

Patient Information Leaflet 5: Medullary thyroid cancer

What is medullary thyroid cancer?

Medullary thyroid cancer (MTC) is a rare form of cancer of the thyroid gland. It usually occurs as an isolated case on its own (sporadic), but it is sometimes inherited (i.e. passed down from one generation to the next in a family). One in four cases of MTC occurs as part of a rare inherited disorder called Multiple Endocrine Neoplasia Type 2 (MEN2). All patients diagnosed with MTC are offered a DNA test for MEN2.

The thyroid is situated at the front of the neck. This gland produces three hormones: thyroxine and triiodothyronine (essential for maintaining the body's metabolism and mental and physical development); and calcitonin (which has no known action in healthy people).

For more information see the British Thyroid Association Patient Leaflet – The Thyroid Gland

MTC originates from the parafollicular cells (C cells) of the thyroid, which produce calcitonin. Calcitonin can be measured in the blood of patients with MTC and this is used by doctors to keep a check on the disease MTC usually develops over a number of years but it can spread early on to nearby lymph nodes. If the cancer is still contained within the thyroid you may have an operation to remove the thyroid gland (called a total thyroidectomy) and some of the lymph nodes in the neck (called a lymph node dissection) and need no further treatment. If the calcitonin level is still raised after surgery, this can mean that the cancer has spread (i.e. it has become metastatic) or it has not been completely removed, and you may need more surgery and treatments to control it.

There is not yet a definitive cure for *metastatic* MTC. However, it is often slow growing and can be managed effectively and without symptoms for many years. Symptoms that may develop can sometimes be controlled by the use of radiotherapy and/or chemotherapy.

There are new anticancer drugs called tyrosine kinase inhibitors (TKIs), which are becoming available for the treatment of various types of cancers, including metastatic MTC. However, their effectiveness in prolonging life is not yet known.

How is MTC diagnosed?

You may notice a lump in the neck, which was not there before, or this may be noticed by a partner or colleague. Sometimes the raised calcitonin level may cause diarrhoea, and it is not immediately apparent that this may be associated with a problem in the neck. A diagnosis of MTC may be confirmed by a fine needle biopsy, and ultimately by surgery. A blood test to measure calcitonin can sometimes be used to make the diagnosis of MTC, but levels may be raised for a variety of other

reasons, and so most specialists prefer not to use it for diagnosing MTC.

Can children have MTC?

It is rare for children to be diagnosed with MTC. Children who are diagnosed with MTC but who have no known family history of MTC should be seen by a genetics specialist to check whether they have MEN2 (an inheritable genetic disorder). If they have this condition they will need screening for other potential MEN2-related problems. A referral to a genetic counsellor at your Regional Genetics Service Centre should be made by your specialist or GP if appropriate.

What tests will I have for MTC?

You may have the following tests to confirm a diagnosis of MTC:

Blood tests: baseline calcitonin. This is a simple blood test to measure calcitonin levels, which are usually raised when MTC is present (note that once drawn, the blood must be taken immediately and on ice to a chilled centrifuge in the lab). However, it is not as reliable as other tests and is rarely used for diagnosing MTC in the UK.

Fine needle aspiration (FNA). This is done in a hospital outpatient clinic. A very thin needle is inserted into any swelling you may have in your neck and a sample of cells is taken out. These cells are then analysed under a microscope. This is a very reliable way of diagnosing MTC.

Thyroid ultrasound scan. A picture of the thyroid gland is obtained by using sound waves which will show any solid lumps or cysts. This cannot diagnose cancer on its own but it can help with the overall diagnosis and in planning treatment.

How is MTC treated?

MTC is different from other types of thyroid cancer. It is best treated in a hospital that is a centre of expertise for MTC, and by an experienced endocrine or head-and-neck surgeon who regularly operates on such patients.

Once a diagnosis of MTC has been made, you will have an ultrasound scan of your neck and sometimes a CT scan to try to determine how advanced the disease is. If there appear to be no enlarged lymph nodes, surgery to remove the thyroid and nearby lymph nodes (total thyroidectomy and central node dissection) is performed. If enlarged or involved lymph nodes are found, other lymph nodes will be removed at the same time.

If MTC is diagnosed before surgery, special blood and urine tests should be done (even if there is no family history of MEN2) to rule out the presence of a pheochromocytoma (adrenal gland growth) and overactivity of the parathyroid glands.

What will my scar look like?

During total thyroidectomy and central node dissection, a small incision is made at the base of the front of the neck through which the thyroid and nearby lymph nodes can be removed. A larger incision is required if the removal of other neck lymph nodes is necessary. Eating and drinking is possible almost immediately after waking from the operation.

How long will I stay in hospital?

You will usually stay in hospital for between 2 and 4 days depending on the extent of your operation.

What are the risks of the operation?

Thyroid surgery is generally safe but there are some possible risks you need to be aware of.

There is a risk of bleeding or infection in the days and weeks after the operation. There is also a risk of temporary voice change due to nerve injury, which in a few cases may become permanent (see below). Despite the surgeon's best efforts some people will have an unsightly neck scar (see below).

There is also a risk of injury to the parathyroid glands. This may be temporary or permanent and can affect the level of calcium in the body (see below).

Sometimes the lymph node removal is done along the side of the neck towards the ear on one or both sides. During this procedure there may be injury to the 'accessory nerve' (an important nerve in the neck which helps you to turn your head and shrug your shoulders) which may require physiotherapy.

Will it affect my voice?

The thyroid gland lies close to the voice box (larynx) and the nerves to the voice box. If you depend on your voice in your work or hobbies you should discuss this with your surgeon.

Before the operation you should have a vocal cord check. This involves spraying some local anaesthetic into your nose to make the procedure as painless as possible. A thin flexible camera (endoscope) is then gently passed into one nostril and from there down into your throat.

After your surgery you may find that your voice sounds hoarse and weak, and your singing voice may be altered. Temporary voice change can occur in up to 10% of cases, but permanent injury is uncommon and happens in less than two percent of cases. If this happens, ask your surgeon about possible treatment such as speech therapy or further surgery.

Will it affect my calcium levels?

The thyroid gland lies close to four tiny parathyroid glands. These glands, each about the size of half a pea, produce parathyroid hormone (PTH) that regulates levels of calcium in your blood. They may be affected during a thyroidectomy and may stop producing as much hormone as before. This is known as hypoparathyroidism. In 20–30% of cases this is temporary. In 5–10% of cases this may be permanent.

Without enough parathyroid hormone, your blood calcium levels may fall. Low calcium (hypocalcaemia) may mean you feel generally unwell or cause symptoms such as tingling in your lips or fingers or cramps. Either way, you should tell a doctor or nurse immediately. You will be given a blood test and, if low calcium is confirmed, some calcium via a drip or as a tablet.

Will I have neck stiffness, restricted shoulder movement or pain?

After the operation, you may feel some discomfort and stiffness around your neck but you will be given some medication to help ease this. Pain relief may be given as injections, liquid medicine or tablets. Most patients are up and walking around after the first day. After a few weeks your neck and shoulder movements should be back to normal.

If you have had more extensive neck surgery to remove some of your lymph nodes you may need to be referred to a physiotherapist.

For more information see the BTA Patient Leaflet – Thyroid Surgery

Will I need to take medication afterwards?

You will need to take levothyroxine tablets as prescribed by your doctor for the rest of your life. To make sure that you are on the correct dose, you will have regular blood tests to check that your thyroid hormone levels are within normal limits.

Doses are typically between 100 and 150 mcg a day for adults, lower for children.

Too high a dose of levothyroxine may cause symptoms such as rapid heartbeat, sweating, anxiety, tremor and loss of weight. Too low a dose may cause symptoms such as lethargy, slow heartbeat, sensitivity to cold, and weight gain. The same symptoms can also occur in other conditions, so you will need a blood test to measure the thyroid stimulating hormone (TSH) level to find out whether your levothyroxine dose needs to be changed. Once you are on a stable dose, as judged by blood tests, repeat tests usually only need to be done once a year in adults, or more frequently in children and teenagers as they grow.

If your parathyroid glands have been affected by surgery, you may need to take calcium carbonate supplements to maintain blood calcium levels until the parathyroid glands recover. A special type of vitamin D, such as Alfacalcidol or Calcitriol, in the form of capsules or drops, is used to help you absorb calcium from your diet if necessary. Treatment is usually temporary (up to 6 months).

If you begin to suffer from headaches, nausea and vomiting, this may mean that your calcium levels are too high and that the Alfacalcidol or Calcitriol is no longer needed. Too low a dose will lead to pins and needles or cramping in the hands or feet which may be temporary or may mean the dose needs to be increased. If you have symptoms you should see your doctor or nurse.

In some cases the parathyroid glands are permanently injured or removed during surgery and you will need to take calcium and vitamin D tablets for life. You should be referred to a consultant endocrinologist who will monitor your blood, bones and kidneys regularly and adjust your medication when necessary. Your GP will care for you between hospital appointments and will organise regular blood tests, particularly during medication adjustments. Once your levels are stable you should be able to lead a normal life.

What happens if the MTC has spread?

You may have high blood calcitonin levels even after complete surgical treatment. This indicates that there are MTC cells left in the body. However, patients with higher than normal calcitonin levels that remain the same over a period of time, or increase slowly, do not necessarily need further investigation or treatment. This is because calcitonin alone is not an indication of a growing tumour and scans are unlikely to identify a site of disease outside of the neck unless calcitonin levels are significantly high.

In some patients, however, the search for cancer that has spread (metastatic disease) may involve further tests. These may include ultrasound of the neck, CT scan, radioactive isotope scans or other types of scan. This may be followed by treatment with more surgery, radiotherapy or other radiation treatments (MIBG/Octreotide).

There are new anticancer drugs called Tyrosine Kinase Inhibitors (TKIs) which are becoming available for the targeted treatment of various types of cancers, including metastatic MTC. One of these, vandetanib, has been approved for use in the treatment of metastatic MTC in the UK. These drugs can cause significant side effects. Other TKIs are currently only available in clinical trials.

What are MIBG and octreotide therapies?

Where surgery is no longer an option, some specialised medical centres may use radiolabelled octreotide or MIBG (Meta-Iodo-Benzyl-Guanidine) radioactive therapies to help reduce or control the spread. However, these are only appropriate if tests suggest that the radioisotope will be taken up by the tumour. The agent is attached to a radioactive substance, and is given through a vein by slow injection. You will remain radioactive for a few days and will need to be nursed in a lead-lined room. The treatment may need to be repeated several times at 3 or 6 month intervals. There are few side effects to this therapy but you may experience some nausea, and occasionally vomiting. Patients usually tolerate these side effects well.

Until a complete cure is found, much of the current focus of treatment for extensive metastatic MTC is on the relief of the symptoms it causes:

Diarrhoea. You may need to adjust your diet and take an anti-diarrhoea medication such as Imodium, which contains loperamide. Some of the tumours contain somatostatin receptors, and in these instances treatment with a long-acting form of somatostatin (octreotide or lanreotide) may sometimes be helpful.

Flushes. Anti-ulcer medications called histamine receptor blockers (H₂ blockers such as cimetidine or ranitidine) may occasionally be prescribed to help ease flushing.

Pain. Painful bone metastases may be suitable for external radiation therapy, which can provide rapid relief. In all cases, pain medications may be prescribed.

Where can I get other help?

Free Prescriptions. Currently, patients in Scotland, Wales and Northern Ireland do not have to pay for their prescriptions. Patients in England taking lifelong levothyroxine or who are diagnosed with hypoparathyroidism are currently entitled to free prescriptions for all medicines. You should obtain the appropriate leaflet from your doctor who will sign it and send it on. You will then receive an exemption certificate, which you must show to your pharmacist when collecting medicines.

MedicAlert®. Anyone taking life-long medications should consider getting and wearing a MedicAlert® identification emblem. This contains summarised information of your medical condition and a 24-h Helpline number which emergency medical staff can call to get detailed information about your medical condition from the MedicAlert database.

This leaflet was adapted from the Association for Multiple Endocrine Neoplasia Disorders – AMEND – information resources by Jo Grey.

Patient support organisations

The following patient-led organisations collaborated in the preparation of this leaflet and each provides information and support and the chance to speak to other patients who have been through surgery and treatment for thyroid cancer.

Association for Multiple Endocrine Neoplasia Disorders – AMEND. AMEND provides information and support to families with multiple endocrine neoplasia (MEN) and associated endocrine tumours, including medullary thyroid cancer (MTC).

Address: The Warehouse, Draper Street, Tunbridge Wells, Kent TN4 0PG

Tel: 01892 516076

Website: www.amend.org.uk

Email: info@amend.org.uk

British Thyroid Foundation. The British Thyroid Foundation is a charity dedicated to supporting people with all thyroid disorders and helping their families and people around them to understand the condition.

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Address: 2nd Floor, 3 Devonshire Place, Harrogate, West Yorkshire GH1 4AA
Tel: 01423 709707/709448
Website: www.btf-thyroid.org
Email: info@btf-thyroid.org

Butterfly Thyroid Cancer Trust. Butterfly Thyroid Cancer Trust is the first registered charity in the UK dedicated solely to the support of people affected by thyroid cancer.

Address: PO Box 205, Rowlands Gill, Tyne & Wear NE39 2WX
Tel: 01207 545469
Website: www.butterfly.org.uk
Email: enquiries@butterfly.org.uk

Hypopara UK. Hypopara UK is the national patient organisation for people with parathyroid conditions, including post-surgical calcium issues and permanent hypoparathyroidism.

Address: 6 The Meads, East Grinstead, West Sussex RH19 4DF
Tel: 01342 316315
Website: www.hypopara.org.uk
Email: info@hypopara.org.uk

Thyroid Cancer Support Group – Wales. Supporting thyroid cancer patients and families not only in Wales but nationally and occasionally internationally. The group is funding the first national tissue bank specifically for research into anaplastic thyroid cancer.

Address: ‘Morcote’, Sunlea Crescent, New Inn, Pontypool, Gwent, South Wales NP4 8AD
Tel: 0845 009 2737
Website: www.thyroidsupportwales.co.uk
Email: thyroidgroup@tiscali.co.uk