

Cystic Adenomatoid Thyroid Nodule

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ABSTRACT

Thyroid nodules are a common clinical problem. The prevalence of palpable thyroid nodules approximately 5% in women and 1% in men. In contrast, high-resolution ultrasound (US) can detect thyroid nodules in 19-68%. The clinical importance of thyroid nodules is to exclude thyroid cancer, which occurs in 7-15% of cases depending on age, sex, radiation exposure, and family history. Incidental thyroid nodules are being diagnosed with increasing frequency in recent years with the use of newer and highly sensitive imaging techniques. The high prevalence of thyroid nodules necessitates that clinician use evidence-based approaches for their assessment and management. The revised guidelines for the management of thyroid nodules include recommendations regarding initial evaluation, clinical and ultrasound criteria for fine-needle aspiration biopsy, interpretation of fine-needle aspiration biopsy results, use of molecular markers, and management of benign thyroid nodules. Many nodules will not require biopsy. These nodules and those that are cytologically benign can be managed with long-term follow-up alone. If malignancy is suspected, options include surgery. When there are multiple options for diagnosis and/or treatment, they should be discussed with patients as frankly as possible to identify an approach that best meets their needs. This case discusses how to diagnose and treat thyroid-adenomatoid cyst thyroid nodules case with extirpation and thyroidectomy surgery so that the selection of management becomes more precise and can reduce the recurrence rate.

Keywords: *Thyroid Cyst, Adenomatoid Nodule, Benign Thyroid Nodule, Thyroidectomy*

1. INTRODUCTION

Thyroid nodules are discrete lesions of the thyroid gland. Thyroid nodules are epidemiologically common and have a high prevalence plus are frequently detected in healthy individuals or the general population. Its prevalence reaches 60% in healthy individuals detected on ultrasound examination but hardly a few of these lesions prove to be malignant, i.e. about 5% and about 65% thyroid nodules are found at autopsy. Thyroid nodules are found clinically on palpation or physical examination by the clinician or incidentally during a radiological procedure, such as ultrasound imaging (USG), computer tomography (CT scan), or magnetic resonance imaging (MRI) of the neck, or Fluorodeoxyglucose (FDG) positron emission tomography [1,2].

The initial examination of a patient who has a thyroid nodule is clinical or coincidental should include a detailed history and history based on a physical examination, and assess risk factors. In most cases, they appear in euthyroid people. Investigations such as laboratory tests should be performed for measurement of serum TSH and ultrasonography of the

neck to assess suspicious size and characteristics. Thyroid ultrasound should be performed in all suspected cases or patients with known nodules and evaluation for additional nodules and cervical lymph nodes for confirmation [1,3].

Patients who present with thyroid nodules should take a thorough history and physical examination. Nodules larger than 1 cm require further examination. Nodules less than 1 cm with suspicious ultrasound appearance and risk factors require further investigation. Imaging techniques currently used for thyroid examination include ultrasonography, computer tomography, MRI, FDG -PET scan, Iodine-131 thyroid scan and Fine needle aspiration [2,6,7,8,12].

Management and therapy in the clinical management of thyroid nodules should be based on clinical data, which is supported by the results of the ultrasonographic evaluation and cytological analysis of fine-needle aspiration. In general, there are four indications for thyroid surgery, namely; (1) thyroid cancer; (2) presence of suspected thyroid cancer, eg thyroid neoplasm based on fine-needle aspiration cytology and thyroid nodules with risk factors; (3)

compression symptoms, such as compression of the trachea, esophagus, or veins causing tightness or dysphagia; (4) cosmetic, which in the case of large nodules or multinodular goiter [3,6].

2. METHOD

We defined the keywords based and search the evidence through bibliographic database literature research (journal, case report and e-book) through Cochrane, Pubmed and Google Scholar with keywords. The articles and journal of publication, A B yielded by the search were screened regarding inclusion and exclusion criteria. **Inclusion criteria:** Type of study, we projected the study with systematic review of surgical management, or cohort study with prospective or retrospective design. **Exclusion criteria:** review articles were no cases or results. Only articles fulfilling the criteria of screening were included for further steps of data collection, analysis, and reporting.

3. RESULT

It was reported that a 58-year-old man came to the ENT polyclinic, dr. Mohammad Hoesin Palembang with complaints of lumps on the right front of the neck for 4 years ago. From the history, the lump was initially the size of a marble, which was felt to be getting bigger and spread to the front of the right neck, the lump was not painful. The lump moves along when the patient swallows. Complaints of pounding and shaking hands are absent, there is no excessive sweating. In the last 1 year ago, the lump was felt to be getting bigger until it was the size of a chicken egg. Complaints of lumps moving up and down when the patient swallows are present. The patient has a history of high blood pressure and is taking amlodipine 5 mg every 24 hours and has a history of diabetes mellitus and is taking metformin 500 mg every 8 hours per day.

Physical examination revealed good general condition within normal limits. Physical examination of the right side of the anterior colli region showed a lump with a size of 4x3x5 cm, a well-defined mass, soft palpable, flat surface, the lump moved when the patient swallowed, not tender, not fluctuating, the same color as the surrounding tissue. On palpation of the left neck, no lump was found.



Figure 1 A lump is seen in the right anterior colli region

Investigations carried out included radiological examinations in the form of neck ultrasonography on December 7, 2020, and obtained the impression of a cystic lesion with macrocalcifications on the right thyroid and suspected left thyroiditis. On computer tomography examination with contrast on November 30, 2020, the impression of a well-defined right thyroid nodule (size 4.7 x 3.36 x 5.23 cm) was differentially diagnosed with goiter nodosa. Possibly partially cystic degeneration, no mass in the nasopharynx, oropharynx, and larynx. And fine needle aspiration cytology on December 10, 2020, resulted in a benign colloid nodule, with acute thyroiditis in the right colloid region.



Figure 2 Colli Region Ultrasound

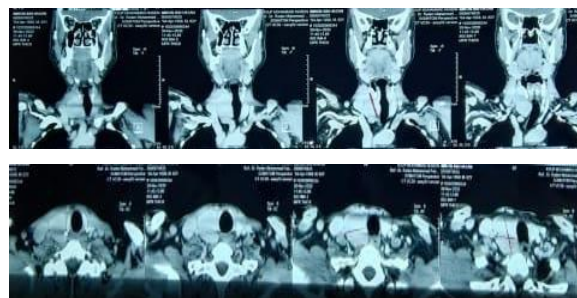


Figure 3 Computer Tomography of The Neck with Contrast

Based on the history, physical examination, and supporting examination, the patient was diagnosed with a right thyroid mass, then was prepared for the extirpation of the mass under general anesthesia. The results of blood laboratory examinations were found within normal limits and with thyroid function results all within normal limits, T3 0.9 ng/ml, 2,94 µg/ml, T4 7.71 µg/dl, FT41.03 ng/dl, TSH 0.5580 µ IU/ml.

After that, surgery was performed, the patient was under general anesthesia, the patient was placed in a supine position, antiseptic aseptic procedures were performed on the operating area, the operating area was limited to a sterile doek. A marker is made with a horizontal incision, 2 fingers above the sternal notch then the incision is deepened layer by layer. Identification of the midline of the neck, white area, and blunt dissection was performed, and the bleeding was controlled. Tile sutures were made on all four sides of the incision angle until the operating area was visible.

Strap muscles were identified so that the right thyroid layer was seen. The layer is then removed and bluntly dissected to reveal the right thyroid.

Identification was done, cystic tissue appeared, brownish in color. The tissue was removed from its base, it was seen that the cystic tissue was ruptured, and a thick, brownish colloid fluid appeared. The tissue was removed and extracted, measured, and obtained brownish cystic tissue measuring $\pm 4 \times 4 \times 1$ cm then the tissue was PA-ed. The bleeding was controlled, and the NGT drain was washed and installed. The surgical wound was sutured layer by layer, the surgical wound was closed with gauze, and the operation was complete.



Figure 4 Intraoperative Extirpation of Thyroid Mass

Postoperatively, the patient has been given intravenous ringer lactate fluid 20 drops per minute and drips ketorolac ampoule 60 mg in 500 cc RL. Antibiotic ceftriaxone 1 gram every 12 hours intravenously, and ranitidine ampoule 50 mg every 12 hours intravenously. On the first postoperative day, there were complaints at the site of minimal surgery. As many as replacement of wound dressings, minimal blood is seen in the surgical wound. NGT drainage was installed with a smooth flow, and there was blood in the 18 cc drain accommodated every 24 hours, other therapies were continued.

On the second postoperative day, complaints of pain at the site of the surgery were minimal, there was no blood in the surgical wound, 15 ccs of draining blood was accommodated in 24 hours. On the third day, blood flow was seen as much as 12 ccs in 24 hours, other therapies were continued. Day four serious mixed blood in the drain as much as 12 ccs. On the fifth day, complaints of pain in the operating area were minimal. Blood in the surgical wound had no good sutures. Ten ccs of blood mixed with serous fluid in the drain. While on the sixth day, 4 ccs of serous mixed blood in the drain, were then drained to be evaluated. Patients who were planned for outpatient treatment received medical discharge: cefixime tablets 100 mg for every 12 hours, ranitidine tablets 150 mg every 12 hours, and paracetamol tablets 500 mg every 8 hours, to take orally.

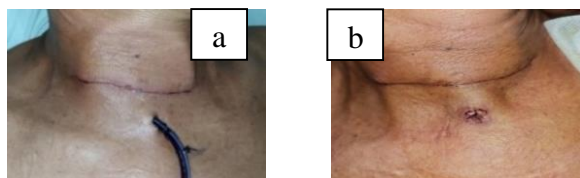


Figure 5 (a) Stitches on the first postoperative day; (b) On the sixth postoperative day, an NGT aff drain was performed.

The control patient went to the RSMH ENT clinic 2 weeks after the operation, the pain was not felt, the surgical wound was dry and the stitches were good. On the results of PA No. 04/A/2021 with macroscopic results, a piece of tissue measuring $3 \times 2 \times 1$ cm, containing a brownish color, found a mass like white agar, with capsules. The microscopic picture shows a variety of fibro collagenous connective tissue. The tumor mass was found with macrofollicular structure, micro follicular structure, some pseudopapillary structure. It was consisting of single- layered columnar to cuboidal cells, fine chromatin, eosinophilic cytoplasm, granular (oncocyte cells) partially clear, cystic dilated thyroid follicles with lumen filled colloid. The stroma of fibro collagenous connective tissue, filled with inflammatory cells, lymphocytes, plasma, and proliferating blood vessels, hyperplasia dilated. No signs of malignancy were found in this preparation. The results are with the impression of a thyroid cyst and an adenomatoid nodule with a pseudopapillary complex in the right thyroid lobe. Patients are then advised to control if there are complaints and evaluated for examination to prevent a recurrence.



Figure 6 Polyclinic Control, 2 Weeks Postoperative

4. DISCUSSION

In this case, a man, 58 years old, with a thyroid-adenomatoid cyst with a trioid nodule, came with a complaint of a lump on the right front of his neck since 4 years ago. Moon et al, reported that the prevalence of thyroid nodules and cysts was 34.2%, with female sex being more common than men, 41.7% found in women, and 27% thyroid nodules found in men and with the mean age is 49.5 years. The prevalence increases with age as the thyroid undergoes degenerative changes, leading to diffuse compensatory hyperplasia of the thyroid and ultimately to nodules. This is not much different from the research report of Jiang et al, where the prevalence of thyroid nodules was reported to be 52.5% in women and 42.7% in men. This also shows that gender differences affect the

role of estrogen and progesterone. Estrogen itself can affect the thyroid gland and stimulate the formation of thyrotropin (TSH). In normal and neoplastic thyroid tissue there are estrogen receptors, so it can be concluded that estrogen has a role in thyroid cell growth and nodule formation. Thyroid nodules are often found incidentally or accidentally on ultrasound examination, where most patients are asymptomatic in the early stages, so patients tend to ignore a lump in the neck at the beginning of the disease and come when the lump is enlarged or bothersome [17,18].

In this case, the patient had a history of DM and was taking the oral medication regularly. Moon et al, stated that the prevalence of thyroid nodules was influenced by age, gender, BMI, impaired glucose metabolism, metabolic syndrome, and diabetes. Where Zou et al, reported in their study showing that the incidence of thyroid nodules in patients with type 2 diabetes was significantly higher than in healthy people, thus indicating that DM 2 often coexists with thyroid nodules. It is due to the insulin factor that is a growth factor for the thyroid gland. Therefore, high insulin levels in circulating blood can increase thyroid cell proliferation through insulin receptors, leading to thyroid nodules. For the future physical examination of the neck palpation and thyroid, ultrasonography should be recommended in men with diabetes and the presence of central obesity and elderly women with fatty liver for early detection of thyroid nodules [17,19].

Physical examination in the case: the anterior colli region on the right side showed a lump with a size of 4x3x5 cm, a well-defined mass, soft palpable, flat surface, the lump moved when the patient swallowed, not tender, not fluctuating, the same color as the surrounding tissue. Examination of the neck, including palpation of the thyroid, and cervical lymph nodes should be part of the routine examination, with 3–7% of thyroid nodules found on palpation. Usually, these cases present as painless nodules and the patient is unaware of the growth of the nodules. The rapid growth of nodules may indicate an aggressive malignancy and may be accompanied by pain. The worrisome findings on physical examination that increase the likelihood of malignancy are: nodule size greater than 4 cm, lateral cervical lymphadenopathy, vocal cord immobility, nodules fixed to surrounding structures, and an indication for surgical excision [6,10,20].

On laboratory examination, the results of thyroid function were T3 0,9 ng/ml, FT3 2,94 µg/ml, T4 7,71 µg/dl, FT4 1,03 ng/dl, TSH 0,5580 µ IU/ml shows within normal limits. In this case, there is a risk factor for type 2 DM where there is a relationship between thyroid nodules and metabolic disorders, namely, there is a TSH-dependent mechanism that activates leptin. Leptin, directly and indirectly, increases the secretion of thyrotropin-releasing hormone, which increases the secretion of TSH. However, most patients with thyroid

nodules are euthyroid, so an assessment of serum TSH should still be performed as part of the evaluation [17].

Investigations performed included ultrasound, computer tomography, fine needle aspiration cytology. Moon et al in their study stated that the prevalence of thyroid nodules that could be detected by ultrasonography at routine health examinations was 34.2%. Grani et al. stated that ultrasound itself is the first line of examination for thyroid imaging. Ultrasound examination is considered safe, painless, can be done quickly without preparation, cost-effective, and a convenient way of examination for follow-up imaging after surgery, especially examination in a polyclinic or outpatient. Ultrasound examination does not distinguish between benign and malignant lesions but it can provide accurate basic information, which can identify the number, size, and shape of the nodules surrounding the neck and thyroid and determine the nature of the nodules whether they are solid, cystic, or mixed, compared to examination scans. On the characteristics of the thyroid nodule and the initial suspicion of malignancy, the examiner should focus on its composition (solid, cystic, mixed), size, and margins; the presence of calcified nodules or hyperechoic foci and assess all lymph nodes around the neck. In this case, an ultrasound examination of the neck revealed a cystic lesion. It was with macrocalcification of the right thyroid and suspected left thyroiditis. In cases with follicular adenoma lesions, the lesions are well-demarcated, encapsulated, and are benign follicular neoplasms [2,6,10,17].

On computed tomography with contrast, the impression of a well-defined right thyroid nodule (size 4.7 x 3.36 x 5.23 cm) was differentially diagnosed with goiter nodosa, possibly partially cystic degeneration. Computed tomography examinations may be very helpful in evaluating the condition of a massive or large goiter (either benign or malignant) to determine the extent of disease and when planning surgical management. This type of imaging is excellent in helping assess the relationship of the diseased gland to other vital structures in the head and neck, particularly the airway. Computer tomography is recommended as more sensitive for evaluating lymph nodes at the central and lateral levels compared to ultrasonography (77% versus 62%) [7,13].

Furthermore, preoperative examination in this case also performed fine-needle aspiration cytology. By the impression of a benign colloid nodule, with acute thyroiditis in the right colloid region. Tamhane et al, in their study report, stated that fine-needle aspiration cytology is especially recommended in the finding of thyroid nodules > 1 cm in size, this is to evaluate the nodules further. In general, routine fine-needle aspiration is not recommended for nodules < 1 cm in size, unless there is a suspicious sonographic appearance, as previously described. In this case, the nodule was 4.7 x 3.36 x 5.23 cm, so fine needle aspiration cytology was considered. In benign

adenomatous nodules, these nodules are nonclonal, arising from a group of follicular cells and not from a single cell undergoing neoplastic transformation. This nodule is benign, clinically resembles an adenoma, so it is called an adenomatous. It is due to follicular cell hyperplasia with colloid-filled follicles. Suspicion of a follicular adenoma lesion in the case was also assessed where the cells may have cystic degeneration, hemorrhage, calcification, and fibrosis, making it difficult to distinguish it from follicular carcinoma on fine-needle aspiration cytology because the diagnosis of carcinoma involves possible vascular and/or capsule invasion. This can be seen in the histologic findings of the mass when it is removed. Follicular adenomas may be premalignant and therefore require separate excision. In some cases, fine needle aspiration is unreliable in differentiating follicular adenoma from carcinoma, so all these lesions must be surgically excised for histopathologic features [1,6,10].

In this case report, extirpation of the thyroid mass, subtotal lobectomy of the right thyroid was performed. Grani et al, as described previously in the cytologic features referred to the classification of the findings of Bethesda class III or IV, which are associated with malignancy rates of 10-30% and 25-40%, the suggested options for identifying these nodules include repeating fine needle aspiration cytology for testing, cytology and/or molecular and diagnostic lobectomy. With $\pm 3-4$ cm-sized nodules where nodules show progressive growth and/or are suspicious on ultrasound examination. Patients may consider a family history of thyroid malignancy, radiation exposure, lobectomy, or total thyroidectomy. Total thyroidectomy should be considered for patients with large nodules, and suspicion of extrathyroidal extension, or suspicion of metastases (locoregional or distant). Thyroid cysts larger than 4 cm are surgically excised; while those measuring less than 4 cm are aspirated and suppressed with thyroid hormone (suppressive therapy), and if recurrence occurs, surgical excision should be performed. In this case report, the size of the nodule is approximately 4 cm, with the results of ultrasonography, fine needle aspiration cytology, and computer tomography. The patient is considered for extirpation surgery or subtotal lobectomy on the right thyroid. It was to determine the histopathological picture. Lobectomy has advantages over total thyroidectomy. Which eliminates the risk of permanent hypoparathyroidism and bilateral recurrent laryngeal nerve injury and substantially reduces the rate of unilateral permanent laryngeal nerve palsy (0.6% versus 1.3%). A further 50-80% of patients undergoing lobectomy do not require thyroid hormone replacement therapy (possibly varying according to preoperative TSH levels and presence of thyroid autoimmunity) [2,6,10].

The PA No. 04/A/2021 resulted in: no malignant signs on the preparation; the impression of a thyroid

cyst; and an adenomatoid nodule with a pseudopapillary complex in the right thyroid lobe. In benign adenomatous nodules, these nodules are nonclonal, arising from a group of follicular cells and not from a single cell undergoing neoplastic transformation. This nodule is benign, clinically resembles an adenoma, so it is called an adenomatous. It is due to follicular cell hyperplasia with colloid-filled follicles [6,10].

The control patient went to the RSMH ENT clinic two weeks after surgery with complaints of no pain, dry surgical scars, and conforming sutures. Patients are then advised to control if there are complaints and evaluated for examination to prevent a recurrence. Wong et al, the majority of thyroid nodules originate from thyroid cell follicles. Thyroid cancer occurs in 7-15% of thyroid nodules. Overall, thyroid cancer has a good prognosis with 5-year survival rates of 96.1% and 98.2% in patients who survive one year after diagnosis, respectively. The overall rate for the incidence of thyroid carcinoma is four per million per year, with an average mortality rate of 10%. It varies greatly depending on many factors. Grani et al. reported that after diagnostic testing, 10.8% of thyroid nodules underwent surgery. And a high percentage of resections proved to be malignant, i.e., 73.1% of resected nodules. Some nodules (14.5%) required repeat biopsy immediately or during long-term follow-up. For Bethesda II nodules a second cytology assessment was indicated only if the ultrasound risk increased during follow-up (15% over the 5-year follow-up period). Three-quarters of all nodules (74.7%) were classified as benign and could be managed with long-term sonographic surveillance [2,20].

5. CONCLUSION

These nodules and those that are cytologically benign can be managed with long-term follow-up alone. If malignancy is suspected, options include surgery. When there are multiple options for diagnosis and/or treatment, they should be discussed with patients as frankly as possible to identify an approach that best meets their needs. This case discusses how to diagnose and treat thyroid-adenomatoid cyst thyroid nodules case with extirpation and thyroidectomy surgery so that the selection of management becomes more precise and can reduce the recurrence rate.

ETHICAL DECLARATION

Authors declared that the patient was consented about publishing his case on the scientific journal.

REFERENCES

- [1] T. Shrikant, and H. Gharib. Thyroid nodule update on diagnosis and management. Clinical diabetes

- and endocrinology 2.1 (2016): 1-10.
<https://doi.org/10.1186/s40842-016-0035-7>
- [2] G. Giorgio, et al. Contemporary thyroid nodule evaluation and management. *The Journal of Clinical Endocrinology & Metabolism* 105.9 (2020): 2869-2883.
<https://doi.org/10.1210/clinem/dgaa322>
- [3] G. Hossein, et al. American Association of Clinical Endocrinologists, American College of Endocrinology, and Associazione Medici Endocrinologi Medical Guidelines for Clinical Practice for the Diagnosis and Management of Thyroid Nodules-2016 Update Appendix. *Endocrine practice* 22 (2016): 1-60.
<https://doi.org/10.4158/EP161208.GL>
- [4] N. Quang T., et al. Diagnosis and treatment of patients with thyroid cancer, *American health & drug benefits* 8.1 (2015): 30.
- [5] Ospina, Naykky Singh, et al. "Prognosis of patients with benign thyroid nodules: a population-based study." *Endocrine* 54.1 (2016): 148-155.
<https://doi.org/10.1007/s12020-016-0967-9>
- [6] Dhingra PL, Dhingra S. *Diseases of Ear, Nose and Throat & Head and Neck Surgery* 7th ed. Elsevier. 2018.
- [7] Loré, J. M., and J. E. Medina. "An Atlas of Head and Neck Surgery. 4th Editon." Philadelphia PA. Elsevier saunders 19 (2005).
- [8] C. Yvonne and J. C. Goodard, *KJ Lee's Essential Otolaryngology*. McGraw Hill Education., 2016.
- [9] F. H. Netter, MD. *Atlas of Human Anatomy* 7th Edition. Elsevier. 2019.
- [10] B. J. Jacob and J. B. Snow. *Ballenger's otorhinolaryngology: head and neck surgery*. Pmph-usa, 2003.
- [11] H. Bryan R. et.al. 2015 American Thyroid Association Management Guidelines for Adult Patients with Thyroid Nodules and Differentiated Thyroid Cancer. *Thyroid* volume 26. 2016.
<https://doi.org/10.1089/thy.2015.0020>
- [12] J. Jonas T., and Clark A. Rosen. *Bailey's Head and Neck Surgery-Otolaryngology Review*. Lippincott Williams & Wilkins, 2014.
- [13] M. Luc GT, et al. "The molecular landscape of recurrent and metastatic head and neck cancers: insights from a precision oncology sequencing platform." *JAMA oncology* 3.2 (2017): 244-255.
<https://doi.org/10.1001/jamaoncol.2016.1790>
- [14] Evans, Peter, Paul Q. Montgomery, and Patrick J. Gullane. *Principles and practice of head and neck surgery and oncology*. CRC press, 2009
<https://doi.org/10.3109/9781439825464>
- [15] F. Chiara, et al. "Ultrasound imaging classifications of thyroid nodules for malignancy risk stratification and clinical management: state of the art." *Gland surgery* 8.Suppl 3 (2019): S233.
<https://doi.org/10.21037/gs.2019.07.01>
- [16] E. David and R. V. Smith, *Complications in Head and Neck Surgery E-Book*. Elsevier Health Sciences, 2008.
- [17] M. J. Hoon, et al. Prevalence of thyroid nodules and their associated clinical parameters: a large-scale, multicenter-based health checkup study. *The Korean journal of internal medicine* 33.4 (2018): 753.
<https://doi.org/10.3904/kjim.2015.273>
- [18] Wong, Rosemary, Stephen G. Farrell, and Mathis Grossmann. *Thyroid nodules: diagnosis and management*. *Medical Journal of Australia* 209.2 (2018): 92-98.
<https://doi.org/10.5694/mja17.01204>
- [19] Z. Bing, et al. The prevalence of single and multiple thyroid nodules and its association with metabolic diseases in Chinese: a cross-sectional study. *International journal of endocrinology* 2020 (2020).
<https://doi.org/10.1155/2020/5381012>
- [20] Wong, Rosemary, Stephen G. Farrell, and Mathis Grossmann. "Thyroid nodules: diagnosis and management." *Medical Journal of Australia* 209.2 (2018): 92-98.
<https://doi.org/10.5694/mja17.01204>