

# Parathyroid Disease: When Elevated Calcium Requires Surgical Consultation

By Natalya Chernichenko, MD, FACS

**P**arathyroid glands are four tiny glands, each about a size of a grain of rice, located in the neck behind the thyroid gland. Parathyroid glands play an important role in regulating the amount of calcium in the body by producing parathyroid hormone (PTH). When parathyroid gland becomes overactive, it produces too much PTH which leads to elevated calcium level.

Overactive parathyroid gland due to tumor is known as primary hyperparathyroidism. Most parathyroid tumors (adenomas) are not cancerous. Parathyroid cancer is a rare condition and occurs only in about one percent of people with primary hyperparathyroidism. Hyperparathyroidism brought on by another condition, such as kidney failure or low Vitamin D level, is called secondary hyperparathyroidism. Symptoms of elevated calcium are classically summarized by "stones, bones, abdominal groans and psychiatric overtones". "Stones" refer to kidney stones. "Bones" refer to bone-related complications, such as bone pain, osteoporosis and even pathological fractures. "Abdominal groans" refer to gastrointestinal symptoms of indigestion, constipation, nausea and vomiting. "Psychiatric overtones" refer to fatigue, depression, memory loss, problems with concentration and even psychosis.

We diagnose parathyroid disorders through comprehensive testing that starts with complete history and physical exam. Diagnosis of type of hyperparathyroidism is based on blood work that includes levels of calcium, PTH and Vitamin D, and a 24-hour urine test. Imaging tests that we may recommend include thyroid and parathyroid ultrasound, sestamibi scan and a CT scan. When intravenous contrast cannot be administered due to allergies or kidney

problems, MRI may be recommended.

Many patients with parathyroid tumors elect to undergo surgery so that they do not develop complications from their parathyroid disease. Active surveillance for noncancerous parathyroid tumors is another option. This approach involves close monitoring. In general surgery is offered to the patients who are young in age (less than 50), have osteoporosis or fractures due to decreased bone density, have history of kidney stones, very high calcium level and have reduced kidney function.

Parathyroid surgery takes place in the operating room under general anesthesia. Surgery involves removing parathyroid tumor while protecting nerves that cause movement of vocal cords. The "gold standard" operation for primary hyperparathyroidism for almost one hundred years has been four-gland parathyroid exploration. This surgery involves examining all parathyroid glands. Once identified, abnormally enlarged parathyroid glands are removed and wound is closed with sutures. Minimally invasive parathyroid surgery was introduced in 1980's and gained acceptance during 1990's. Currently the success rate for minimally invasive parathyroid surgery equals that of the more conventional four gland exploration when performed appropriately. Minimally invasive technique offers many advantages, including less pain after surgery, reduced scarring and faster recovery time. With minimally invasive technique, the surgeon removes the enlarged parathyroid gland that had been identified by imaging studies performed prior to surgery. Instead of looking at all four glands, PTH is measured before and after removal of the gland. If PTH level decreases appropriately, suggesting that other glands are normal, the operation is concluded. Surgery is the only cure for primary hyperparathyroidism. It has high success rate, is low risk, and very well tolerated.

If you are diagnosed with elevated calcium due to parathyroid disease, we will work with you to determine the best diagnostic and treatment approach.

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