
Parathyroid surgery at Massachusetts General Hospital:

Information for patients and families

We are pleased that you have chosen Massachusetts General Hospital to receive treatment for your parathyroid condition. This brochure gives some information about our program and answers some frequently asked questions about the parathyroid gland and parathyroid thyroid surgery. If there is anything you do not understand, please talk with your doctor.

Services at the MGH Endocrine Tumor Program

Patients are referred to Massachusetts General Hospital for evaluation and treatment of a number of conditions. Through our program, your care will be coordinated by a team of highly trained physicians who are specialists in the treatment of both thyroid and parathyroid glands. You will be pleased to know that the MGH has a long history of parathyroid surgery and many of the pioneers of parathyroid surgery were at the MGH.

- 1926- Dr. Churchill at the MGH first attempted parathyroid surgery in the United States for primary hyperparathyroidism
 - 1976: Dr. C.A. Wang at the MGH first proposed that a smaller incision and exploration may be adequate in some patients with hyperparathyroidism.
 - 1988- Dr. Nussbaum at the MGH first described the utility of testing the blood hormone level for parathyroid hormone during the surgery to assess the success of parathyroid surgery
-
- Our endocrine surgeons are highly experienced and serve as a referral center not only for those with primary hyperparathyroidism but also for those patients with previously unsuccessful parathyroid surgery or those with recurrent hyperparathyroidism. Our center has extensive experience in outpatient surgery for selected patients, small incisions and surgery performed under local anesthetic when possible, as well as use of minimally invasive and parathyroid hormone monitoring during the operation. Our staff is experienced in treating patients with MENI and MENII syndromes, hyperplasia (including those with renal disease), and parathyroid cancer and mediastinal adenomas.

What is the parathyroid gland?

The parathyroids are actually 4 small glands located behind the thyroid gland in the neck. They are each about the size of a small pea. These small glands perform a very important function by secreting a hormone, called parathyroid hormone (PTH), which regulates the amount of calcium and phosphorous in the blood. The normal function of these glands result is a blood level of calcium that stays within a very narrow range.

Blood calcium levels above this normal range can lead to major problems including kidney stones. Calcium is critically important in the body, playing a vital role in maintaining the normal function of nerves and muscles, as well as keeping bones strong. PTH causes calcium that you eat in your diet to be absorbed from your intestines and if that is not enough, then PTH will cause release of some additional calcium from the bones. It regulates the amount of calcium that the kidneys excrete into the urine as well. If one or more of the parathyroid glands get enlarged they can produce too much parathyroid hormone and this can result in too much calcium in the blood. Sometimes, a person is born with more than 4 glands, or the glands are located in unusual places such as inside the thyroid gland, in the chest, or in other locations.

Why is parathyroid surgery performed?

Most commonly, parathyroid surgery is done when one or more of the parathyroid glands have become enlarged and are making too much PTH. Too much PTH leads to high blood calcium levels (hypercalcemia). Most often, only one of the parathyroid glands is enlarged, this is a benign growth – that is, it is not cancer – and is called a parathyroid adenoma. In some patients benign enlargements occur in more than one parathyroid gland at the same time, a condition called parathyroid hyperplasia. Very rarely (in 1% of cases), enlargement of the parathyroid is because of cancer. There are other much less common conditions such as renal failure, dialysis, lithium use or genetic conditions that also can cause the glands to increase in size and produce too much hormone.

Surgery to remove the enlarged gland or glands which are producing too much PTH is the only treatment for most types of parathyroid enlargement, since too much PTH can lead to major imbalances in the blood calcium levels. Certain rare disorders may be treated without surgery. Surgery is recommended to all patients who have more than mild elevations in blood calcium levels, and to any patient who has symptoms of high blood calcium, which may include: weakness, fatigue, low energy, confusion, memory loss, loss of appetite, constipation, thirst, excessive urination, kidney stones, thinning of bones (osteoporosis), or inflammation of the pancreas.

How long will I be in the hospital for parathyroid surgery?

You will be admitted to the hospital on the morning of your surgery. Many patients are able to go home the same day after about 4-6 hours in the recovery room. Others stay overnight in the hospital. A bed is reserved for you to spend the night in case it is necessary.

What is done during parathyroid surgery?

Parathyroid surgery is very delicate and important decisions will be made along the way about your parathyroids that require both experience and expertise; this is why it is important to have your parathyroid surgery at a center with experienced surgeons. During the surgery, the surgeon will make an incision in the neck along the collar

line. The surgeon will explore the area to locate one or all of the parathyroid glands. Any abnormal gland will be removed. If all the parathyroid glands are abnormal, the surgeon will most likely remove 3 glands completely, and will leave ½ of the remaining gland in the body. This partial gland will likely be able to produce enough PTH for the body's needs.

Tests done before the operation may point clearly to one or multiple glands as the source of the problem. The surgeon may also be able to tell just by looking at the glands which one(s) are abnormally enlarged. Sometimes, the surgeon may analyze your blood level of PTH during the surgery (Intraoperative PTH monitoring). After one of the glands is removed, the surgeon will check to see if there has been a noticeable effect on the PTH level in the blood. This is another way the surgeon can confirm that the actual gland causing the problem has been removed.

Occasionally, despite careful surgery by an experienced surgeon, no abnormal gland is found. This may be because there are abnormal glands at an unusual location in the body. If this happens, your surgeon may order additional tests to try and pinpoint the source of the problem.

What type of anesthesia will I have?

Most patients have general anesthesia for parathyroid surgery. With general anesthesia, you are completely asleep during the operation, but once you wake up you are quiet awake. In some cases, parathyroid surgery can be done using a local anesthetic. With this approach, you are awake but very sleepy from sedatives given through an intravenous (IV) line. Local anesthetic (similar to Novocaine) is injected into the neck so that you do not feel any pain during the surgery. You will meet with an anesthesiologist before your surgery who will talk with you about the type of anesthesia you will have. You will have experienced anesthesia staff monitoring you carefully while you are asleep and under anesthesia. You will meet with an anesthesiologist prior to your surgery who will spend time talking with you about details; it is important that you mention any previous anesthetics you have had and whether you had any problems or issues.

What must I do to prepare for surgery?

Most patients who are young and/or relatively healthy will be scheduled for a pre-operative phone interview with a nurse from the preoperative anesthesia staff. In some cases, you will have to come to the hospital for this interview and for any other tests that may be necessary, such as blood tests, X-rays, or an EKG. In other cases, the interview can be done over the phone. Your surgeon's office will give you more information about your pre-operative interview. Please be prepared to give any information about your previous anesthetic experiences to your anesthesiologist, this information is critical to them. If you are coming to the hospital for the interview, you will meet an anesthesiologist at that time. If your interview is over the phone, you will meet the particular anesthesiologist that will help your surgeon on the morning of

your surgery.

During your pre-operative interview, the nurse will explain what you need to do in order to prepare for your surgery. Make sure you understand all of the instructions you are given. Examples of some important instructions are:

- Do not eat or drink anything after midnight on the night before surgery. You may take your routine medicines (such as heart, blood pressure, or asthma medicine) on the morning of surgery with a small sip of water.
- Stop taking aspirin and other blood-thinning products 7-10 days before surgery, unless otherwise directed by the nurse, your doctor or your cardiologist.
- If you take medicine for diabetes, make sure you understand how to adjust your medicine on the day of surgery when you will not be eating.

Will I have pain after the operation?

You will have some pain, but this can be treated very effectively with oral pain medicine. As you recover, you may have a sore throat, difficulty swallowing, or a hoarse voice. These things will get better very quickly.

What medicines will I have to take at home after surgery?

In most cases, you will go back to taking any daily medicines you were on before surgery. As noted above, pain medicine will be added for a few days.

Sometimes, additional medicines are needed. For example, it may take some time following surgery for the remaining parathyroid gland(s) to be able to properly regulate calcium or phosphorous levels in the blood. Your bones may also feel hungry for additional calcium after the surgery, depending on how long standing your parathyroid disorder has been. Your doctor may prescribe calcium and Vitamin D after your surgery. Usually, these medicines can be discontinued after 2-4 weeks. Rarely, they need to be continued for life.

What is done with the parathyroid tissue that is removed?

The tissue is sent to the pathology lab for examination. A pathologist will look at the tissue under a microscope to see if there are any abnormalities, including cancer. It takes about 3-5 business days to get these results. Frozen sections are rarely performed for parathyroid surgery. Your surgeon will go over the results in detail with you when you come back for your follow-up appointment.

How will I feel after the surgery?

You will be somewhat sore and will have trouble moving your neck normally for about a week. As noted above, pain medication is very effective in controlling this discomfort. Some patients may have minor muscle spasms in the upper back and neck. It will be important for you to keep these muscles relaxed and to maintain normal posture as much as possible. It helps to perform gentle neck stretch exercises.

You should feel better every day. Most patients can return to work 1-2 weeks after surgery. You should be able to drive in about a week – as long as you can turn your head comfortably and are not taking pain medicine. You can swim and return to non-strenuous exercise (tennis, golf, walking, and treadmill) after 2 weeks. You can return to all your normal activities by 1-3 weeks after parathyroid surgery.

What medicines will I have to take at home after surgery?

In most cases, you will go back to taking any daily medicines you were on before surgery. As noted above, pain medicine will be added for a few days.

Sometimes, additional medicines are needed, including:

- Calcium and Vitamin D – Sometimes after parathyroid surgery your calcium levels may become abnormally low. Your surgeon may recommend that you take calcium and vitamin D supplements after surgery. Usually, these can be stopped after a short period of 2-4 weeks. Rarely, they must be taken permanently.

Are there other side effects of surgery?

As noted above, in some cases your blood calcium levels may drop. You may be asked to watch for signs of low calcium, which include numbness and tingling in the fingers and around the mouth or muscle cramps. Your surgeon will tell you what to do if low calcium becomes a problem.

You may also experience some symptoms that are common after almost any operation, such as loss of appetite, constipation, being tired, needing to take extra naps or having trouble sleeping or concentrating. These are normal reactions to surgery and should pass in a short time. If they do not, please tell your surgeon.

Will I lose my voice after parathyroid surgery?

The surgeon is working very carefully and gently around the area where your voice box nerve travels under the thyroid and parathyroid glands. The likelihood of having a significant voice change after parathyroid surgery is very low. Your voice may sound somewhat different for a while after the surgery, but this doesn't happen to everyone. Some patients are a little hoarse and some have "voice fatigue," meaning their voice is "tired" at the end of the day. In most cases, these changes go away in 6-8 weeks. In a small number of patients (less than 1%), changes in the voice are permanent. If this happens, treatments are available that may help improve the quality of the voice.

Will I have a scar in my neck?

Having a nice cosmetic result is important to you and your surgeon! You will have scar, but your surgeon will take great care to make sure it is as small as possible. The incision is placed in the lower neck. Lots of care will be taken by your surgeon to minimize scarring, and plastic surgery techniques will be used to close your incision. Ultimately the type of scar formed depends mostly on your own body. Your incision will be closed with stitches placed under your skin that are not visible. These stitches dissolve after a period of time and do not need to be removed. Strips (Steristrips or butterfly strips) may be placed on your incision to help healing and for protection. It is best if you do not peel these off. Once these strips fall off or are removed by your surgeon, you can apply a small amount of vitamin E containing lotion over the incision. In the early weeks and months following your surgery, the scar will be much more noticeable than it will be later. It is natural to get some swelling around the scar, and to see a healing “ridge” form above and below the area. A small amount of bruising is normal as well. Over time, the scar will fade. It may take up to 6 months, but in most cases the scar lightens to where it is barely noticeable. The majority of people having parathyroid surgery are very pleased with the minimal scar present at 6 months after surgery.

Use this space to write down the date and time of your surgery and your preoperative interview. If you have any questions, please ask someone in your surgeon's office.