

PART 1 | IMAGING IN CLINICAL PRACTICE

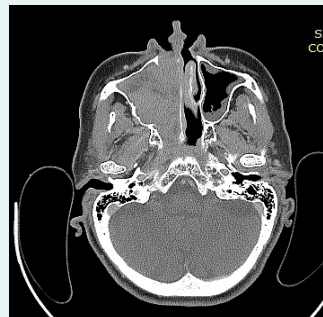
Ashraf Abdul-Jabbar Abdul-Abbas¹, Hamid Ismaeel Hamid²

¹ DMRD, Radiologist. E mail: ashraf_jabbar@yahoo.com

² FICMS, Senior ENTist, Al-Zaafaraniya General Hospital, Al-Rasafa Health Directorate, Baghdad.

A 50 years old female presented with nasal obstruction for few month duration and headache. She has no significant past medical or surgical history. She has never smoked before. The followings are the CT scan of the her paranasal sinuses.

Figure 1: CT scan of the sinuses, the upper picture is sagittal view, lower right picture is transvers section without contrast while the lower left picture is with contrast.



- Q1: Describe the radiological findings?
Q2: What are the differential Diagnosis?
Q3: What are your next step and what is the expected diagnosis?

ANSWER OF Q1:

A there is a soft tissue density mass involving the whole right maxillary sinus with destruction of the medial wall (figure 1 & 2 red arrow), and causing obstruction of the right nasal cavity (figure 2 blue arrow). The mass is measuring about 35-50 HU and showing enhancement after contrast administration measuring about 65-80 HU.

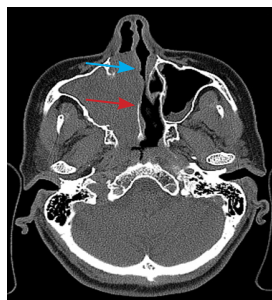


Figure 2: CT scan of the sinuses,

ANSWER OF Q2:

- A Inflammatory conditions like chronic rhinosinusitis, fungal infection.
- Mucocele.
- Granulomatous disease like tuberculosis, leprosy, rhinoscleroma and Wegner's granulomatosis.
- Retention cysts.
- Tumors – benign like osteoma, papilloma, adenoma and nasopharyngeal angiofibroma.
- Malignant like squamous cell carcinoma and adenocarcinoma.

ANSWER OF Q3:

Examination of this patient with zero endoscope reveal unilateral, fleshy, lobulated, polypoidal mass on the right side of the nose origination from the lateral nasal wall invading the right inferior and middle turbinate and it bleeds on touch. Biopsy was taken under local anaesthesia, histopathological examination revealed inverted papilloma which is benign tumour but locally invasive, surgical treatment is by doing medial maxillectomy with wide local excision of all invaded tissue, recurrence rate is high.

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PART 2 | WHAT DO YOU KNOW ABOUT?

Hyperthyroidism: What is new in the guidelines

Shakir Mahmood Muhammed

Editor-in-Chief, Consultant Pulmonologist, Human Resource Training and Development Centre/ Ministry of Health.
E mail: shakshamcar@yahoo.com

Hyperthyroidism is not a rare disease and it has a serious impact on the health. The causes of hyperthyroidism are diverse and selection of therapy may depends, to certain extent, on the cause. So how can we diagnose this disease? is it essential to determin the aetiology? what are the treatment options available, pros and cons of each type of therapy? how should we follow up the patient who is on therapy? all these questions will be answered according to the international guidelines of hyperthyroidism

1. Hyperthyroidism:

- (a) Diagnosed whe we have undetected TSH with high T₃ and free T₄.
- (b) Hyperthyroidism is synonym to thyrotoxicosis.
- (c) It includes two types overt and subclinical.
- (d) Subclinical hyperthyroidism is a milder form of overactive thyroid activity
- (e) Subclinical hyperthyroidism means undetected TSH with high T₃ and free T₄ in asymptomatic patient.

2. The epidemiology of hyperthyroidism:

- (a) Subclinical hyperthyroidism is more prevalent than overt hyperthyroidism.
- (b) Toxic Multinodular goitre is the commonest cause of hyperthyroidism.
- (c) Toxic adenoma is the commonest cause in young person.
- (d) Graves' disease is more common in areas of low iodine intake
- (e) Prevalence of hyperthyroidism is about 5% in the community.

3. A 35 year-old female developed an attack of lone AF, on examination there are no significant signs and symptoms of hyperthyroidism, the most sensitive and specific test that can

exclude hyperthyroidism is:

- (a) TSH.
- (b) Free T₃.
- (c) Total T₃.
- (d) Free T₄.
- (e) Total T₄.

4. Diagnosis of hyperthyroidism:

- (a) High free T₄, High T₃ with undetectable TSH is overt hyperthyroidism.
- (b) In T₃-toxicosis, T₃ is only elevated while free T₄ and TSH are within normal.
- (c) Normal TSH will preclude the diagnosis of hyperthyroidism.
- (d) Subclinical hyperthyroidism is diagnosed if TSH is low or undetectable with normal total T₃ and Free T₄.
- (e) High TSH preclude the diagnosis of thyrotoxicosis.

5. The followings can be used to determine the cause of hyperthyroidism:

- (a) Thyrotropin receptor antibodies (TRAb)
- (b) Thyroid Ultra sound to determine the thyroid blood flow.
- (c) Raiioactive iodine uptake (RAIU).
- (d) Free T₄

- (e) ^{99m}Tc pertechnetate.

6. Radioactive iodine uptake (RAIU):

- (a) It can be used safely in pregnancy after the first trimester.
- (b) Normal or high uptake is a marker of thyroiditis.
- (c) In factitious thyrotoxicosis RAIU is usually high.
- (d) Is usually elevated in graves' disease.
- (e) It is contraindicated in lactating women.

7. The followings are features of subacute thyroiditis:

- (a) Painless thyroid enlargement.
- (b) High ESR.
- (c) RAIU is showing high uptake.
- (d) Fever.
- (e) Hyperthyroidism is not a feature.

8. Controlling heart rate in hyperthyroidism:

- (a) Treatment is needed only in elderly people.
- (b) Indicated in patients with coexistent cardiovascular disease.
- (c) Beta blockers are the best if there are no contraindication.
- (d) Verapamil proved to be not effective in controlling rate in thyrotoxicosis.
- (e) Beta blockers are absolutely contraindicated in asthmatic patient with hyperthyroidism.

9. Treatment of Graves' hyperthyroidism:

- (a) ATDs are the most effective primary treatment.
- (b) RAI is contraindicated in pregnancy.
- (c) Thyroidectomy is the best choice if there are no contraindication.

- (d) All modality of therapy has comparable efficacy.

- (e) In pregnancy surgery is contraindicated.

10. In anti thyroid drugs (ATDs) therapy:

- (a) Propylthiouracil PTU is safe in the first trimester of pregnancy.
- (b) High dose carbimazole should be used initially for rapid control.
- (c) Carbimazole can be used in thyroid storm.
- (d) Carbimazole is effective as a single daily dose.
- (e) Propylthiouracil PTU has a long duration of action.

11. Monitoring of drug therapy for graves' disease:

- (a) Baseline white blood cells (WBC) count and differential is needed to follow up patients.
- (b) The best hormone to monitor the response to therapy is TSH.
- (c) After initiating carbimazole therapy hormonal assay is needed to be repeated within 10 days of the start to check the response and adjust the dose.
- (d) After achieving euthyroid state there is no need to monitor the hormonal level.
- (e) While the patient is on carbimazole, routine WBC count and differential is not recommended.

12. Duration of ATDs therapy for hyperthyroidism due to graves' disease:

- (a) The duration of treatment is about 12-18 months.
- (b) Before discontinuation of therapy TSH should be normal.
- (c) Measurement of TRAb is not needed to decide discontinuation of therapy.
- (d) On recurrence of hyperthyroidism after

drugs therapy another course of medical therapy is highly recommended.

- (e) Small dose 2.5-5 mg carbimazole for years can be used as an option to treat recurrence.

13. Thyroidectomy in Graves' hyperthyroidism:

- (a) It is always recommended to operate on Euthyroid state than to operate on hyperthyroid status.
- (b) Calcium, Vit D and KI is routinely recommended preoperatively.
- (c) Subtotal thyroidectomy is the operation of choice for graves' hyperthyroidism.
- (d) Carbimazole should be continued for further two weeks post operatively.
- (e) Beta blockers should be weaned post operatively.

14. Complication of thyroidectomy:

- (a) Thyroidectomy should be done only by high volume thyroid surgeon.

- (b) Following total thyroidectomy the recurrence rate is only 3 %.

- (c) Permanent hypoparathyroidectomy may occur in 5-10%.

- (d) Permanent recurrent laryngeal nerve injury in <1 %.

- (e) Mortality rate is 0.2 %.

15. Subclinical hyperthyroidism:

- (a) Treatment should be offered for all patients over age of 65 years.

- (b) Osteoporosis is a cause to treat subclinical hyperthyroidism.

- (c) Subclinical hyperthyroidism is a risk factor for AF.

- (d) Subclinical hyperthyroidism may returns to normal spontaneously.

- (e) In patient with ischemic heart disease and subclinical hyperthyroidism monitoring is only needed.

Hyperthyroidism: What is new in the guidelines

Answers of Questions on page 55-57

1. Answers (T, F, T, T, F): Thyrotoxicosis refers to a clinical state that results from inappropriately high thyroid hormone action in tissues generally due to inappropriately high tissue thyroid hormone levels, whether this high level is thyroidal or extrathyroidal. Hyperthyroidism is a form of thyrotoxicosis due to inappropriately high synthesis and secretion of thyroid hormone(s) by the thyroid gland. Hyperthyroidism is of two types; overt and subclinical depending on biochemical severity. Although in reality they it is a continuum of overactive thyroid functions. Overt hyperthyroidism is low (usually undetectable) serum thyrotropin TSH with elevated serum levels of triiodothyronine (T₃) and/or free thyroxine T₄. Subclinical hyperthyroidism is defined as a low or undetected serum TSH with normal reference range of both T₃ and free T₄. Overt and subclinical may lead to characteristic signs and symptoms but subclinical is considered milder form. Autonomous hormone production may progress from subclinical to an overt hyperthyroidism.

2. Answers (T, F, F, F, F): In the USA, the prevalence of hyperthyroidism (overt and subclinical) is 1.2 %. Subclinical hyperthyroidism is more common 0.7 % while overt hyperthyroidism is 0.5 %. Graves' disease is the commonest cause of hyperthyroidism, the other most common causes are toxic multinodular goitre and toxic adenoma. In elderly people and in areas with dietary iodine deficiency toxic adenoma is the commonest cause of hyperthyroidism.

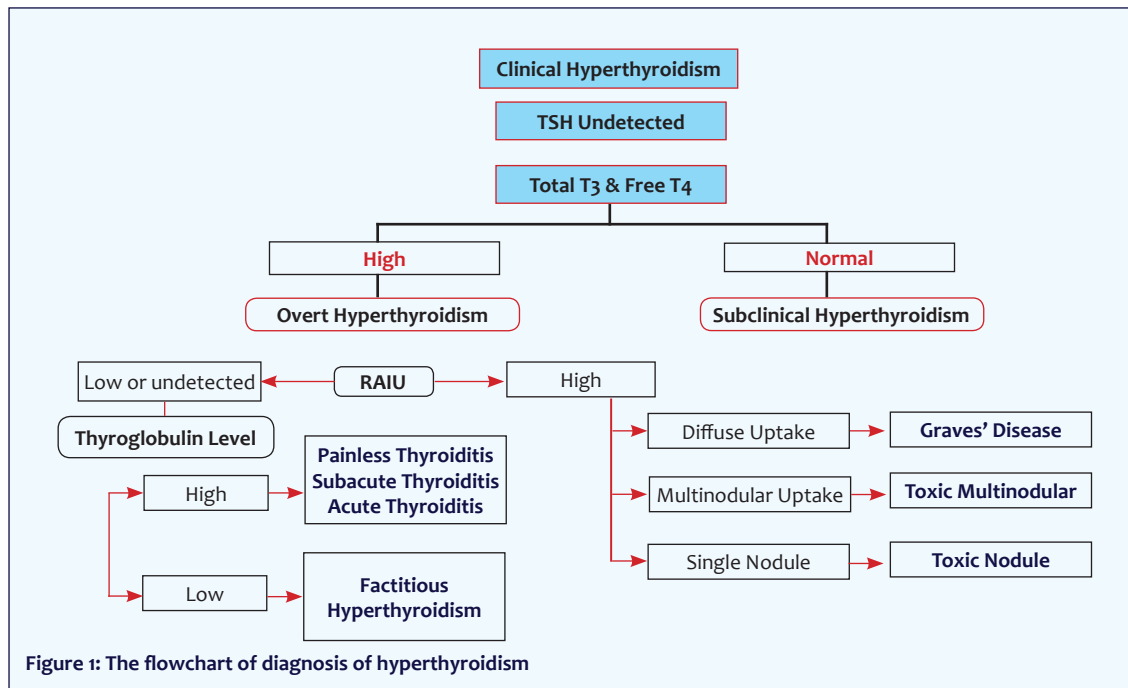
3. Answers (T, F, F, F, F): Serum TSH is the most sensitive and specific single blood test to evaluate a patient suspected to have hyperthyroidism. It is very good test to screen for hyperthyroidism. However, when thyrotoxicosis is strongly suspected, diagnostic accuracy improves when a serum TSH, free T₄, and total T₃ are assessed at the initial evaluation.

4. Answers (T, F, T, T, F): Overt hyperthyroidism means undetectable TSH with high Free T₄

and T₃. In subclinical hyperthyroidism total T₃ and free T₄ are within normal limits but serum TSH is low or undetectable. T₃-toxicosis is diagnosed when total T₃ is high with normal free T₄ and low or undetected TSH. Subclinical hyperthyroidism and T₃-toxicosis are considered a mild form of hyperthyroidism. Normal serum TSH will exclude the diagnosis of hyperthyroidism. In TSH producing pituitary adenoma high T₃ and T₄ are usually combined with high TSH.

5. Answers (T, T, T, F, T): It is recommended to determine the aetiology of hyperthyroidism once it is diagnosed biochemically, unless the diagnosis is clear by clinical examination and basic laboratory investigations. In a patient with a symmetrically enlarged thyroid, recent onset of orbitopathy, and moderate to severe hyperthyroidism, the diagnosis of graves' disease (GD) is likely and further evaluation of hyperthyroidism causation is unnecessary. By using third generation assay of thyrotropin receptor antibodies (TRAb) we can diagnosis graves' disease however, negative TRAb can be seen in mild graves' disease. Radioactive iodine uptake (RAIU) can distinguish between hyperthyroidism with high uptake and those with low or normal uptake. Table 1.

6. Answers (F, F, F, T, T): RAIU is a good test to determine the aetiology of hyperthyroidism. In general, RAIU will lead to classify the causes of hyperthyroidism into two groups; normal or high RAIU uptake and low RAIU uptake (**Figure 1**). RAIU is contraindicated in pregnancy and lactation. Doppler neck ultrasound can replace RAIU in pregnancy and lactation. In graves' disease and toxic nodule, T₃ is elevated above the upper limit of normal more than T₄ while T₄ is elevated more than T₃ in thyroiditis induced hyperthyroidism and in factitious thyrotoxicosis. The choice of initial diagnostic testing depends on cost, availability, and local expertise. TRAb is cost effective because if it is positive it confirms the diagnosis of the most common cause of thy-



rotoxicosis. If negative it does not distinguish among other aetiologies; however, it can be negative in very mild GD. If third-generation TRAb assays are not readily available, RAIU is preferred for initial testing. The RAIU may be low after exposure to iodinated contrast in the preceding 1–2 months or with ingestion of a diet unusually rich in iodine. **Figure 1**

7. Answers (F, T, F, T, F): Subacute thyroiditis is a recognized cause for hyperthyroidism, characterized by enlarged, hard, and painful thyroid with fever. It is one of the cause of low RAI uptake. Thyroglobulin is usually elevated in thyroiditis while it is normal or low in factitious thyrotoxicosis. It is very important to exclude thyroiditis as a cause of hyperthyroidism because it is not recommended to subject those patients to antithyroid drugs, radioactive iodine therapy and thyroidectomy.

8. Answers (F, T, T, F, F): Randomised controlled trials have shown that beta blockers are effective in controlling rate in thyrotoxicosis. It is indicated in all symptomatic patients especially elderly. Patient who has resting heart rate of 90 b/m and has concomitant cardiovascular disease is a good candidate for rate controlling drugs. Beta blocker is relatively contraindicated in asthma and COPD, but in mild cases, selective beta blockers can be used with caution and under good monitoring of pulmonary functions. The best sur-

rogate for beta blockers once they are intolerant is oral calcium channel blocker such as verapamil and diltiazem.

9. Answers (F, T, F, T, F): RAI therapy, ATDs, or thyroidectomy can be used to treat Graves' hyperthyroidism with a comparable efficacy. The treatment selection should be discussed with each patient taking into account the local availability, associated costs, presence of factor favouring one modality over the others and presence of contraindication to one modality **see table 1-3**. Studies have shown that The long-term quality of life (QoL) following treatment for GD was found to be the same in all modality. In the USA, RAI reported as the commonest modality of treatment for graves' disease, while in Europe and Japan ATDs is the most frequent choice used.

10. Answers (T, F, F, T, F): Carbimazole should be used in virtually every patient who chooses ATD therapy for GD except: 1) the first trimester of pregnancy when Propylthiouracil (PTU) is preferred, 2) in the treatment of thyroid storm, and 3) in patient with minor reactions to carbimazole who refuses RAI therapy or surgery. It is effective as a single daily dose due to its relatively long duration of action in comparison to PTU. Initial doses of 10– 30 mg daily are used to restore euthyroidism, and the dose can then be titrated down to a maintenance level (generally 5– 10 mg daily). It is not always recommended to used high

Table X : Clinical situations that favour and contraindicate RAI therapy as treatment for Graves' hyperthyroidism**Favouring Radio Active Iodine (RAI) therapy:**

1. Women planning a pregnancy in the future after 6 months
2. Individuals with co-morbidities increasing surgical risk
3. Patients with previously operated or externally irradiated necks
4. Lack of access to a high-volume thyroid surgeon
5. Patients with contraindication to ATD use or failure to achieve euthyroidism during treatment with ATDs.
6. Patients with periodic thyrotoxic hypokalaemic paralysis
7. Right heart failure pulmonary hypertension
8. Congestive heart failure

Contraindication to RAI:

1. Pregnancy
2. Lactation
3. Coexisting thyroid cancer or suspicion of thyroid cancer
4. Individuals unable to comply with radiation safety guidelines
5. In women planning a pregnancy within 4–6 months.

Table X : Clinical situations that favour and contraindicate ATDs therapy as treatment for Graves' hyperthyroidism**Situations Favouring Anti Thyroid Drugs (ATDs) Therapy:**

1. Patients with high likelihood of remission (patients especially women with mild disease, small goitres, and negative or low-titer TRAb)
2. Pregnancy.
3. The elderly or others with co-morbidities increasing surgical risk or with limited life expectancy.
4. Individuals in nursing homes or other care facilities who may have limited longevity and are unable to follow radiation safety regulations.
5. Patients with previously operated or irradiated necks.
6. Patients with lack of access to a high-volume thyroid surgeon.
7. With moderate to severe active GO.
8. Patients who need more rapid biochemical disease control.

Contraindication to ATDs:

1. Previous known major adverse reactions to ATDs.

Table X : Clinical situations that favour and contraindicate ATDs therapy as treatment for Graves' hyperthyroidism**Situations Favouring Surgery (Thyroidectomy):**

1. Women planning a pregnancy in <6 months provided thyroid hormone levels are normal
2. Symptomatic compression or large goiters (≥ 80 g)
3. Relatively low uptake of RAI
4. When thyroid malignancy is documented or suspected (suspected or aspiration cytology)
5. Large thyroid nodules especially if greater than 4 cm or if nonfunctioning, or hypofunctioning on ^{123}I or $^{99\text{m}}\text{Tc}$ pertechnetate scanning
6. Coexisting hyperparathyroidism requiring surgery
7. TRAb levels are particularly high
8. Patients with moderate to severe active GO.

Contraindication to Thyroidectomy:

1. Substantial co-morbidity such as cardiopulmonary disease
2. End-stage cancer or other debilitating disorders
3. Lack of access to a high-volume thyroid surgeon.
4. Pregnancy is a relative contraindication Thyroidectomy is best avoided in the first and third trimesters of pregnancy
5. Surgery should only be used in the circumstance when rapid control of hyperthyroidism is required and antithyroid medications cannot be used

dose from the start because of the unnecessary risk of hypothyroidism. The guide for the initial dose should be the TSH, T₃ and T₄ levels. Patient should be educated about the duration needed for this treatment and the potential side effect and how to behave once they occur. Block and replace therapy (high dose carbimazole with low dose thyroxine) is not recommended because it has been shown to result in a higher rate of side effects. PTU has a shorter duration of action so we use it 2-3 times a day.

11. Answers (F, F, F, F, T): Baseline WBC count and differential and Liver enzymes are not recommended on a routine base. During therapy WBC count and differential count are needed only when the patient develops febrile illness or at onset of pharyngitis. Liver enzymes needed to be checked when the patient develops signs and symptoms suggestive of liver disease. Monitoring of response to therapy is preferably made by T₃ level because TSH may continue suppressed for a long time even after other hormones return to normal. T₄ may return to normal rapidly leaving only high T₃ level. After initiating ATDs therapy, hormonal assay should be check after 2-6 weeks depending on severity. After achieving euthyroid state the dose should be minimized by up to 50 % and rechecked again every 2-3 months.

12. Answers (T, T, F, F, T): If carbimazole is chosen as the primary therapy for GD, the medication should be continued for approximately 12–18 months, thereafter discontinue only if the TSH and TRAb levels are normal. In cases of recurrence of hyperthyroidism after discontinuation of drug therapy, RAI and thyroidectomy would be a good solution. Continued low-dose carbimazole treatment for longer than 12–18 months may be considered in patients not in remission who prefer this approach or have a contraindication for other modality of therapy. Patients with persistently high TRAb could continue ATD therapy (and repeat TRAb after an additional 12–18 months) or use alternate definitive therapy like RAI or surgery.

13. Answers (T, F, F, F, T): It is always recommended to operate on euthyroid than on hyperthyroid state due to potential high complications in the latter.

perthyroid state due to potential high complications in the latter. Carbimazole is preferred to render hyperthyroidism into Euthyroid state pre-operatively. Carbimazole can be stopped at the time of thyroidectomy while beta blockers, if the patient is using them, should be weaned post operatively. The recommended procedure in graves' disease is total or near total thyroidectomy, subtotal thyroidectomy has a high rate of recurrence. Calcitriol supplementation should be considered pre-operatively in patients at increased risk for transient or permanent hypoparathyroidism. While KI or Lugol's solution is recommended due to its role in decreasing thyroid blood flow, vascularity, and intra-operative blood loss during thyroidectomy.

14. Answers (T, F, F, T, F): Thyroidectomy should be referred for a high-volume thyroid surgeon. High volume thyroid surgeon is defined as a surgeon who is doing more than 25 thyroidectomies per a year. In those hands the recurrence rate of hyperthyroidism post total thyroidectomy is 0 % while it is 8 % after subtotal thyroidectomy. Permanent hypoparathyroidism is < 2 %. Permanent recurrent laryngeal nerve injury is < 1%. Mortality rate following thyroidectomy in high volume thyroid surgeon is ranging from 1/10000 to 5 in a million.

15. Answers (T, T, T, T, F): Low or undetectable TSH with normal T₃ and T₄ is the diagnostic criteria for subclinical hyperthyroidism. Annually up to 7 % of subclinical hyperthyroidism progresses to overt hyperthyroidism. Over 5 years, up to 12 % TSH may reverse to normal, in about half of them spontaneously. Studies have shown that subclinical hyperthyroidism increases the risk of overall mortality, cardiovascular mortality, atrial fibrillation, and tendency for osteoporosis and fractures. Treatment of SH depends on severity of decrease in TSH, age of the patient and presence of symptoms and presence of concomitant cardiovascular disease and osteoporosis. Age ≥ 65 years with or without symptoms or risk factors should be treated if subclinical hyperthyroidism has persistently proved (over 3-6 months). Patient below age of 65 should be treated if he has symptoms or has CVD or osteoporosis.

Answers depend on guidelines of American Thyroid association 2016

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PART 3 | Medical Ethics in Clinical Practice

Huda Adnan Habib

1MBChB, FICMS FM, Family Medicine Consultant, Assistant Professor, Family and Community Medicine Department / Al-Kindy College of Medicine / University of Baghdad. Iraq. E mail: huda_adnan70@yahoo.com

INTRODUCTION

Medical ethics, which is concerned with ethical issues that arise in the clinical context, is related to the care of specific patients.¹ The historical model for the physician-patient relationship involved patient dependence on the physician's professional authority. Believing that the patient would benefit from the physician's actions, a paternalistic model of care developed.

During the second half of the twentieth century, physician-patient relationship has evolved towards shared decision making. This model respects the patient as an autonomous agent with a right to hold views, to make choices, and to take actions based on personal values and beliefs.²

Autonomy requires the ability to decide for the self, free from control of the others, and with sufficient level of understanding so as to arrive at a meaningful choice. A person should have the capacity to decide upon a course of action, and to put that plan into action.^{3, 4} The principle of respect for autonomy is usually associated with allowing or enabling patients to make their own decisions about which health care interventions they will or will not receive.⁵

The implications of respect for patient autonomy in health care include:

1. Seeking consent for medical treatment and procedures (Informed consent).
2. Confidentiality.
3. Communication. e.g listening, how much does the patient want to know.
4. Disclosing information about their medical condition to patients (Truthfulness).
5. Maintaining patient privacy.

The following case scenarios represent challenges to the treating physicians especially in cultures that are not evolving their own definitions for privacy and confidentiality of the patients at the same time lacking the distinct boundaries of between what is the sacred right of the patients and the gray zone of guardianship that their first degree relatives may have. When we discuss this issue we need to put in our mind that first degree relatives, and even second degree relative in many times, have the judicial and tribal right to talk on behalf of the patient himself.

CASE SCENARIOS

Case 1: Breaking Bad News

Salam is a 66 year-old man, heavy smoker. A needle biopsy of a mass in his chest has shown Bronchogenic carcinoma, and staging has revealed a stage IV adenocarcinoma. His wife has begged you not to tell him because, as she explained, he is sentimental and sensitive and such a gloomy fate may even kill him even faster.

What is the best option the doctor follow?

- a) The doctor should honour the request of the family member who is protecting his beloved

wife from the bad news.

- b) The doctor should tell Salam's wife that under any circumstance it is not permitted to withholding such news from the patient.
- c) Due to very bad health situation, the doctor can accept to hide at least major part of the problem from the patient.
- d) The doctor should ask Salam how he wants to handle the information in front of the rest of the family, and allow for some family discussion time for this matter.

Case 2: confidentiality

A 62 year-old man has diagnosed as ischemic heart disease with severe left ventricular systolic dysfunction. The patient privately has asked you not to share this information with his wife who is standing outside the room because the patient thinks that the diagnosis will affect her psychology negatively. When you get out of the room, the patient's wife has asked you about the diagnosis and prognosis of the her husband's health problem.

What are you required to do legally?

- a) The doctor should tell patient's wife about the patient's disease and its prognosis.
- b) The doctor should not disclose any information to the patient's wife himself and let the nurse take this responsibility.
- c) You should do all effort to encourage an open dialogue between them, as the patient's health status will affect the wife directly and indirectly.
- d) The doctor should not encourage the patient to tell his wife about his medical condition.

Answer of case 1: d.

In advanced metastatic carcinoma of the lung, like the case scenario above, family member would like to protect their beloved ones from the psychological consequences of a bad news. Knowing frankly the details of diagnosis is part for the right for any patient according to many recommendation. And this is not for the sake of the acquiring this right but it is part of the right to decide which treatment should be accepted by the patient and which one should be refused beyond doubt without knowing the diagnosis the patient would be able to decide. So cancelling the patent from this equation is not accepted. So the best answer would be to ask the patient in front of his family about

how he wants to handle the information. Ask Salam how he wants to handle the information in front of the rest of the family, and allow for some family discussion time for this matter.⁶

Answer of the case 2: c.

The duty to maintain confidentiality remains strong in this case as information about the patient's health does not directly concern others' health, welfare, or safety. There is no imminent danger to others here. However, the wife is certainly affected by her husband's health and prognosis and every effort should be made to encourage an open dialogue between them. It remains his responsibility to do so.⁷

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