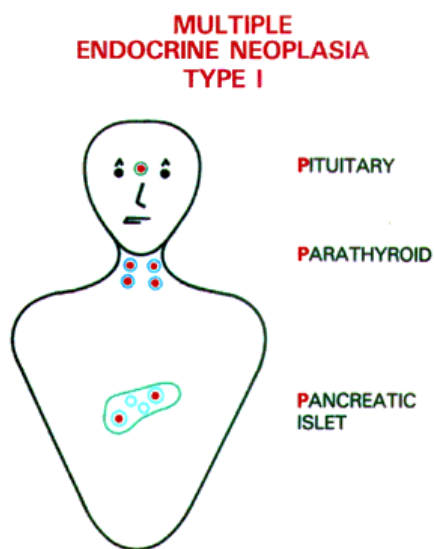




## Hyperparathyroidism and Kidney Stones



Since the parathyroids are the endocrine glands earliest and most often affected by MEN1, families and people most susceptible, those within family groups with a diagnosed case of MEN should be most alert about the dysfunction of the parathyroid glands. The human body normally has four parathyroid glands, which are located in the folds of the thyroid gland in the front of the neck. In about 5% of people there is a 5<sup>th</sup> parathyroid gland in the folds of the Thymus Gland, located below the neck behind the upper sternum. The parathyroids release into the bloodstream a chemical called parathyroid hormone, or parathormone, which helps maintain a normal supply of calcium and phosphate in the blood, bones, and urine.

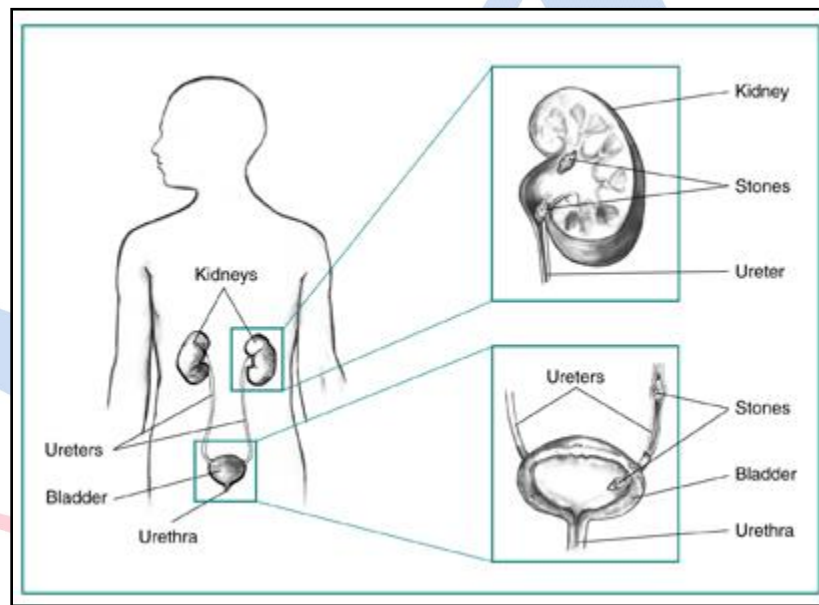
In MEN1, gradually all four parathyroid glands tend to become overactive. They release too much parathyroid hormone, leading to excess calcium in the blood. High blood calcium, known as hypercalcemia, can exist for many years before it is found by accident or by family screening. Unrecognized hypercalcemia can cause excess calcium to spill into the urine, leading to kidney stones or kidney damage and in some cases osteoporosis of the bones. Many people with MEN1 have initial symptoms of kidney stones, almost always calcium oxalate, a crystalline compound formed by calcium and oxygen with uric acid as the reagent. With high blood calcium and high uric acid levels, kidney stones can continue to form over the years. The author has passed over 15 kidney stones over the years, plus has had two cystoscopic basket extractions and a lithotripsy.

Nearly everyone, an estimated 90-95% of people who inherit the susceptibility to MEN1 will develop overactive parathyroid glands (hyperparathyroidism) by age 50, but the disorder can often be detected before age 20. Hyperparathyroidism may cause no problems for many years or it may cause problems such as tiredness, weakness, muscle or bone pain, constipation, indigestion, kidney stones, or thinning of bones.

It is sometimes difficult to decide whether hyperparathyroidism in MEN1 is severe enough to need treatment, especially in a person who has no symptoms. The usual treatment is an operation to remove the three largest parathyroid glands and all but a

small part of the fourth, which is usually marked with a tag. After parathyroid surgery, regular testing of blood calcium should continue, since the small piece of remaining parathyroid tissue can grow larger and cause recurrent hyperparathyroidism. People whose parathyroid glands have been completely removed by surgery must take daily supplements of calcium and vitamin D to prevent hypocalcemia (low blood calcium). If the calcium levels fall too low, the body enters a seizure-like state called “tetany.”

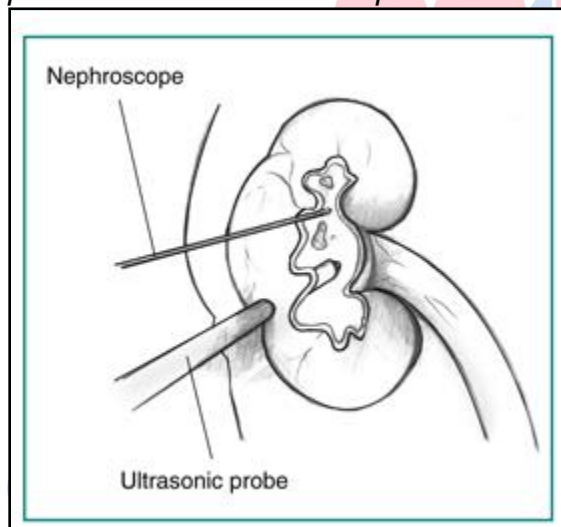
Kidney stones, the most frequent manifestation of hyperparathyroidism, cause acute pain in the person's flank where the stone is being passed. The stones pass into the mouth of the ureter, proceed down the ureter, and frequently get hung up when the ureter makes a turn toward the bladder. When the stone gets hung in the ureter, the flow of urine from the kidney is blocked and the kidney goes into spasms. The pain is exquisite. Most physicians correlate the pain to that of childbirth or even worse. If a kidney stone is too large to pass through the ureters into the bladder, there are several options physicians can use to remove them.



There are several treatment options Urologists will present to a person with a kidney stone in the ureter. First is to medicate the patient with pain killers, frequently Demerol with Phenergan, and hope the patient passes the stone without intervention. Demerol is a strong pain killer and Phenergan is an antihistamine which also treats nausea and vomiting or pain. It is also used as a sedative or sleep aid. Depending on the level of pain, the level of Demerol can be as high as 150 mg and usually 50 mg of Phenergan. The Urologist then has the nursing staff observe the patient and orders fluids, most likely a normal saline drip augmented by forcing oral fluids. If the stone does not pass within a reasonable period of time, then there are several internal interventions. First is removal by a ureter scope with a “basket” on the tip. The patient is given a mild anesthetic and the Urologist inserts the ureter scope through the Urethra and into the ureter then pulls the stone out. Rarely, Urologists may use the focused Lithotripsy to pulverize the stone in the ureter. There are also medications which may be used to “relax” the ureters and allow the stone to pass more easily. Tamsulosin has been used with some level of effectiveness.

Frequently, kidney stones form in the kidney which are simply too large to pass. For over 20 years, Urologists have used shock wave lithotripsy. A machine called a lithotripter is used to crush the kidney stone. The procedure is performed by an urologist on an outpatient basis and anesthesia is used. In shock wave lithotripsy, the person lies on a table or, less commonly, in a tub of water above the lithotripter. The lithotripter generates shock waves that pass through the person's body to break the kidney stone into smaller pieces to pass more readily through the urinary tract. Possible complications of lithotripsy is that small particles of stones may not all pass, and become the "seeds" for more kidney stones.

Another way physicians treat kidney stones inside the kidney too large to pass is to use percutaneous nephrolithotomy. In this procedure, a wire-thin viewing instrument called a nephroscope is used to locate and remove the stone. The procedure is performed by an urologist in a hospital with anesthesia. During the procedure, a tube is inserted directly into the kidney through a small incision in the person's back. For large stones, an ultrasonic probe that acts as a lithotripter may be needed to deliver shock waves that break the stone into small pieces that can be removed more easily. The person may have to stay in the hospital for several days after the procedure and may have a small tube called a nephrostomy tube inserted through the skin into the kidney. The nephrostomy tube drains urine and any residual stone fragments from the kidney into a urine collection bag. The tube is usually left in the kidney for 2 or 3 days while the person remains in the hospital.



The best way to prevent kidney stones is to undertake personal lifestyle changes to reduce blood calcium and uric acid. Even people with hyperparathyroidism can reduce their risks. The National Kidney and Urologic Diseases Information Clearinghouse, administered by the National Institutes for Health (NIH), from which I borrowed some of the diagrams and information for this information, recommends the following for calcium oxalate stones.

- ♣ reducing sodium
- ♣ reducing animal protein, such as meat, eggs, and fish

- ✧ *getting enough calcium from food or taking calcium supplements with food*
- ✧ *avoiding foods high in oxalate, such as spinach, rhubarb, nuts, and wheat bran*

*Then, of course, is the basic action of drinking plenty of fluids, especially water, and avoiding dehydration.*

*Another way to reduce the incidence of kidney stones is to frequently monitor your parathyroid functions, and when indicated, have surgical intervention. Once you have surgical intervention of your parathyroid tissue, which is no guarantee that it will not reoccur. As long as you have parathyroid tissue in your body, it will be susceptible to growing adenomas and raising your blood calcium. That is the process of MEN1.*

*Finally, if you need surgery on any of your endocrine glands, including the parathyroid glands, we recommend that you use an endocrine surgeon experienced in these particular kinds of surgery. Using your local general surgeon or oncology surgeon is simply inviting complications and poor results. The outcomes of experienced endocrine surgeons in performing surgery on MEN1 patients are much better than someone inexperienced.*

*This article is an information support service of your American Multiple Endocrine Neoplasia support team at <http://www.amensupport.org/>. I have written it at a non-professional level, so anyone can understand it. If the reader has any questions, contact us.*

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