

## Minimally Invasive Thyroid and Parathyroid Surgery



By: James Bredenkamp M.D., F.A.C.S.

Minimally invasive endocrine surgery of the neck has undergone a dramatic evolution over the past decade. Novel diagnostic and therapeutic tools have been developed in the treatment of thyroid nodules and cancers, and diseases of the parathyroid glands. New technologic and minimally invasive techniques allow patients to benefit from reduced dissection, smaller and more cosmetic incisions, reduced hospital admissions or more often outpatient surgery, and faster recovery times.

### Minimally Invasive Thyroid Surgery

Thyroid surgery is most often done for thyroid cancer or the suspicion of thyroid cancer. Other reasons to remove part or all of the thyroid gland are large, benign thyroid glands (goiter) that cause problems with swallowing or breathing or are cosmetically unattractive. Surgery may also be recommended in some forms of hyperthyroidism (Grave's Disease or toxic multinodular goiter) that do not respond to anti-thyroid medications or radioactive iodine, or those patients who are allergic to the medicine, or do not want or cannot take radioactive iodine (pregnancy).

When a thyroid nodule is identified, depending on its size, an ultrasound guided needle aspiration (FNA) may be recommended. In general, those nodules less than 1.5 cm can be followed for growth in patients with no risk factors for thyroid cancer (family history of thyroid cancer, history of head and neck radiation, extremes of ages, or male sex). **In patients with thyroid cancer risk factors and nodules 1.0 cm or more, or in all patients with nodules 1.5 cm or more, ultrasound FNA is recommended.**

If the FNA shows cancer or an indeterminate result, thyroid surgery is recommended. New molecular markers are on the horizon to increase the sensitivity of FNA.

**Thyroid nodules and thyroid cancers are more prevalent today, and in the last two decades, the incidence of thyroid cancer has doubled. Among women, it is the cancer with the fastest rising number of new cases.** Despite this explosion in new cases, survival from differentiated thyroid carcinoma (Papillary and Follicular carcinoma) remains excellent. The mainstay of treatment is surgery to first remove all the thyroid tissue in the neck including cancerous and normal thyroid tissue as well as any cancer that has spread to other sites or lymph nodes. Once all the good and bad thyroid tissue has been removed, radioiodine therapy can be given, and this combination of therapy is what gives thyroid cancer such a good prognosis.

Contemporary thyroid surgical management includes partial or total thyroidectomy and if necessary selective neck dissection and organ preservation surgery of the trachea, larynx and esophagus. Today vocal cord nerve damage and voice problems following surgery are low because of the use of intra-operative laryngeal nerve monitoring. This involves the continuous monitoring of the recurrent laryngeal nerve with the use of spontaneous electromyography during the dissection and provides function assessment pre and post-resection. It is very helpful intra-operatively in identifying the nerve. New specialized and lighted retractors also aid in the dissection. Depending on the extent of disease, many thyroid surgeries can now be performed through a small incision, and an increasing number of cases as an outpatient.

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## Minimally Invasive Parathyroid Surgery

Primary hyperparathyroidism (HPT) is caused by over-activity of one or more of the parathyroid glands leading to an increase in parathyroid hormone (PTH), an increase in serum and urine calcium levels, and a decrease in bone density. Its prevalence is about one in 500 women, and one in 2000 men.

Today, the majority of patients with HPT have few overt symptoms; however when questioned more closely, 80% will have vague complaints including:

- » Fatigue
- » Weakness
- » Bone pain
- » Depression
- » Memory loss
- » Decreased concentration
- » Sleep disturbances

Many patients who do not complain of symptoms before surgery report significant improvement in their overall well-being after surgery. Other patients will have the more typical issues with nephrolithiasis, osteoporosis and various cardiovascular conditions.

The diagnosis of HPT is biochemical, with its hallmark being elevated serum calcium and PTH levels. Vitamin D and 24-hour urine calcium levels are often useful to firm up the diagnosis. The next step is to find the offending gland or glands. Whereas in years past, it was said that the only important localization study was to find a good surgeon, today parathyroid sestamibi scanning and ultrasonography used together are highly sensitive in helping the surgeon localize the abnormal parathyroid gland preoperatively and minimize the surgical dissection. During surgery, the surgeon can determine the adequacy of resection of parathyroid tissue by checking intra-operative PTH levels after surgical resection of the suspected gland(s). It is said that it is the preoperative localization studies that tell the surgeon where to look, and the intra operative PTH levels that tells the surgeon when to stop.

Today, parathyroid surgery is frequently done through a limited 2 cm incision as an outpatient. Patients enjoy a quick recovery with minimal pain and highly predictable results. As with thyroid surgery, injury to the vocal cord nerves is rare with the used of intra-operative nerve monitoring.

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## About the Author

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Dr. Bredenkamp received his Medical Degree from the University of California, San Francisco School of Medicine. He then went on to complete a six year Residency in the Department of Surgery at the University of California, Los Angeles School of Medicine. Dr.

Bredenkamp's surgical training included two years of General Surgery and four years of Head and Neck specialty surgery. He also spent one year in basic research, studying the immunology of cancer. Dr. Bredenkamp is Board Certified in Otolaryngology/Head and Neck Surgery and a Fellow of the American College of Surgeons.

He is the author of over twenty scientific papers and has written five book chapters. Dr. Bredenkamp is a contributing author to *MedicineNet.com* and chief editor of *FocusOnHearing.com*. He has served as the Chief of Surgery at Mission Children's Hospital, the Chief of Otolaryngology at Mission Hospital and Saddleback Hospital and the Medical Director of the Mission Ambulatory Surgicenter. Dr. Bredenkamp was recently selected as one of the "Best Doctors" in his specialty by *Consumers' Guide to Top Doctors*.

His professional interests include adult head and neck oncology, endocrine surgery, facial reconstruction and pediatric surgery/otolaryngology.

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