

**ADVANCES IN PAROTIDECTOMY AND
MINIMALLY INVASIVE THYROIDECTOMY PROCEDURES
UNIVERSITY OF CALIFORNIA – SAN FRANCISCO MEDICAL CENTER
SAN FRANCISCO, CALIFORNIA**

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ANNOUNCER: This program is sponsored by Ethicon Endo-Surgery, Incorporated. Over the next hour, you'll have the opportunity to see an expert clinical discussion and presentation on advances on parotidectomy and minimally invasive thyroidectomy procedures live from the University of California- San Francisco Medical Center. During the program, surgeons Dr. Lisa Orloff and Dr. David Terris will demonstrate the techniques of these procedures. The webcast will feature the use of Harmonic technology that aids parotidectomies and thyroidectomies. OR-Live makes it easy for you to learn more. Just click on the "Request Information" button on your webcast screen and open the door to informed medical care. OR-Live: The vision of improving health.

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LISA A. ORLOFF, M.D., F.A.C.S.: Hello and welcome. We're coming to you live from the Helen Diller Family Comprehensive Cancer Center at the UCSF Medical Center in San Francisco, California. I'm Dr. Lisa Orloff, your host for the program. I'm the Robert K. Werbe Distinguished Professor of Head and Neck Cancer and the Chief of the Division of Head & Neck & Endocrine Surgery here at UCSF. I'm joined today by my friend and colleague, Dr. David Terris, who's from the Medical College of Georgia in Augusta, Georgia. Dr. Terris is a head and neck surgeon and chair of the department at the Medical College of Georgia. He's the surgical director of the MCG Thyroid Center and his practice is limited to thyroid and parathyroid surgery. He is particular expertise in minimally invasive and outpatient thyroid and parathyroid surgery. Welcome Dr. Terris.

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DAVID J. TERRIS, M.D., F.A.C.S.: Thank you, Lisa. It's great to be here.

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LISA A. ORLOFF, M.D., F.A.C.S.: Good to have you. Yeah. We're going to talk today on advances in parotidectomy and minimally invasive thyroidectomy procedures and later in the program we'll be presenting video segments of actual parotidectomy and thyroidectomy cases performed by Dr. Terris and me. But before we get started, I have just a few housekeeping items. First, we'll be answering email questions from the audience, so please send us your questions now or during the broadcast. To do so, just click the question button on your webcast screen. We welcome all questions and we'll try to answer all of them during this live program. Second, an archive of this program will be posted on this website later this evening and can be accessed through the website, should you wish to watch the presentation again or send it to a colleague. So let's begin. I'm going to speak on contemporary management of parotid gland neoplasms. As most head and neck surgeons know, salivary gland neoplasms are fairly uncommon neoplasms,

representing only about five percent of head and neck cancers and less than one percent of all tumors. These tumors involve both the major and the minor salivary glands and they're a heterogeneous group of tumors. Fortunately, most parotid gland tumors are benign and this is the major salivary gland, where most neoplasms occur. Only about 20 percent of parotid tumors are malignant. But malignant parotid neoplasms can have a similar manner presentation to benign lesions. Most parotid tumors do present as an asymptomatic mass in the superficial lobe of the parotid gland. Other features that raise the suspicion of malignancy include pain, facial nerve weakness, sensory loss, trismus, or palpable lymphadenopathy. The older an individual, the more likely or the higher the suspicion for a malignant lesion. There can be malignant lesions in the parotid gland that are metastatic from a distal primary site and the most common site of origin for a metastases to the parotid gland are actually a fairly regional site, the skin of the face and scalp as depicted here. This photograph is of a gentleman who had a previous squamous cell cancer removed from his forehead, like many other skin cancers that he'd had dealt with, and he presented in a delayed fashion with a parotid mass shown on the ultrasound on the right here with a metastatic parotid node. Imaging studies can be very useful in the workup of the parotid lesion, although they are not mandatory. Ultrasonography, CT scanning, and MRI can be helpful, and I find in particular useful in the setting of malignant neoplasms or recurrent neoplasms. When there are large neoplasms or tumors that appear to involve the deep lobe of the parotid gland. When there's decreased mobility of a tumor or suspected parapharyngeal space involvement. Here you can see some ultrasound examples of both benign and malignant parotid tumors. The features on ultrasound are not pathognomonic but do help to delineate the extent of the tumor and the characteristics including size, vascularity, whether there's involvement of the deep lobe. The deep lobe is a little bit less easily visualized by ultrasonography, due to interference by the mandible and the mastoid. But the parotid itself is relatively accessible to ultrasonography during the initial workup. If further imaging is considered, the use of CT or MRI can help better define tumor location and extent, extent of parotid gland involvement or extension beyond the parotid gland. Certain features such as an infiltrative growth pattern or such extent that facial nerve encasement is suspected. Imaging can also be helpful in assessing lymph node metastases. Here you can see an axial MRI scan of a deep lobe parotid tumor that was not easily detected by physical examination alone. The tumor did not present by palpation but rather by pharyngeal symptoms and this is a deep lobe pleomorphic adenoma that is well assessed by MRI. I tend to use parotid fine needle aspiration biopsy when I'm working up a parotid lesion, although this is a controversial subject. The use of FNA can help to establish the need for surgery, rather than the definitive diagnosis and I find it helpful to rule out the need for surgery in select patients, such as those with reactive interparotid lymph nodes or lymphoma or non-neoplastic disorders of the parotid or salivary glands. Parotid FNA can help to guide other imaging studies, consultations, and extent and timing of surgery, should it be necessary. It really should contribute to but not displace the overall diagnostic impression. So, although we may have been taught that fine needle aspiration biopsy in salivary neoplasms is fairly inaccurate, more recent studies have cited, based on large numbers, an accuracy rate of 90 percent or better, especially in the hands of experienced cytopathologist. In order to obtain accurate diagnoses, adequate tissue sampling is certainly necessary. I find that image guidance is often helpful, using either

ultrasound or CT scan to guide fine needle aspiration biopsy of the parotid. Again, the FNA should be correlated to the clinical situation. So once the need for surgery has been established, there are certain guiding principles in performing safe parotidectomy. These include ensuring adequate exposure of the facial nerve, as well as the tumor to be resected. There are multiple sound methods of dissection and I'm going to present my preferred methods today, although the approach used may be dictated in part by the tumor and many surgeons can perform this procedure safely with their own preferred algorithm. But I think it's essential to ensure complete tumor removal, both in benign and malignant tumors, wherever possible, to protect the facial nerve and minimize patient morbidity. There are certain reliable landmarks in identifying the facial nerve during parotidectomy, and in order for most consistent to less consistent are the digastric muscle, which certainly helps to identify the plane of the facial nerve and is part of the early dissection, and the tympanomastoid suture, which is a palpable landmark, whereby the facial nerve tends to be within a centimeter medial to the tympanomastoid suture. The tragal pointer is another helpful landmark and the facial nerve tends to be just medial and anterior and inferior to this cartilaginous landmark, and where all of these landmarks together fail to help identify the facial nerve trunk, it is possible to identify a peripheral facial nerve branch and dissect it in a retrograde fashion until the main trunk can be identified. This can be useful in peripheral neoplasms or in reoperative settings. Finally, when a tumor extends proximally, it may be necessary or helpful to drill out the mastoid bone and find the intratemporal portion of the facial nerve. So this is a picture of my standard parotidectomy incision and as you can see this patient also has facial nerve electrodes for facial nerve monitoring. This is another optional component of parotid surgery. I happen to find that facial nerve monitoring is helpful. I don't know about you, Dave, whether you use it during a parotid.

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DAVID J. TERRIS, M.D., F.A.C.S.: Yes, I do use it, Lisa. I agree. I find it helpful in a certain percentage of cases. But you never know when it's going to be that difficult case, so I use it routinely on all my cases.

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LISA A. ORLOFF, M.D., F.A.C.S.: Yeah, and I think it really adds very little time to the case. Usually the technology is available in the operating room anyhow and it adds no morbidity. So it can be helpful in tracing out peripheral branches of the facial nerve. In the patient depicted here, there are a couple of small skin lesions and since the patient does have actinic damage to the skin and some history of skin cancer, we elected to incorporate those lesions into the dissection. So once I've made my skin incision and elevated my flaps, I tend to identify the anterior border of the sternocleidomastoid muscle and free the tail of the parotid gland from that location. The diagram here actually depicts transection of the great auricular nerve, but I find that in more than 50 percent of cases, I can preserve that nerve with just a little bit of extra dissection and effort, at least the posterior branch can be preserved and I do think that that enhances quality of life. Patients often do complain about the numbness in their ear when the nerve is transected. So it's well worth the effort and after identifying the sternocleidomastoid muscle, I attempt to free the tail of the gland further from the digastric muscle and this certainly helps to identify the plane in which to expect the facial nerve trunk. Simultaneously or subsequently I open to the pre-tragal space, attempting to stay on a broad front and have

as much exposure within my incision as possible and avoid getting into a deep pocket. So opening the pre-tragal space involves serially dissecting the tissues between the oracle and mandible and the parotid itself. This area can be fairly bloody or vascular and requires slow, meticulous dissection to provide hemostasis and ensure that the facial nerve isn't overlooked or transected. Ultimately, through this pre-tragal dissection and with continuous or repeated palpation of the landmarks, including the tragal pointer and the tympanomastoid suture, it's possible to identify the facial nerve trunk just after it's exited from the stylomastoid foramen. So you see in this diagram and in the photograph, the facial nerve trunk with the parotid gland retracted anteriorly. Once the nerve is dissected – I'm sorry – is identified, it can be dissected from proximal to distal and this is important to be done with very careful continuous observation of the nerve and avoidance of thermal injury to the nerve and its branches, while being sure to adequately encompass the tumor that is being resected. So we have here an animation of a new technology, namely the harmonic technology, which can be very useful for this bloodless coagulation and tissue dissection. If we could have the video, please?

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[ON VIDEO] NARRATOR: In the Harmonic system, an ultrasonic wave operating at a frequency of 55,500 cycles per second, causes the active blade to vibrate, creating excursion of the blade tip from 50 microns at power level one to 100 microns at level 5. The transducer, housed in the Harmonic hand piece, converts electrical energy to mechanical energy. It consists of a stack of piezoelectric ceramics sandwiched under high pressure between two metal cylinders. When pulsed with a high-voltage electrical signal from the generator, at the resonant Harmonic frequency of the ultrasound acoustic system of 55,500 hertz, the transducer, blade extender, and blade expand and contract with each wavelength, along the entire length of the device. Longitudinal expansion and contraction increases from just a few microns of longitudinal motion at the transducer to 50 to 100 microns at the blade tip, where maximum motion occurs.

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LISA A. ORLOFF, M.D., F.A.C.S.: So, we actually already have a question from the audience and that is, "How often do you need to do a retrograde dissection of the facial nerve?" In my hands, a retrograde dissection is rarely necessary for identifying the nerve from the outset, but I do find retrograde dissection helpful when individual branches of the nerve may not be easily recognizable, even after the main trunk has been identified. So, really in very peripheral tumors or in tumors that have previously undergone treatment or surgery, it may be easy to start in a location that hasn't undergone surgery and isn't scarred, but for the most part, I still attempt to identify the facial nerve trunk. So with that, I'd like to present a case that I recently managed. This is a case of recurrent pleomorphic adenoma of the parotid in a 19-year-old woman who actually underwent two previous surgeries. Neither of which had recognized that this was a parotid lesion and these surgeries were done based on the presumption of a skin-based or subcutaneous lesion where the tumor had been violated and therefore had ceded the parotid and she presented with recurrent multifocal pleomorphic adenoma of the parotid, as you can see in this MRI scan.

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DAVID J. TERRIS, M.D., F.A.C.S.: Those are always very difficult cases, Lisa.

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LISA A. ORLOFF, M.D., F.A.C.S.: Yeah, I hope that that's illustrative for this purpose of the video that you're about to see, but I think the technique is the same, although maybe a little more tedious. Fortunately for this patient, her facial nerve was intact and I'd like to emphasize that it's important in any patient with a parotid mass who's going to undergo surgery or who's undergoing workup that facial nerve function should be documented before surgery. So, here we're going to see this 19-year-old woman who is undergoing a parotidectomy procedure and you'll see initially the incision where – I do try not to make to acute an angle at the post-auricular portion of the flap, so as to avoid tip necrosis of the flap. Since this patient had undergone previous surgery, we're going to resect a small island of skin where here previous scar was and where the tumor had been in contact. So you see that being performed here. I'm doing this sharply and then I'm proceeding to raise the flap sharply where there is preexisting scar tissue. I attempt to raise the flap in the plane just superficial to this mass, and as I transition to the neck, just deep to the platysma. In male patients, it's relatively easy to identify the hair follicles and ensure that your flap isn't getting too thin. In female patients, that can be a bit more difficult, so I do repeatedly palpate the thickness of the flap to make sure that we don't buttonhole it. You can see palpating here and once we get beyond the plane of scarring, I'll transition to the use of facelift scissors, which I find to be a little bit more expeditious in raising the more anterior portion of the flap out to the level of the masseter muscle. So here you see developing tunnels and snipping between the tunnels with the facelift scissors. Again there are many ways that this can be accomplished and this just provides a broad plane of exposure and with repetitive palpation of where the tumor nodules or nodule exist so that you can be sure to encompass the tumor and accomplish your goal. So here we raise a small posterior flap with electrocautery and then retract the flaps with sutures and again there's that skin island that we're resecting along with the tumor in continuity with it in this particular case. So next we will identify the sternocleidomastoid muscle and the great auricular nerve and I find that this is safely done with monopolar electrocautery efficiently and with good hemostasis. So we're just outlining the anterior border of the SCM muscle and working through this patient's scar tissue, opening on a broad front in the pre-auricular region, just to begin to deepen the plane and as we get deeper still, we'll switch to the Harmonic technology, as well as intermittent use of the bipolar cautery to ensure safety and the lack of thermal injury to the facial nerve.

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DAVID J. TERRIS, M.D., F.A.C.S.: You've pointed out a good principle here which is identifying landmarks and going from one landmark to another to make sure that you utilize your anatomy – your knowledge of the anatomy to identify...

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LISA A. ORLOFF, M.D., F.A.C.S.: I find that it's quite easy to get disoriented after staring at the wound and looking for the facial nerve for a while. So it's good to reconfirm the landmarks and especially if you're standing in a position that's other than looking at the anatomy what you're accustomed to, that it's good to repeatedly palpate those landmarks. So here you see both close up and more distant views of the pre-tragal dissection coming through that area that has many small vascular branches and it seems that the closer you get to the facial nerves, the more blood vessels there can be. But using the Harmonic on the – I use it on the lower power setting of about three for most of my parotid work just to ensure maximum hemostasis. So here we're using the bipolar cautery,

where we're in a little bit tighter space and approaching the facial nerve. There's the facial nerve trunk, which we just stimulated with the probe for the nerve integrity monitor. Now that the facial nerve trunk has been identified, I open up the tissue enough to allow access with a dissecting forcep and here we're dissecting from proximal to distal, over the facial nerve trunk, lifting the parotid tissue up and away from the nerve, and then using the Harmonic FOCUS to divide the tissue while providing hemostasis. You see the active blade of the Harmonic FOCUS is away from the facial nerve. We always keep the insulated blade towards the nerve and try to elevate it as much as possible, away from any direct contact with the nerve. So proceeding from the facial nerve trunk, we proceed out to the bifurcation of the facial nerve, where the branches start to become smaller from that point distally. Then, in this patient again I had to take somewhat of a back-and-forth approach between superior branches and inferior branches, simply because of the multifocality of her lesion. It's often convenient just to start at the top or the bottom and kind of work the other direction in identifying dissecting out the facial nerve branches. So we're tracing out a superior branch here with a Harmonic scalpel to dissect and intermittently with the bipolar forcep as well as the number 12 blade which I find is a useful instrument for cutting as well as for palpating the texture of the tissue. So you can see normal parotid parenchyma being raised and we're getting just beyond the location of the tumor based on our palpation and the preoperative imaging. But again, good hemostasis and I find that good hemostasis up front saves a lot of time in the long run.

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DAVID J. TERRIS, M.D., F.A.C.S.: Another principle that you've alluded to is using different instruments for different parts of the operation. I think you want to use the best instrument for a specific part of the procedure, as opposed to sticking with one instrument for the entire procedure.

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LISA A. ORLOFF, M.D., F.A.C.S.: Yeah, I agree that where useful, if the instruments are available, use the best one for the particular location or the particular anatomy. So you see there on the video that there's a use of the number 12 blade moving away from the facial nerve and then back to the Harmonic when we're beyond that portion of the dissection and really coming around anteriorly adjacent to the masseter muscle, we're able to make a little bit more expeditious progress here in this part of the dissection, but then go back now to the inferior branches of the facial nerve and back to some bipolarizing and scalpel cutting and then back to the Harmonic. So this is the marginal mandibular branch being traced out and we're sort of encircling the tumor from both sides.

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DAVID J. TERRIS, M.D., F.A.C.S.: It's a very avascular dissection. I see very little bleeding during this procedure. It's nice to see.

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LISA A. ORLOFF, M.D., F.A.C.S.: Well, of course the movie's been edited but I do find that with this technique that taking the time to prevent bleeding in the first place really saves time and maximizes safety in the long run. So here we're just about finished with identifying our branches, but yet again we repeatedly confirm their integrity and their identity as we come around the anterior portion of the specimen and eventually we can free up the final attachments to the parotid parenchyma and deliver the specimen intact and with facial nerve preservation.

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DAVID J. TERRIS, M.D., F.A.C.S.: Very nice dissection, Lisa.

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LISA A. ORLOFF, M.D., F.A.C.S.: Thanks. Thanks, Dave. Here you see the final blow and there's the tumor specimen and palpating the tumor to ensure that there are no positive obvious margins grossly and that there are no nodules that have been left behind by palpating the wound bed and then irrigating and confirming hemostasis in the parotid bed here. Finally, stimulating the facial nerve with the nerve probe to confirm the integrity of the branches. Then we just proceed – I tend to use a drain in the vast majority of my parotid procedures.

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DAVID J. TERRIS, M.D., F.A.C.S.: Yes, I do, Lisa. I've gotten away from that in thyroid surgery, but in parotid surgery, I still use a drain routinely.

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LISA A. ORLOFF, M.D., F.A.C.S.: Yeah, I know you're going to show us in your thyroidectomy video and in your discussion that drains aren't automatically necessary in thyroid surgery, but I still find that they're helpful in ruling out a hematoma, providing initial drainage, and alerting to the possibility of a salivary leak or a seroma, but usually they can be removed on post-operative day number one.

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DAVID J. TERRIS, M.D., F.A.C.S.: Right, I think it has to do with cutting across the salivary tissue and I worry about that secreting fluid during the immediate post-operative period.

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LISA A. ORLOFF, M.D., F.A.C.S.: Yeah, so I think that we have another question from the audience here. Let's see. "What is the risk of injury of facial nerve in the total conservative parotidectomy?" Well, I'm not sure that – I think that the audience member is referring to a total parotidectomy where the facial nerve is mobilized, and provided that the facial nerve has been identified as it is in a superficial parotidectomy, and is mobilized in the same cautious technique with avoidance of thermal injury, the risk is probably – and it should be advised to the patient that the risk is going to be higher simply because of complete mobilization and potential devascularization of the nerve. But the permanent paralysis rate should be equal to or very close to that of a superficial parotidectomy unless there's nerve invasion.

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DAVID J. TERRIS, M.D., F.A.C.S.: Yeah, I think the temporary rate of weakness is probably higher but the permanent rate should be similar.

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LISA A. ORLOFF, M.D., F.A.C.S.: Yeah. So I have another couple of questions regarding thyroid surgery, but I think we'll allow Dr. Terris to present his discussion of his experience with minimally invasive thyroid surgery, along with his video, and then we'll field more audience questions.

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DAVID J. TERRIS, M.D., F.A.C.S.: Terrific. Thank you, Lisa. It's always a pleasure talking about my favorite topic, which is thyroid surgery. One of the reasons that it's such a great time to be a thyroid surgeon is so much is happening in the last three to five years.

After doing a thyroidectomy, essentially the way it was described by Theodore Coker for 100 years, in the last few years, things are changing rapidly and many of these changes are technologically driven. Whether it's the advent of advanced energy sources, the availability of reliable nerve monitoring techniques, or the availability of high resolution endoscopy, which improves our visualization during surgery. Each of these has contributed to allow us to perform a minimally invasive approach to selected patients. One of the first questions we have to ask ourselves is, "What exactly is minimally invasive thyroid surgery?" It can mean different things to different people. In my mind, in my practice, it involves a small incision, usually about three quarters of an inch, relative to the standard eight to ten centimeter incision. It's sutureless. We don't use stitches or clips. When we're done with the thyroid, the bed is completely clean. We don't use stitches on the skin. We just use medical grade glue, like Dermabond. No drain is necessary for the vast majority of cases. Again, owing partly to the improved hemostasis during these procedures. Therefore, it's almost always outpatient surgery. Even total thyroidectomy patients go home immediately following surgery. It can be done relatively easily under local anesthesia. Again, for some people, that's an important element. For different patients, various of these principles may be of greater or lesser importance. For who does this matter? To start with, I think individuals who are youthful and potentially appearance-conscious, and that's a large proportion of our thyroid population. They tend to be young females that have thyroid diseases. So for those individuals, it might be important to consider minimally invasive surgery. Also the working population. People who need to get quickly back to work. Because of the reduced dissection involved in these approaches, the healing is more rapid following the surgery. Then the elderly population. Again, because of the reduced dissection, I think it's easier for them to bounce back following these procedures. Lower chance of nerve injury, which can have a more profound impact on this patient population. So what about the indications for the surgery? Well first, we see a very large number of solitary thyroid nodules that may not have a diagnosis as to whether it's malignant or not, even with an FNA. So those are perfect patients for an endoscopic removal of half of their gland. No bigger than about 30 to 35 millimeters in greatest dimension. Low risk papillary cancer. I'm going to describe a technique that was first introduced by [Palo Micholi in Pisa] and in fact in their practice now, which is a very high-volume practice, the majority of their patients are having an endoscopic approach for low-risk papillary cancer. Some small multinodular goiters can be eligible and certainly it can't be a very large gland. So overall volume of no more than about 20 cc's. Contraindications? Well, the most absolute contraindication would be an invasive cancer, so if the tumor is involving the adjacent structures or even the overlying strap muscles, that would be a contraindication. Relative contraindications? If somebody has a previous head and neck malignancy and had full-course radiation, that may be a relative contraindication. If the patient's had prior neck surgery, that may make it difficult to do an endoscopic approach. The presence of thyroiditis, especially Hashimoto's thyroiditis, can make even open surgery more challenging and it can make endoscopic surgery very, very difficult. And a patient with a thick neck, because it increases the depth of dissection, so we have to go further down in to get to the thyroid gland. That can make it more challenging. What about the equipment? Well, a high resolution endoscope is mandatory. These are available in every hospital in the country now. I prefer the Harmonic ACE product for doing minimal access surgery, as we'll demonstrate. And

Medtronic makes a very nice thyroidectomy set. Nerve monitoring I'd say is not mandatory and certainly not standard of care, but I think it makes a natural marriage with minimally invasive surgery because of the necessarily reduced aperture through which we do our surgery, so I think it's helpful in these cases. I mentioned the Medtronic set. It's one of the few instruments that specifically designed for thyroid surgery and has a number of features that I think make it very helpful. For example, the retractors are specially designed to have a wider angle than an Army-Navy, for example. They're deeper than an Army-Navy retractor, which allows us to get down to the thyroid gland readily. It's flared on one end, which is designed to allow us to capture the thyroid gland and mobilize it with the retractor itself, and it has a matte finish, which minimizes the chances of reflection and glare from the instrument if you're using a headlight, which is what I like to do for the open parts of this procedure. The blunt elevators are very helpful for establishing atraumatic dissection around the gland. This is a nerve-friendly suction, specifically designed to reduce the trauma around the recurrent laryngeal nerve or the parathyroid glands. The suction ports are around the edges. It's a malleable suction device. It is very helpful to reduce trauma around the nerve and parathyroid glands. This is a peanut holder, I think the only one of its type, where you have an instrument specifically designed to hold a peanut, which is a little cottonoid that we use for dissection sometimes during thyroid surgery. So the steps of this procedure, it really starts open, then goes endoscopic, then back to open. So it's a three-part surgery. The first part of the procedure starts with a skin incision of about three quarters of an inch and we vertically separate the strap muscles and I'll mention here that we don't raise subplatysmal flaps, which is the way most of us were trained. It turns out to be unnecessary even for open surgery. In fact, I haven't raised subplatysmal flaps in my last 4 or 500 thyroidectomies. We then go on to identify the plane between the strap muscles and the thyroid gland and accomplish a very liberal blunt dissection laterally around the glands and then the retraction is quite important and we want to place the retractors directly on the thyroid gland itself and on the strap muscles opposite the thyroid. This is what the positioning looks like during surgery. It's a three-person surgery. I like to rotate the bed 180 degrees from the anesthesiologist and I'll try to point out some of the differences between my technique and the [Micholi] technique. You can see here that it gets a little crowded around the head of the bed because we have the endoscopic tower, the Harmonic device, the nerve monitor, so rotating 180 degrees can be helpful. I don't extend the neck very much on these patients. We've gotten away from using shoulder rolls and thyroid pillows because it's really not necessary during the surgery. So, we go endoscopic and we use a five-millimeter, 30 degree laparoscope angled upward to approach the superior pole at the start of the procedure. We ligate those vessels, then we address our attention to the middle thyroid vein, ligate that vessel, and then we rotate the camera downward to identify the recurrent laryngeal nerve and trace it out. Typically we will identify the inferior parathyroid gland at this juncture. The superior gland often not identified until after the delivery of the gland. So at this point, we've mobilized the gland and identified the important structures so we can extract the gland by placing a series of clamps on the superior pole. We use that as the handle to deliver the gland. We divide the isthmus either just before or just after this step and then we find the nerve again and trace it all the way until it enters the larynx, thereby completing the lobectomy and then we do the same thing on the opposite side if we're doing a total thyroidectomy. So, if we can roll

the video, this is a 49-year-old wife of a physician from Charleston, who has a history of radiation, and a thyroid nodule. A needle biopsy suggested a Hurthle cell neoplasm. Because of the history of radiation, we're going to do a total thyroidectomy. You can see here that we've marked out the thyroid. We can make our incision quite low by virtue of having the endoscopes to reach the upper pole of the thyroid. We start by making a horizontal incision and then we identify the strap muscles and separate these in the midline. Again I'll emphasize that no subplatysmal flaps are elevated and in fact we work in a plane deep to that platysma muscle. So we're going to do that separation of the strap muscles all the way to the top of the thyroid cartilage, as one can see here. Then we work inferiorly. So we're going to dissect the strap muscles all the way down to the clavicles. Once the strap muscles are fully separated, we can begin to get into the plane between the thyroid gland and the strap muscle. So, at this point we're going to be looking for the middle thyroid vein and this is not always identified during a thyroidectomy, but in this case she has a well-defined middle thyroid vein. Typically branches right as it approaches the gland. We're going to dissect on either side of that vessel and isolate it. So this is a point where we're going to bring in the Harmonic device to ligate that vessel.

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LISA A. ORLOFF, M.D., F.A.C.S.: So Dave, you're still in the open portion at this point, right?

00:34:44

DAVID J. TERRIS, M.D., F.A.C.S.: Right, so we're showing this on the video, but really we're working open and the scope is used simply to capture the procedure. Once we approach the superior pole, we will switch to an endoscopic method. So, we ligate that vein as you can see here. Again, by virtue of the Harmonic, we can avoid the use of clips or sutures. So now the lateral surface of the gland is fully mobilized. We're going to work our way superiorly to mobilize the superior pole. This is the only muscle that's divided during this operation which is a small portion of the sternothyroid muscle, right as it attaches to the larynx. Once we divide that, it really opens up that superior pole. The next step here is to dissect medial to the superior pole of the thyroid and we get in the space that is sometimes called "The Triangle of [Berti]", named for [Palo Micholi's] assistant [Piero Berti]. In this space, we want to be mindful of the external branch of the superior laryngeal nerve, which we make an effort to identify, but it's not mandatory. Now you can see we've identified the superior extent of the thyroid gland and we have the vascular pedicle isolated. Now in the old days we would individually ligate these vessels. Now we just take that entire pedicle in a single bundle and that really makes this an expeditious part of this case and allows us to move along quickly and you're further away from the external branch of the superior laryngeal nerve, so I think in fact it's a safer technique. So now the superior pole has been mobilized and we're going to address our attention inferiorly to identify the recurrent laryngeal nerve. Again I'll point out that we dissect perpendicular to the direction of the nerve, which is different than the way most of us were trained. We were trained to get a clamp and dissect parallel to the nerve. It's actually easier to find it dissecting perpendicular with this blunt gentle technique, using elevators. Here you can see the nerve. It's an early branching nerve, which we occasionally see, about 30 or 40 percent of the time. You can see that there's a branch of the inferior thyroid artery crossing directly over the top of it, which is the typical relationship between the nerve and the vein. I'm sorry, between the nerve and the artery. So, we're

going to ligate that artery now that we have the nerve in direct vision. This can be done safely with the Harmonic device. So once that's accomplished – again, you can see the nerve deep to where we're working. We want to trace that superiorly a little bit so that we can address the superior pole. Now we're taking the inferior pole and you can see the nerve deep to where we're working and with that under direct view, we can safely take the entire inferior pole and mobilize that. Once that mobilization is complete, then we can exteriorize the glands. Here we've placed a couple of clamps on the superior pole and we then deliver that gland out through the incision. So now the final step is to trace that nerve all the way until it enters the larynx. To be certain that we can avoid injury to that structure. This is a point in the procedure where the nerve is most likely to be injured, so it's important to maintain it under direct view at all times. This is the superior parathyroid gland and this is the typical relationship of that gland to the nerve as the nerve starts to turn into toward the larynx, we will see the superior parathyroid gland, so we want to preserve that with its blood supply intact as you can see. Once we're away from the nerve, we can switch back to electrocautery to complete our dissection here, taking special care to make sure we remove all of the thyroid tissue. I prefer to do a total thyroidectomy as opposed to a subtotal. Lisa, I'm not sure what your thoughts are on that.

00:38:24

LISA A. ORLOFF, M.D., F.A.C.S.: No, I agree Dave. Removing as much thyroid tissue as possible safely and with this technique that can be done safely.

00:38:33

DAVID J. TERRIS, M.D., F.A.C.S.: Yeah, I think historically it was common to deliberately leave a little bit of thyroid. I think it's better to remove the whole thing. This is dividing the isthmus. In this case, using the Harmonic device. It can be done with electrocautery, depending on personal preference. So we want to inspect the specimen to make sure, first of all, the tumor's been completely removed, as you can see here, and that there are no parathyroid glands that have inadvertently removed. So now we're going to address the contralateral side, so we're going to retract the muscles and again dissecting that plane should be a very easy dissection plane between the thyroid gland and the strap muscles, and mobilize the thyroid. Here we're working somewhat inferiorly, which makes it easier to identify the recurrent laryngeal nerve later in the case. So again we've addressed our attention more superiorly and completing our dissection laterally around the gland. She did not have a well-defined middle thyroid vein on this side. Then we get in the space again between the larynx and the superior pole of the thyroid, that avascular plane, and you can see the sternothyroid muscle is overhanging just slightly, so again we're going to divide just a little bit of that muscle right as it inserts in the larynx to provide greater access to that region. The Harmonic is a good device for accomplishing this.

00:39:55

LISA A. ORLOFF, M.D., F.A.C.S.: So Dave, we're getting lots of questions from the audience and we appreciate that and one of the questions is, "Doesn't the Harmonic produce heat and damage the finer branches of the nerve?"

00:40:03

DAVID J. TERRIS, M.D., F.A.C.S.: And that's an important question. It does produce heat and that heat needs to be managed during the surgery. The heat is actually lower than that produced by electrocautery, for example, which operates at temperatures of

about 3 to 400 degrees Celsius. But it does get up to about 90 to 100 degrees Celsius and so if there's any question or any doubt about the nerve or branches of the nerve, one should create space between the tissue that you're going to ligate and the nerve. But that certainly is an important consideration.

00:40:30

LISA A. ORLOFF, M.D., F.A.C.S.: Yeah, I think that's true in parotidectomy as in thyroidectomy.

00:40:34

DAVID J. TERRIS, M.D., F.A.C.S.: So now we've completed the devascularization of the superior pole here and again we're going to direct our attention inferiorly and with the retractor directly on the thyroid gland itself, we're going to identify the recurrent laryngeal nerve. Again, dissecting perpendicular to the direction of the nerve. When the head is not hyperextended, you'll find that the nerve is kind of wormy in appearance as opposed to being stretched taut as would be the case if we've got neck hyperextension. So here we see again the nerve coming into view and this is where we like to spend a little time during the surgery – I like to tell my residents the key to efficient but safe surgery is knowing when to go slow and when to go fast during an operation. So this is where we want to slow down a little bit and make sure we carefully and gently dissect out the recurrent laryngeal nerve and you will begin to appreciate that on this side as well there is an early branching recurrent laryngeal nerve and it's quite important to recognize that when it occurs because you don't want to follow one branch thinking that it's the trunk of the nerve when in fact you're going to potentially injure the other branch.

00:41:40

LISA A. ORLOFF, M.D., F.A.C.S.: That's a very good point and again you demonstrate nicely the perpendicular dissection away from the nerve, just the opposite of how we do it in facial nerve dissection.

00:41:51

DAVID J. TERRIS, M.D., F.A.C.S.: Yes, Lisa, and it's not intuitive, and it was kind of tricky for me to learn that at first but it turns out to be much easier to identify the nerve using that technique. We're going to dissect the nerve inferiorly enough so that we can safely and expeditiously complete our mobilization of the inferior pole. I'll just point out, I like the ACE product that comes with a pistol grip. This is the 23E product. It's very ergonomic at the handle. It's a little bit long for a thyroidectomy, but you need the slender profile of the shaft in order to get into these small spaces. Once again, we're going to deliver the glands. It's attached to the trachea by the ligament of Berry and so simply what we need to do now is get back on that nerve and trace it out until it enters the larynx, dividing the tissue over top of it, again using the Harmonic. This is another good point in the procedure to use this device because we really want this to be bloodless if at all possible since we're working around the nerve. Again, careful inspection and identification and tracing of the nerve to be absolutely certain that it's not injured as we round the corner here on the ligament of Berry and deliver the glands.

00:43:08

LISA A. ORLOFF, M.D., F.A.C.S.: So there's another question from the audience. “Do you ever have trouble burning the skin with the Harmonic device?”

00:43:14

DAVID J. TERRIS, M.D., F.A.C.S.: Well, you want to be very careful not to rest the tip of the device or even the shaft on this device can get hot enough to burn the skin and the temptation, I think, the instinct is to fulcrum the shaft against the skin edge and you certainly don't want to do that because it can burn the skin edge, so you have to be very careful with it, as with any hot device that may be utilized during surgery.

00:43:34

LISA A. ORLOFF, M.D., F.A.C.S.: Right. There you have a nice second thyroid lobe.

00:43:39

DAVID J. TERRIS, M.D., F.A.C.S.: That's right. So we're just going to demonstrate the thyroid bed. What I like is there's no silk sutures. There's no clips. There's nothing left in the wound. We demonstrate the superior parathyroid gland. You can see the nerve. This is the inferior parathyroid gland. This is the right side embedded in the thyrothymic ligaments. On the right said, again we saw the superior parathyroid gland demonstrated. You see the branching recurrent laryngeal nerve and then possibly the inferior parathyroid gland, not well-identified on this side. Then the closure is actually quite rapid. I like to use a little bit of surgicil in the thyroid bed. In this case we trim just a tiny sliver of the skin edge because it was slightly stretched during the delivery of the gland and this allows this to heal without a hypertrophic scar. So I have a low threshold for just trimming a little bit of skin. We put a single figure of eight 3-0 Vicryl on the strap muscles and then a single 4-0 Vicryl on the subcutaneous tissues, as you saw, and then a little bit of Dermabond for the skin edge and it comes together quite nicely. This closure takes just three to four minutes to accomplish. Then I put a horizontal sterry strip, primarily to facilitate removal of the Dermabond once the patient is sealed up. We have the patient take that off in about two to three weeks following surgery.

00:44:52

LISA A. ORLOFF, M.D., F.A.C.S.: That eliminates the immediate post-operative visit, too, doesn't it?

00:44:55

DAVID J. TERRIS, M.D., F.A.C.S.: That's right. It makes it so that the patient doesn't have to come in at a prescribed time following the surgery, and especially for out of state patients that want to come in, that can be very helpful. So just to emphasize in closing my section of the program, the advantage of this approach, first and foremost I think is the improved visualization that one can achieve with the endoscopes is really vital. Much like laparoscopic belly surgery, endoscopic sinus surgery. The reduced dissection is – it's hard to measure that, but it doesn't make it unimportant for patients that want to get back to work very quickly, for example. I think it's hard to debate the merits of a 15 to 20 millimeter incision for the right patient and so, for example, here are some of my patients who have flown in from around the country to Augusta to have their surgery because having a small incision matters particularly to them. It's not going to matter to everybody, but for some patients it's quite important. Here's another long-term follow-up of a patient, a younger patient, and then a somewhat older patient. And to finish, I'd say “where does this fit into a thyroidectomy practice?” First of all, I think it's particularly easy to do it in a high-volume practice. In such a high-volume practice, approximately a third of patients will be eligible for the approach. I think again it's not for every patient and it's not for every doctor, but for patients who particularly value cosmesis, I think it can be very gratifying. Also in those for whom rapid wound healing is desirable.

00:46:22

LISA A. ORLOFF, M.D., F.A.C.S.: So, thank you Terris, that was terrific. Dr. Terris. We do have lots of questions from the audience so we're delighted at the audience participation. There's a question about what the role of thyroid scan is in the diagnosis of thyroid tumors, so a little bit more on the workup of thyroid tumors. I know for me, I rarely ever obtain thyroid scans in this day in age but I don't know if you find them helpful in the preoperative thyroid assessment.

00:46:48

DAVID J. TERRIS, M.D., F.A.C.S.: Yeah, very uncommonly, unless the TSH, the thyroid stimulating hormone, is suppressed, and that would be an indication for obtaining a scan, primarily to make sure there's not a cold nodule, which would merit a fine needle aspiration, but that would be the rare case where we would obtain a thyroid scan nowadays.

00:47:05

LISA A. ORLOFF, M.D., F.A.C.S.: Yeah, yeah. Another question. "Do you have any experience with the Harmonic Curve blades during parotidectomy? I worry about the lack of an inactive blade to protect the nerve." I would have to say that that may be a misconception. There is one inactive blade and then there's an active blade. During parotidectomy, I always keep the inactive blade that's insulated directed toward the nerve but never directly in contact with the nerve, which was another question from the audience. We do not touch the nerve with the Harmonic. But I find it quite helpful to use the Harmonic Focus during open thyroid surgery for the exact purposes you were describing of ligating the superior pole vessels all in a bundle and not having to dissect those out individually.

00:47:49

DAVID J. TERRIS, M.D., F.A.C.S.: Yes, that's an important principle. The advent of the focus has really improved our ability to do open thyroid surgery. One of the reasons is you can not only ligate and cut with a single instrument, but now you can dissect as well. So I think it's particularly useful for open thyroid surgery. When the incision gets smaller than about six centimeters, I think it's difficult to get that instrument in through the incision, so I prefer the ACE product. But for open surgery it's terrific.

00:48:15

LISA A. ORLOFF, M.D., F.A.C.S.: Yeah, I would agree. Another question regarding parotid surgery, "Do you always have to identify the nerve for superficial smaller tail of parotid tumors?" That's a debatable question, I would say. I typically do find the facial nerve trunk and then only the branches that I think are in close proximity to the nerve from that point beyond. I know that there are reports and surgeons who perform safe parotidectomy or tail of parotid excision without identifying the facial nerve, but I don't feel comfortable without at least identifying the marginal mandibular branch. How about you?

00:48:53

DAVID J. TERRIS, M.D., F.A.C.S.: Well, yeah. I think again we were all trained that the minimal operation for any tumor in or around the parotid gland is a superficial parotidectomy with identification of all the branches of the facial nerve and I think that that dogma has come under challenge and rightfully so. I would typically address a tumor like that the same way you described, Lisa, which is to find the trunk and then only trace

out those branches that relate to the tumor. I think the important principle is if a nerve may be at risk or a nerve branch may be at risk, then we need to identify it and make sure it's injured.

00:49:25

LISA A. ORLOFF, M.D., F.A.C.S.: Yeah, I would agree. Great questions. Keep them coming. There's one going back to thyroid about what voice or swallowing problems do patients report from dividing the sternothyroid muscle, if any?

00:49:36

DAVID J. TERRIS, M.D., F.A.C.S.: Yeah, we don't really see that. In fact, for certain cases we horizontally transect the mid-portion of the sternohyoid and sternothyroid muscle. I've dubbed that the "[Sofferman] Technique" after Bob [Sofferman], who introduced me to that concept. I do that relatively uncommonly nowadays. But even when we were completely horizontally transecting those strap muscles, we found no problems with voice or swallowing, but it's an important question and a good one. But in an endoscopic approach, it's really just a very small portion of that muscle that's divided.

00:50:08

LISA A. ORLOFF, M.D., F.A.C.S.: Okay. I think there's another question relating to thyroid surgery, just regarding identification of the parathyroid glands and comparing traditional thyroid surgery, where subtotal thyroidectomy was performed in part to avoid injury to the potentially difficult to identify parathyroid gland otherwise and how do you enhance identification of the parathyroid gland?

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DAVID J. TERRIS, M.D., F.A.C.S.: Well, it's similar to preservation of the nerve. The obligation is on the part of the surgeon to identify the parathyroid glands to minimize the chances of injury to those structures. So that's -- at the outset, we make an effort to identify all four parathyroid glands. The reality is the inferior glands are often ectopic and can be embedded in a thyrothymic ligament. You may not even see it during a thyroidectomy, or you may have an intrathyroidal parathyroid. So we don't always identify all four, though that's the goal of every thyroid operation. So again I think that's a very important fundamental principle in thyroid surgery.

00:51:09

LISA A. ORLOFF, M.D., F.A.C.S.: Certainly you feel better after you've identified one or two, relating to the subsequent glands, but again I think that the idea of not seeing them is less desirable than seeing them and preserving them and not just assuming they're safe if you don't see them.

00:51:25

DAVID J. TERRIS, M.D., F.A.C.S.: Right, and I think while it makes sense that if you leave part of the thyroid you can maybe minimize trauma to those glands, I think that doesn't justify doing a subtotal thyroidectomy. I think we still want to do a total thyroidectomy.

00:51:38

LISA A. ORLOFF, M.D., F.A.C.S.: Yeah. So, here's a question. "How long does a case like this take?" I'm sure that that's variable depending upon the experience of the surgeon. But in your hands, Dr. Terris, how long does the minimally invasive thyroid take?

00:51:49

DAVID J. TERRIS, M.D., F.A.C.S.: Yeah, there is a learning curve associated with the procedure, and I'll just mention we have a very high-volume practice. I personally do about 250 cases a year. In my practice it's about 45 minutes to an hour to do a lobe and about an hour and a half to an hour and 45 minutes to do a total thyroidectomy endoscopically, which is a little bit longer than open surgery, but I think acceptably longer and most patients are okay with the surgery taking an extra 10 or 15 minutes in order to have that small incision.

00:52:14

LISA A. ORLOFF, M.D., F.A.C.S.: Yeah. Here's a question for parotidectomy. "What is the healing time for parotidectomy and is eating and drinking an issue after the surgery?" For me, I actually do tend to hospitalize most of my patients just over night, discharge them after removing their drain the next morning if there's no evidence of hematoma, and I start my patients eating and drinking once they're awake enough to do so if they have no nausea. I think that the return to activity is typically about a week or so, but I don't know if that's your experience as well.

00:52:49

DAVID J. TERRIS, M.D., F.A.C.S.: Yeah, similar to my practice, Lisa. Even though we send most of our thyroidectomy patients home after surgery, I still keep my patients who have parotid surgery in the hospital overnight, use a drain, usually take it out the next morning, and typically they go home the next day.

00:53:01

LISA A. ORLOFF, M.D., F.A.C.S.: Yeah, and I wanted to ask you, Dave, about your management of calcium in the post-op thyroidectomy patient with this technique.

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DAVID J. TERRIS, M.D., F.A.C.S.: Yeah, that's an important question and an important consideration. What we do is we prophylactically replace patients with calcium on a three-week taper following surgery so that they may become transiently hypoparathyroid, but they don't become hypocalcemic as we prop them up with calcium, and we find that in the vast majority, they don't demonstrate any signs or symptoms of hypocalcemia when we manage it this way. So we don't even get a calcium level following surgery until they're off of their calcium replacement. So about a month after surgery we'll get a calcium level.

00:53:45

LISA A. ORLOFF, M.D., F.A.C.S.: So, what kind of regimen do you use? What dosage of calcium?

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DAVID J. TERRIS, M.D., F.A.C.S.: We give a gram three times a day, the first week, a gram twice a day, the second week, and a gram once a day, the third week. So a hefty dose of calcium.

00:54:00

LISA A. ORLOFF, M.D., F.A.C.S.: Do you ever replace vitamin D, as well, or do you not find that necessary?

00:54:04

DAVID J. TERRIS, M.D., F.A.C.S.: We have lately switched to the OsCal D variety, which has some vitamin D associated with it. It's quite common to have vitamin D deficiency, especially in the southeast. So that's a common finding.

00:54:16

LISA A. ORLOFF, M.D., F.A.C.S.: Good. I think that will save patients from blood draws as well as hospitalizations. So there's a question about ductal lavage in the diagnosis of the thyroid nodule, as discussed by Dr. [Hoda Rhana] from Presbyterian Hospital. Are you familiar with ductal lavage? I am not.

00:54:33

DAVID J. TERRIS, M.D., F.A.C.S.: Ductal lavage? No, that's not something I've heard of. It sounds like a fine needle aspirate and maybe if you're using that on a node, you can send that for a washing for thyroid globulin, may be what they're referring to.

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LISA A. ORLOFF, M.D., F.A.C.S.: Perhaps, yeah.

00:54:47

DAVID J. TERRIS, M.D., F.A.C.S.: Or, more recently it has been described that you can use fine needle aspiration of parathyroid adenomas and send the washings for parathyroid hormone levels, but I'm not sure exactly what that question refers to.

00:54:58

LISA A. ORLOFF, M.D., F.A.C.S.: Yeah, we frequently use chemistry as well as cytology when we're doing ultrasound-guided fine needle aspiration biopsies, as you said, for thyroid proteins such as thyroglobulin or for parathyroid hormone for suspected parathyroid lesions. Perhaps that's the question and that's the answer. Here's another question. "When do you sacrifice the facial nerve in parotidectomy?" I would say that I would not sacrifice the facial nerve unless I were certain that the lesion were malignant, first of all. So even if a fine needle aspiration biopsy indicated a malignancy, I would obtain intraoperative confirmation of that diagnosis before I sacrificed a facial nerve. Even in that case, I would tend to do so only if the facial nerve was not functioning preoperatively and the nerve was really encased with tumor. I think tumor can be peeled off of the facial nerve, knowing that there's going to be some microscopic disease in the case of malignancy where you anticipate using postoperative radiation.

00:55:59

DAVID J. TERRIS, M.D., F.A.C.S.: Yeah, another substantial change in how we approach the patient nowadays compared to 20 or 30 years ago, so I would agree with the bias of preserving the nerve if at all possible, especially if it's working preoperatively and then hoping that radiation can take care of microscopic disease.

00:56:13

LISA A. ORLOFF, M.D., F.A.C.S.: Yeah, yeah. So, another question, "Can a neck dissection be done through the – I guess that refers to a central neck dissection – through the minimally invasive thyroidectomy incision?"

00:56:25

DAVID J. TERRIS, M.D., F.A.C.S.: Yeah, that's a good question. The Italians, again [Palo Micholi] and his group, as well as [Rocobell Antony] in Rome, are starting to do endoscopic neck dissections. In my practice, if they had known or if we discovered intraoperatively lymphadenopathy, we would open our incision and do it with an open technique, still limiting our incision to about three to four centimeters, but not using the telescopes is how I would approach that.

00:56:49

LISA A. ORLOFF, M.D., F.A.C.S.: Yeah, that seems like a reasonable compromise.

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DAVID J. TERRIS, M.D., F.A.C.S.: Now what about ultrasound for parotid diseases. I was intrigued to see your slides.

00:56:56

LISA A. ORLOFF, M.D., F.A.C.S.: Yeah, I had to share those since that is one of my passions is ultrasonography and it's so useful in the office when you're first encountering the patient with a thyroid mass or a parotid mass and really just adds to your knowledge of what the characteristics of that mass are. Although it doesn't diagnose the histopathology of a mass, it does really easily delineate the location of the mass, whether it is indeed within the parotid gland or adjacent to it, what the depth of extension is, certainly helps to guide fine needle aspiration biopsy when you do use it. I think it helps to assess the regional lymph nodes and one very useful aspect of it is being able to examine the contralateral parotid gland to determine if there's intraparotid lymphadenopathy on both sides, for example, in the patient who has a lymph node in the gland, or to assess the submandibular glands as well, to look for the background characteristics of the parenchyma.

00:57:55

DAVID J. TERRIS, M.D., F.A.C.S.: So, one thing I know that you do is you do it yourself, which is again sort of a new frontier for surgeons, which is doing office-based ultrasound and I've started doing it for parathyroid and thyroid diseases and as you've described, it's been a very good experience and I think there's some data to suggest that it may be more efficacious in the hands of the surgeon that's going to be doing the surgery.

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LISA A. ORLOFF, M.D., F.A.C.S.: Yeah, although we are very familiar with the utility of ultrasound in thyroid disease and the salivary gland parenchyma is so similar to thyroid parenchyma and it's very accessible to the ultrasound probe, so I think for our listeners in Europe and in Asia, you may already be using ultrasonography for your workup of parotid and salivary gland lesions, and we're just starting to here in the U.S., but the more we do it, the more we realize its utility. So, I always welcome questions on that. We have one final question. It's sort of a repeat but I think it bears repetition. "How close can you come to the recurrent laryngeal nerve or the facial nerve with the Harmonic scalpel?"

00:59:01

DAVID J. TERRIS, M.D., F.A.C.S.: I'm quite comfortable coming within about one or two millimeters of that nerve, but again, what I would say to anybody that's considering using this technology is do whatever you're most comfortable with and you'll get a sense for how hot the device gets. But I'd say within one or two millimeters quite safely. I obsessively examine my patients postoperatively with flexible laryngoscopy to establish the integrity of the recurrent laryngeal nerve and we've seen no change in the incidence of temporary weakness of the nerve after transitioning to the Harmonic, so I think it really is quite a safe device around important structures like nerves.

00:59:37

LISA A. ORLOFF, M.D., F.A.C.S.: One final question about the parotidectomy defect, "Do you use an interposition graft for cosmesis or to prevent Frey's syndrome?" I think you and I have chatted about this previously, but for me, I do attempt to close this mass to the sternocleidomastoid muscle wherever possible just to eliminate the dead space or the amount of exposed parotid parenchyma as well as to try to minimize that concavity. I

sometimes use a fat graft for interposition, although we know that fat has a tendency to resorb, so the longevity of that is in question. I have used allograft and materials – even things such as GoreTex in the past and have somewhat shied away from that even in benign parotid disease because of the lack of really clear-cut benefit over autogenous tissue and just repositioning of tissue.

01:00:39

DAVID J. TERRIS, M.D., F.A.C.S.: Well, it's interesting how our practices evolve similarly because I have also used a number of different products, but my preferred product now is abdominal fat, the patient's own tissue, and as you pointed out, there will be some resorption of that so we overcorrect, but most patients are quite happy with the notion of taking some fat out of here and putting it up here, so that's something we often do. We use a periumbilical incision so it's essentially scarless.

01:01:01

LISA A. ORLOFF, M.D., F.A.C.S.: Another scarless surgery. Yeah. Well I think we're just about out of time so I'd like to thank our audience for joining us for what I hope was an educational and informative webcast. I'd also like to extend a special thanks to our two patients who agreed to have their surgery videotaped and without whom this program would not have been possible. I'd also like to thank Ethicon Endo-Surgery for sponsoring this series of educational programs for surgeons. I'd like to thank my staff at UCSF for helping me to host this nice event at our institution and I'd like to remind the audience that this has been a presentation on the advances of parotidectomy and minimally invasive thyroidectomy procedures, live from the UCSF Medical Center in San Francisco, California. This webcast can be accessed through the website listed on your screen there. So for those of you who want to see it again or forward it to your friends, please do so. With that, I'd like to thank you for joining us and bid you a good night.

01:01:57

DAVID J. TERRIS, M.D., F.A.C.S.: Good night.

01:01:59

ANNOUNCER: This has been an expert clinical discussion and presentation on technical advances in parotidectomy and minimally invasive thyroidectomy surgeries, live from the University of California – San Francisco Medical Center. OR-Live makes it easy for you to learn more. Just click on the “Request Information” button on your webcast screen and open the door to informed medical care. This program is sponsored by Ethicon Endo-Surgery, Incorporated.

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[end of webcast]