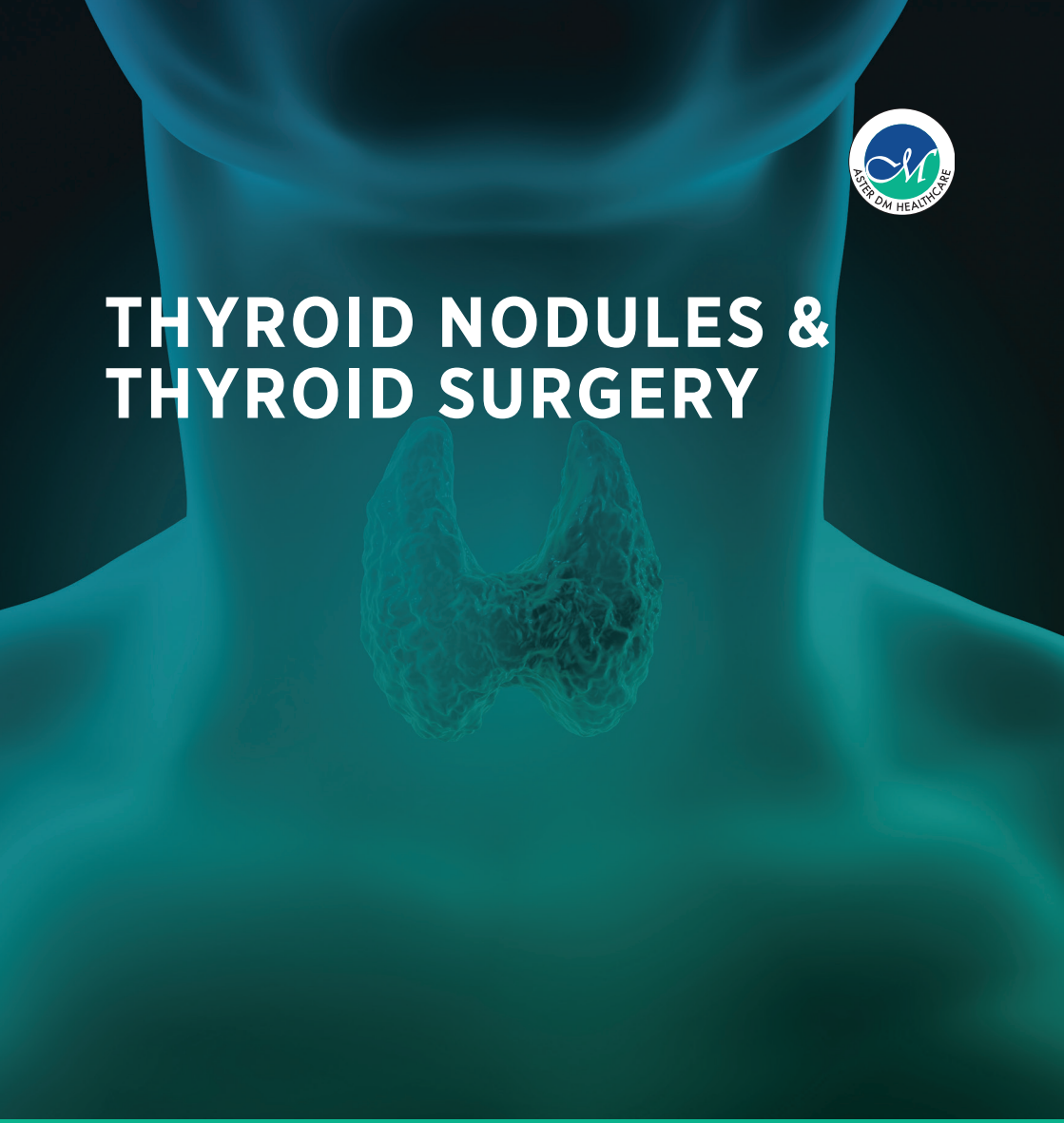

THYROID NODULES & THYROID SURGERY

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THYROID NODULES & THYROID SURGERY

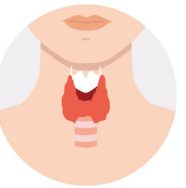
General Information Regarding Thyroid Gland

The thyroid gland is a small, shaped like a butterfly or shield, located at the root of the neck in the front of the wind-pipe. There are 2 lobes, 1 on each side, with a connecting bridge, known as the 'isthmus' in the centre. Everyone has a thyroid gland, all genders. The gland produces thyroid hormones, the most important is known as Thyroxine (T4), which enters the blood-stream and influences various systems and processes in our body. The processes influenced by the thyroid hormone are varied, and it plays a vital role in growth and development, metabolism, body-temperature regulation, heart-rate and circulation, among other things. Our body's requirement for this hormone varies during different phases of our life such as – childhood, adolescence and puberty, pregnancy and lactation, menopause and old-age; and this requirement is varied during different phases of a single day, such as early mornings, meal-times, physical exertion and when we are asleep. Our body has a complex but finely tuned mechanism to control the ups and downs necessary in thyroid hormone production during the course of a person's day as well as different phases of an individual's life.

Common Disorders Of The Thyroid Gland:

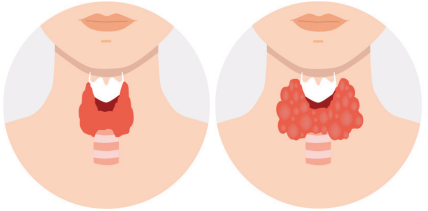
Thyroiditis: This is an inflammatory condition of the gland, caused by viral infection or autoimmune disorder. Patients often have no symptoms of this condition or sometimes they have pain.

Hypothyroidism: When the gland is not able to produce enough hormone that is required for the body. This is a very common condition and it can lead to various problems in children and adults, such as lethargy, intolerance to cold, excessive sleep or weight gain. After proper evaluation, this can be treated quite easily with thyroid hormone replacement, which needs to be monitored and followed up regularly.



Hyperthyroidism: When the gland produces excess hormone to our requirement. This can also lead to various symptoms such as easy fatiguability, palpitations, intolerance to heat, sleeplessness or weight loss. Once diagnosed and evaluated, this can be treated with medication and non-surgical options in majority of the patients.

Multinodular Goitre: This is a common condition. A goitre means an enlarged thyroid gland. Most goitres are harmless. Some goitres are due to iodine-deficiency in the diet, and some are due to inflammatory conditions of they thyroid gland. Most of the goitres are harmless and don't need surgery. Some goitres can grow to large sizes over a period of time and can cause pressure on the wind pipe and food-pipe, resulting in breathing and swallowing difficulty.



A symmetrical enlargement of the gland leads to the wind-pipe being

pushed to one-side at the root of the neck and this can cause difficulty breathing. Occasionally, they may become 'retrosternal', meaning they grow downwards into the chest behind the breast-bone.

Thyroid Nodule: These are lumps/masses

which develop within the thyroid gland. This is also a very common condition in our population. Thyroid nodules are often detected incidentally, when patient undergoes USG (ultrasonography) neck or other scans for other indications. The nodules themselves do not cause any symptoms and often there is no hormonal imbalance. Most of these nodules are also harmless. However, a proper evaluation is necessary to determine which nodules are harmless and need no intervention and which ones need further testing or surgery.

Thyroid Cancer: The incidence of thyroid cancer is rising due to better access to health-care, timely referrals and testing and thus, early detection of such cancers. Treatment of thyroid cancer depends on the type of cancer. These can be easily be controlled with very less morbidity (fewer adverse effects) when detected early. The treatments include surgery, radioactive iodine therapy, hormonetherapy and sometimes radiotherapy and chemotherapy.

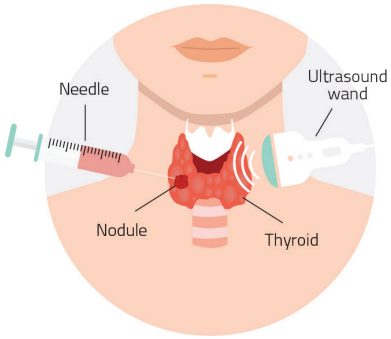
Question And Answer

WHAT ARE THE SYMPTOMS IN A PATIENT WITH THYROID NODULE(S)? HOW ARE THYROID NODULES DETECTED?

Thyroid nodules often cause no symptoms at all. They are usually detected during a physical examination by a doctor or incidentally detected when a patient undergoes a scan such as a USG (ultrasonography) of the neck, CT or MRI scan of the neck or chestor a PET/CT. By the age of 60 years, majority of the men and women have thyroid nodules. Most of these nodules are harmless and need no intervention, however, proper evaluation is necessary to determine whether the nodule is harmful.

WHAT ARE THE TESTS NEEDED FOR EVALUATION, ONCE A THYROID NODULE IS DETECTED?

Thyroid nodules need to be evaluated



with thyroid function tests, thyroids cintigraphy, USG (ultrasound ultrasonography) neck and FNAC (fine needle aspiration cytology). The sequence of these tests is important, and these should be ordered by a doctor after dueclinical evaluation, in conjunction with other tests.

WHAT ARE THE TREATMENT OPTIONS FOR A THYROID NODULE?

Majority of the thyroid nodules are deemed to be harmless after a thorough evaluation – these nodules only need long-term follow up with an endocrinologist, to ensure that they don't increase in size or number and that the patient's thyroid function remains normal. If a nodule is suspected to have a tumour or a cancer, only then the patient needs surgery. Surgery may be a partial gland removal – thyroid lobectomy/ hemithyroidectomyor a total thyroidectomy. Some nodules are difficult to diagnoseprior to surgery, in such cases, surgery may be recommended in order to obtain the correct diagnosis.

WHO IS AT A HIGH-RISK OF DEVELOPING THYROID NODULES?

Individuals with a family history of thyroid cancer, especially among first-degree relatives and individuals exposed to ionizing radiation are at highest risk. In general, women are more likely to develop thyroid nodules after the age of 40 years. However, nodules do occur in men and they are more likely to be dangerous.

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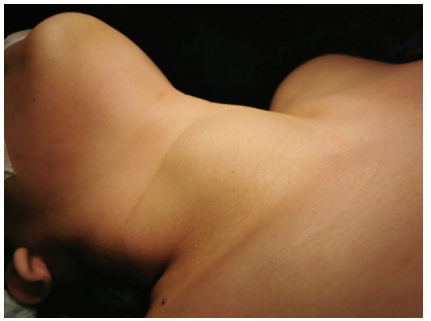

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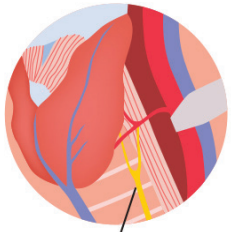
WHICH PATIENTS WITH THYROID DISEASE NEED SURGERY?

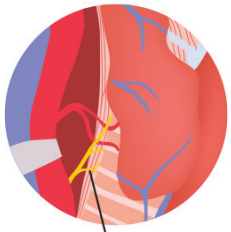
- Thyroid surgery is recommended for the following conditions:
- Goitre causing compression on the wind-pipe or food-pipe
- Retrosternal goitre – when the goitre grows into the chest, behind the breast-bone
- Thyroid cancer
- Thyroid nodule or goitre which causes symptoms of hyper thyroidism
- Thyroid nodules which are at a high-risk of harboring a tumour or cancer, and the diagnosisis in determinate after appropriate and thorough evaluation.

WHAT ARE THE RISKS OF THYROID SURGERY?

This is a routinely performed surgery in most hospitals and the usual risks such as bleeding, infection and delayed healing which accompany all types of surgery are to be expected. However, these can be minimized by taking proper precautions and meticulous techniques during surgery and postoperative care. Specifically related to thyroid surgery there are 2 unique risks – Vocal cord paralysis and Hypocalcemia. Vocal cord paralysis can occur due injury the recurrent laryngeal nerve



Left Recurrent Laryngeal Nerve



Right Recurrent Laryngeal Nerve

during surgery. This nerve runs very close to the thyroid gland and needs to be handled carefully.

With proper refinements in the technique of surgery and meticulous attention to detail, the risk of such injury can be minimized. Most of these paralyses are temporary and will recover with proper speech and swallowing therapy. Hypocalcemia – low calcium level in the blood, occurs due to injury to the parathyroid gland and low levels of parathyroid hormone. This is also temporary in most cases and recovers with proper monitoring and supplementation of Calcium and Vitamin D.

HOW CAN WE REDUCE THE RISKS ASSOCIATED WITH THYROID SURGERY?

To reduce the risks of surgery, thorough preoperative evaluation is important. During surgery, use of various refinements such as magnification, proper tissue handling and meticulous attention to detail are very important. Vigilance during postoperative care also goes a long way in identifying complications that can be treated in a timely manner to avoid long-term adverse effects.

IS IT NECESSARY TO TAKE A TABLET AFTER THYROID SURGERY?

HOW LONG DOES ONE NEED TO TAKE THE TABLET?

When a patient has had a total thyroidectomy, they need life long thyroid hormone replacement. This is well established and safe, protocols for monitoring and timely testing to check whether the replacement is adequate or not must be followed. There are minimal side-effects when thyroid function is duly monitored by a doctor and in general these are not very expensive. After a thyroid lobectomy or hemi-thyroidectomy, occasionally the patient may require thyroid hormone supplement until normal hormone levels are achieved. These patients also require regular monitoring of hormone levels, even patients who do not require hormone replacement immediately after surgery, as these levels change as a patient advances in age and the requirement will vary accordingly.

WHAT ARE THE PHYSICAL RESTRICTIONS AFTER THYROID SURGERY?

Most patients can go back to routine physical activity once discharged home. They should avoid strenuous activity and lifting heavy weights for a couple of weeks, but most other activities can be resumed as before surgery. After 2 weeks, most patients have no physical restrictions.

ARE THERE ANY RESTRICTIONS TO SPEAKING AND SWALLOWING AFTER SURGERY? WILL THERE BE A FEEDING TUBE OR BREATHING/TRACHEOSTOMY TUBE?

No. If the patient has a surgery without complications, there are no restrictions. If there are complications, the patient needs speech and swallowing therapy, and in a graded manner, majority of the patients resume oral intake as before surgery. Most patients do not need long-term feeding tubes or tracheostomy tubes after surgery.

WHAT ARE THE DIETARY RESTRICTIONS AFTER SURGERY?

Most patients are able to take all types of foods after surgery. In patients whom radio active iodine scan and / or therapy may be required after surgery,a low-iodine diet is recommended in order to prepare them for the scan. They are able to resume their diet without any restrictions after the scan or therapy.

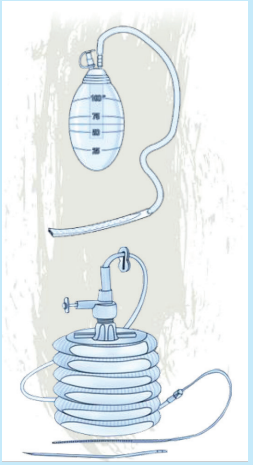
HOW LONG DOES IT TAKE TO RETURN TO NORMAL LIFE AFTER THYROID SURGERY?

The patient is admitted to hospital for 3-5 days and they need about 1 week of rest at home to recover. They can carryout most routine household activities while at home. Most of the patients are able to resume all of their physical activities (professional, social and sport/athletic exercises) two weeks after the operation.

WHAT DOES THE SURGICAL INCISION LOOK LIKE AND WHAT KIND OF SCARRING IS EXPECTED? WHAT CARE NEEDS TO BE TAKEN FOR THE WOUND?

Usually, there is a horizontal linear wound in front of the neck just above the collar bone, about 6-8cm in size. This blends with our natural skin-creases and fades with time in majority of the patients. For the first few days after surgery, there may be a drain-tube placed in the wound, which brings out all the collected blood and tissue-fluid. These are used in order to ensure proper wound healing, avoid

infections and proven to be safe. The drain tube needs to be removed a few days after surgery. The stitches usually are taken with 'absorbable' material and do not need to be removed. There can be a swelling of the neck skin after surgery, which usually settles in a couple of weeks. To improve the appearance of the scar and avoid long-term swelling, once the skin wound has healed properly, neck massages are started (under surgeon's instruction and supervision) and these are very useful to improve the cosmetic outcome.



HOW COMMON ARE THYROID NODULES IN CHILDREN? HOW ARE THEY MANAGED?

Thyroid nodules are very common in children. However, most of these are benign or harmless. A thorough evaluation should be carried out to determine if these nodules are harmless. Thyroid nodules once detected in children require regular follow up with the pediatrician/ endocrinologist. Surgery is required rarely in case a tumour or cancer is diagnosed in the thyroid nodule.

HOW ARE THYROID NODULES DIAGNOSED AND MANAGED IN PREGNANT WOMEN?

Thyroid nodules may first appear during pregnancy or a pre existing nodule may increase in size during pregnancy. Depending on the trimester in which this is detected and the patient's condition, further testing may be carried out. Majority of these nodules do not need any intervention. In many of these nodules intervention can be safely delayed until after the baby's birth or after the lactation period. However, these decisions need to be made after thorough evaluation by a multi disciplinary team and they should be followed very closely throughout the pregnancy and lactation period. In case these nodules have a fast growing or aggressive type of cancer, then a surgery may need to be carried out during the second trimester safely if planned well and due care taken in the perioperative period by the treating team of doctors.

WHAT ARE THE LONG-TERM EFFECTS OF THYROID SURGERY ON THE PATIENT'S PHYSICAL CONDITION?

Scars of thyroid surgery fade over a period of time. With conventional thyroid surgery, the scars usually blend with the natural skin creases in the neck. Most vocal cord paralyses and hypocalcemias recover over few weeks following surgery and do not require additional intervention.

WHAT ARE THE SYMPTOMS OF THYROID CANCER?

Thyroid cancer in the early stages is often a symptomatic and it is often detected when a patient undergoes a checkup and the doctor suspects a thyroid nodule. Sometimes it is picked up in a USG scan carried out for some other reason. Sometimes, it is detected only after it spreads to lymph nodes in the neck on either side and they form a lump or mass, which is usually painless. Occasionally, a patient may have a thyroid cancer that has spread to the bones, such as spine, rib and because of the tumour in the bone the thyroid cancer is detected. In these patients, the tumour in the thyroid does not cause any discomfort to the patient, hence it is ignored or missed.

WHAT ARE THE TYPES OF THYROID CANCER? WHAT ARE THE TREATMENT OPTIONS FOR THYROID CANCER?

There are 4 types of thyroid cancer – papillary, follicular, medullary and anaplastic. The papillary and follicular cancers are the most common and are often clubbed together as 'differentiated thyroid cancer' or DTC. These cancers have similar patterns of growth and spread. Their treatment is mainly in the form of initial surgery followed by radio active iodine therapy and hormone suppressive therapy. Rarely they may require external beam radiotherapy or chemotherapy. Medullary thyroid cancer is also treated with surgery initially and may need post operative radiotherapy. Anaplastic cancers are rare but aggressive in nature and require multi modality treatment.

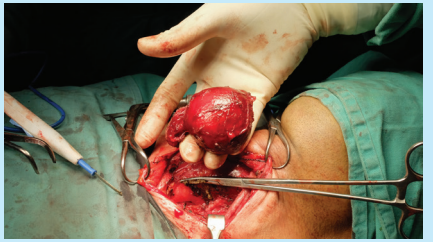
WHO IS AT A HIGH-RISK OF THYROID CANCER? HOW SHOULD THEY BE SCREENED FOR THYROID CANCER?

Family members of patients with multiple endocrine neoplasia or thyroid cancer and persons exposed to ionizing radiation are at a high-risk of developing thyroid cancer. If a genetic mutation has been identified in a family, all patients require screening with a clinical examination, USG neck and laboratory tests such as calcitonin and CEA, depending on the type of thyroid cancer. Testing for genetic mutations must be carried out in the index patient first after proper genetic counselling. Based on the results of the genetic mutation test, the doctor can make recommendations for the tests required for the family members who are at risk.

WHAT IS THE PROGNOSIS OF THYROID CANCER?

Differentiated thyroid cancers (DTC) have an excellent prognosis in the early stages. When treated properly and followed up regularly, these patients go on to live normal and productive lives without reduction in their life span. Even when these cancers have spread to the lymph nodes or at times to other organs such as lungs and bones, these patients can have a good quality of life (QOL) with appropriate treatment. Many of them remain active and productive in their professional and social lives, provided they receive adequate treatment and are meticulously followed up.

WHAT ARE THE DIFFERENT TYPES OF SURGERY FOR THYROID DISORDERS?



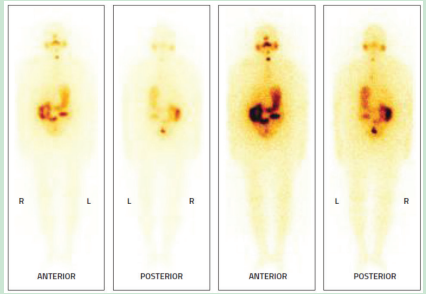
Thyroidectomy is the removal of the thyroid gland. Thyroid lobectomy or Hemithyroidectomy refers to the removal of one-half portion of the thyroid gland depending on the side that is involved, right vs. left. Total thyroidectomy is the removal of the entire thyroid gland.

HOW DOES ONE CHOOSE WHICH SURGERY IS APPROPRIATE?

The choice of surgical procedure depends on the age and gender of the patient, the preoperative diagnosis, the nature of the disease and its prognosis, as well as factors such as patient's profession and ability to be compliant with follow-up after a particular procedure. There are evidence-based guidelines available

that help the treating teams in making these decisions and patients should be evaluated by a multidisciplinary team before such complex and irreversible decisions are made. Patients must also be thoroughly educated regarding treatment options before making the choice and should actively participate in the decision-making prior to surgery.

WHEN IS RADIOACTIVE IODINE THERAPY RECOMMENDED?



Radioactive iodine recommended in toxic goitres causing hyperthyroidism, with the intention to reduce the size as well as hyper-functioning of the gland. In thyroid cancer it is recommended as adjuvant therapy to destroy remnant thyroid tissue after surgery (in some cases there is a small amount of thyroid tissue near the laryngeal nerve which remains after surgery) as well as to destroy metastatic cancer (cancer that has spread beyond the thyroid gland). Radioactive iodine therapy may require to be carried out in more than 1 sitting, usually with a gap of 6 months.

WHAT IS TSH-SUPPRESSION THERAPY? WHAT ARE THE LONG-TERM EFFECTS OF THIS THERAPY?

Depending on the risk-stratification of a differentiated thyroid cancer, a patient with intermediate and high-risk DTC, will require TSH-Suppression therapy. This is a proven and established therapy to reduce the recurrence rate of these cancers. Patient receives a higher dose of thyroid hormone -T4/Thyroxine after surgery with the intention to reduce TSH hormone levels in the body. TSH is a hormone produced by the pituitary gland, and in patients with thyroid cancer, this hormone helps thyroid cancer to grow and spread. The target-level of TSH is individualized for each patient by the multi disciplinary team of doctors based on the patient's risk-level, age, type of cancer and response to treatment.

TSH levels are then monitored life-long. TSH suppression is safe for most patients and long-term effects on the heart and bones can be minimized if properly monitored by the treating doctors.

WHAT IS THE FOLLOW-UP OF PATIENTS WITH THYROID CANCER?

Patients need lifelong follow up after treatment of thyroid cancer,in order to ensure that their hormone suppressive therapy is going as per protocol and for early detection of cancer recurrence.

For the first 2 years, the patient is seen and evaluated at 3-6 monthly intervals by the endocrinology and nuclear medicine doctors and depending on whether the cancer is well controlled, the gaps between follow up appointments can be safely increased. In the long-term, most patients need to be seen only once a year, but this should be done regularly, life-long.

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