyroidectomy specimens

Thyroid disease	Number (%)
Multinodular goitre (MNG)	47 (75.8 %)
Colloid goitre	2 (3.2 %)
Diffuse colloid goitre	1 (1.6 %)
Cavernous haemangioma	1 (1.6 %)
Mixed follicular neoplasm	1 (1.6 %)
Hashimoto's Thyroiditis	1 (1.6 %)
Benign thyroid parenchyma with cyst	1 (1.6 %)
Papillary carcinoma	5 (8 %)
Hurtle cell carcinoma	3 (5 %)

4. Discussion

Histology specimens of 62 patients, who underwent thyroidectomy operation in Mankweng hospital were reviewed. In this study the majority (97 %) of patients were females similar to oth-

er sub-Saharan Africa [9], presented predominantly with benign conditions. Main indication of operation was cosmetics reason and most of the operations performed were right and left lobectomy (n37;60 %), followed by Total thyroidectomy (n19;30 %) & subtotal thyroidectomy (n5;8 %). Usually, benign thyroid disorders are common condition and often affect younger females [9]. Most (71 %) of our patients were between 30-60 years age range group. Subtotal thyroidectomy/hemithyroidectomy are the surgical procedures most frequently performed [10, 11].

The approach to the surgical management of benign goitre is progressively becoming more radical owing to the risk of recurrent goitre [12] and the safety of surgery [13–15]. Furthermore, the incidence of thyroid malignancy ranges from 0.9 % to 20.5 % in different parts of the world [16, 17]. and re-operation for recurrent goitre following subtotal thyroidectomy is associated with a significantly increased risk of permanent recurrent laryngeal nerve injury.[15]

In this study multinodular goitre is the commonest pathology on histological specimens (n47:76 %) similar to the study Eleni et al reported [18]. The worldwide prevalence of MNG in the general population is estimated to be 4–7 %, and these lesions are often caused by iodine deficiency [1]. Thyroid cancer was found in this study 13 % of all reviewed specimens and papillary carcinoma are more prevalent. Globally, the most common thyroid cancer is papillary carcinoma [19, 20].

Ultrasound(US) is one of the common investigation done for thyroid nodular disease. However, no US findings are diagnostic to differentiate benign from malignant lesions [21]. In this study ultrasound reported MNG in 23 cases and 4 of these MNG turn out as Thyroid carcinoma in histology specimens. Incidental malignancy were found on the histology specimen where ultrasound reflect as multinodular goitre was 17 % and the risk of incidental carcinomas reported in the literature of 2–12 % [4, 16, 17, 19, 22–25]. Ultrasound features in isolation do not provide reliable information [26].

FNAC reports of our 11 patients described into categories 1–4 of the Bethesda classification [8]. On histological examination, these lesions were found to be non-malignant. The value of FNAC in thyroid cancers and thyroid nodules is well established [18, 27, 28]. It is known that the rate of false-negative results for FNAC ranges from 0.7 % to 2.2 % if ultrasound-guided FNAC is used [29, 30], and rate rising to 44.7 % without ultrasonography [31, 32].

Nuclear scan reported 25 MNG in this study from 30 scan. High risk malignancy reported in one case and turn out as carcinoma and 3 other cases where it was reflected as MNG but turn out carcinomas in histology specimens. Radioisotope investigations for malignant disease have an important role, but only if they are taken together with clinical findings and other investigations such as ultrasonography, FNAC, computed tomography, magnetic resonance imaging or positron emission tomography [17, 33].

More than half of our patients are from Sekhukhune district (53 %) followed by Capricorn (37 %) and very few (10 %) from Mopani district.

Research limitation: The present study was retrospective, and some patients had missing records. We also observed poor note-keeping and inability to trace patients' histology results and some investigations reports. We had to exclude those case from the study.

Prospects for further research. More research is encouraged to further guide our understanding and aid in the formulation of management protocols relevant to this population.

5. Conclusions

Multinodular goitres were the most common non-malignant conditions in this study (76 %). The occurrence of thyroid cancer is 13 %, and papillary carcinoma are more common.

Incidental carcinomas were found in 17 % within multinodular goitre on histology specimen where ultrasound reflected as multinodular goitre.

Outreach programs need to focus on Sekhukhune district of Limpopo province where majority of thyroid disease patients referring.

Conflict of interest

The authors declare that there is no conflict of interest in relation to this paper, as well as the published research results, including the financial aspects of conducting the research, obtaining and using its results, as well as any non-financial personal relationships.

Funding

The study was performed without financial support.

Data availability

Data will be made available on reasonable request

References

- [1] Bron, L. P., O'Brien, C. J. (2004). Total thyroidectomy for clinically benign disease of the thyroid gland. *British Journal of Surgery*, 91 (5), 569–574. doi: <https://doi.org/10.1002/bjs.4507>
- [2] Pang, H.-N., Chen, C.-M. (2007). Incidence of Cancer in Nodular Goitres. *Annals of the Academy of Medicine, Singapore*, 36 (4), 241–243. doi: <https://doi.org/10.47102/annals-acadmedsg.v36n4p241>
- [3] Belfiore, A., La Rosa, G. L., Padova, G., Sava, L., Ippolito, O., Vigneri, R. (1987). The frequency of cold thyroid nodules and thyroid malignancies in patients from an iodine-deficient area. *Cancer*, 60 (12), 3096–3102. doi: [https://doi.org/10.1002/1097-0142\(19871215\)60:12<3096::aid-cnrcr2820601240>3.0.co;2-v](https://doi.org/10.1002/1097-0142(19871215)60:12<3096::aid-cnrcr2820601240>3.0.co;2-v)
- [4] Bombil, I., Bentley, A., Kruger, D., Luvhengo, T. E. (2014). Incidental cancer in multinodular goitre post thyroidectomy. *South African Journal of Surgery*, 52 (1), 5–9.
- [5] Woodruff, S. L., Arowolo, O. A., Akute, O. O., Afolabi, A. O., Nwariaku, F. (2010). Global variation in the pattern of differentiated thyroid cancer. *The American Journal of Surgery*, 200 (4), 462–466. doi: <https://doi.org/10.1016/j.amjsurg.2010.03.009>
- [6] Nettore, I., Colao, A., Macchia, P. (2018). Nutritional and Environmental Factors in Thyroid Carcinogenesis. *International Journal of Environmental Research and Public Health*, 15 (8), 1735. doi: <https://doi.org/10.3390/ijerph15081735>
- [7] Karunakaran, P., Devadas, G. (2020). Histopathological pattern of thyroid diseases and its correlation with post-thyroidectomy hypocalcemia: a prospective study in iodine-sufficient Southern India. *International Surgery Journal*, 7 (11), 3749–3754. doi: <https://doi.org/10.18203/2349-2902.isj20204684>
- [8] Cibas, E. S., Ali, S. Z. (2009). The Bethesda System for Reporting Thyroid Cytopathology. *American Journal of Clinical Pathology*, 132 (5), 658–665. doi: <https://doi.org/10.1309/ajcpplwmi3jv4la>
- [9] Sidibé, E. H. (2007). Thyroid diseases in sub-Saharan Africa. *Sante*, 17 (1), 33–39.
- [10] Saaq, M., Shah, S. A., Zubair, M. (2013). Clinical audit of the presentation and outcome of benign thyroid disorders in a tertiary care setting in Pakistan. *Journal Pakistan Medical Association*, 63 (9), 1172–1175.
- [11] Hossain, M. M., Haque, M. R., Rashid, A. et al. (2002). Surgical management of thyroid diseases – a study of 78 cases. *Myensingh Medical Journal*, 11 (1), 6–8.
- [12] Schmitz-Winnenthal, F. H., Schimmack, S., Lawrence, B., Maier, U., Heidmann, M., Buchler, M. W., von Frankenberg, M. (2011). Quality of life is not influenced by the extent of surgery in patients with benign goiter. *Langenbeck's Archives of Surgery*, 396 (8), 1157–1163. doi: <https://doi.org/10.1007/s00423-011-0822-7>
- [13] Gál, I., Solymosi, T., Lukács-Tóth, G., Wéber, G. (2013). A total thyreoidectomy hatásossága és biztonságossága a jóindulatú multinodularis golyvák kezelésében. *Magyar Sebészet*, 66 (5), 245–249. doi: <https://doi.org/10.1556/maseb.66.2013.5.3>
- [14] Rudolph, N., Dominguez, C., Beaulieu, A., De Wailly, P., Kraimps, J.-L. (2014). The Morbidity of Reoperative Surgery for Recurrent Benign Nodular Goitre: Impact of Previous Unilateral Thyroid Lobectomy versus Subtotal Thyroidectomy. *Journal of Thyroid Research*, 2014, 1–6. doi: <https://doi.org/10.1155/2014/231857>
- [15] Barczyński, M., Konturek, A., Hubalewska-Dydejczyk, A., Gołkowski, F., Cichoń, S., Nowak, W. (2010). Five-year Follow-up of a Randomized Clinical Trial of Total Thyroidectomy versus Dunhill Operation versus Bilateral Subtotal Thyroidectomy for Multinodular Nontoxic Goiter. *World Journal of Surgery*, 34 (6), 1203–1213. doi: <https://doi.org/10.1007/s00268-010-0491-7>
- [16] Najum ul Haq, R., Ali Khan, B., Ahmed Chaudhry, I. (2009). Prevalence of malignancy in goiter – a review of 718 thyroidectomies. *Journal of Ayub Medical College Abbottabad*, 21 (4), 315–321.
- [17] Czepeczyński, R. (2012). Nuclear medicine in the diagnosis of benign thyroid diseases. *Nuclear medicine in Central and Eastern Europe*, 15 (2), 113–119.
- [18] Efreimidou, E. I., Papageorgiou, M. S., Liratzopoulos, N., Manolas, K. J., (2009). The efficacy and safety of total thyroidectomy in the management of benign thyroid disease: a review of 932 cases. *Canadian Journal of Surgery*, 52 (1), 39–44.
- [19] Hanumanthappa, M. B., Gopinathan, S., Rithin, S. et al. (2012). Incidence of malignancy in multi-nodular goitre: A prospective study at a tertiary academic centre. *Journal of Clinical and Diagnostic Research*, 6 (2), 267–270.
- [20] Pisanu, A., Reccia, I., Nardello, O., Uccheddu, A. (2009). Risk Factors for Nodal Metastasis and Recurrence Among Patients with Papillary Thyroid Microcarcinoma: Differences in Clinical Relevance Between Nonincidental and Incidental Tumors. *World Journal of Surgery*, 33 (3), 460–468. doi: <https://doi.org/10.1007/s00268-008-9870-8>
- [21] Panta, O., Arpana, Gurung, G., Pradhan, S. (2018). Ultrasound findings in thyroid nodules: A radio–Cytopathologic correlation. *Journal of Medical Ultrasound*, 26 (2), 90–93. doi: https://doi.org/10.4103/jmu.jmu_7_17

- [22] Memon, W., Khanzada, T. W., Samad, A., Kumar, B. (2010). Incidence of thyroid carcinoma in multinodular goiters. *Rawal Medical Journal*, 35 (1), 65–67.
- [23] Bradly, D. P., Reddy, V., Prinz, R. A., Gattuso, P. (2009). Incidental papillary carcinoma in patients treated surgically for benign thyroid diseases. *Surgery*, 146 (6), 1099–1104. doi: <https://doi.org/10.1016/j.surg.2009.09.025>
- [24] Benzarti, S., Miled, I., Bassoumi, T. et al. (2002). Thyroid surgery (356 cases): The risks and complications. *Rev Laryngol Otol Rhinol (Bord)*, 123 (1), 33–37.
- [25] Prades, J.-M., Dumollard, J.-M., Timoshenko, A., Chelikh, L., Michel, F., Estour, B., Martin, C. (2002). Multinodular goiter: surgical management and histopathological findings. *European Archives of Oto-Rhino-Laryngology*, 259 (4), 217–221. doi: <https://doi.org/10.1007/s00405-002-0455-0>
- [26] Remonti, L. R., Kramer, C. K., Leitão, C. B., Pinto, L. C. F., Gross, J. L. (2015). Thyroid Ultrasound Features and Risk of Carcinoma: A Systematic Review and Meta-Analysis of Observational Studies. *Thyroid*, 25 (5), 538–550. doi: <https://doi.org/10.1089/thy.2014.0353>
- [27] Rosen, J. E., Stone, M. D. (2006). Contemporary diagnostic approach to the thyroid nodule. *Journal of Surgical Oncology*, 94 (8), 649–661. doi: <https://doi.org/10.1002/jso.20701>
- [28] Lin, J.-D. (2010). Thyroid Cancer in Thyroid Nodules Diagnosed Using Ultrasonography and Fine Needle Aspiration Cytology. *Journal of Medical Ultrasound*, 18 (3), 91–104. doi: [https://doi.org/10.1016/s0929-6441\(10\)60014-8](https://doi.org/10.1016/s0929-6441(10)60014-8)
- [29] Löwhagen, T., Granberg, P.-O., Lundell, G., Skinnari, P., Sundblad, R., Willems, J.-S. (1979). Aspiration Biopsy Cytology (ABC) in Nodules of the Thyroid Gland Suspected to be Malignant. *Surgical Clinics of North America*, 59 (1), 3–18. doi: [https://doi.org/10.1016/s0039-6109\(16\)41729-9](https://doi.org/10.1016/s0039-6109(16)41729-9)
- [30] Grant, C. S., Hay, I. D., Gough, I. R. et al. (1989). Long term follow-up of patients with benign thyroid: Fine needle aspiration cytologic diagnosis. *Surgery*, 106 (6), 980–985.
- [31] Mani, N., Mistry, S., Murthy, P. (2011). Investigating the value of fine needle aspiration cytology in thyroid cancer. *Journal of Cytology*, 28 (4), 185–190. doi: <https://doi.org/10.4103/0970-9371.86345>
- [32] Perros, P. (Ed.) (2007). Report of the Thyroid Cancer Guidelines Update Group: Guidelines for the Management of Thyroid Cancer. London: Royal College of Physicians.
- [33] Khanzada, T. W., Memon, W., Kumar, B., Samad, A. (2009). Thyroid scintigraphy: An overused investigation. *Gomal Journal of Medical Sciences*, 7 (1), 39–41.