Novel Thyroidectomy Removes Organ Through the Lip

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Editor's Note: A group of surgeons at Mount Sinai Beth Israel, in New York City, are using a novel technique for extracting the thyroid gland through a hidden incision underneath the lip. The transoral endoscopic thyroidectomy by a vestibular approach (TOETVA) is one of the first surgical procedures of its kind in the United States.

Medscape recently interviewed William B. Inabnet, III, MD, the Eugene W. Friedman Professor of Surgery at the Icahn School of Medicine at Mount Sinai and chairman of surgery at Mount Sinai Beth Israel, in New York, to find out more about this approach.

Medscape: Can you describe in detail how the transoral endoscopic thyroidectomy is performed?

Dr Inabnet: Yes. It's a technique that is part of a group of operations called remote access endocrine neck surgery. With these approaches, we make incisions in hidden locations (ie, remote from the neck) so that they cannot be seen by others. There's no visible scar on the neck because the incisions are made elsewhere. With this particular approach, the transoral approach, the incisions are made on the inside of the mouth just underneath the lip, and we tunnel underneath the skin using special instruments and, ultimately, insert a camera and then insufflate the space with carbon dioxide to allow the skin over the neck to expand—so we have a working space. Then we use conventional laparoscopic instruments to perform the operation.
Medscape: Has this type of surgery been performed previously in the United States?

Dr Inabnet: There had been one group that performed this back in the spring, and I'm not aware of any other groups performing this. I believe it was first developed in 2008-2009 by a surgeon in Germany. But with that particular approach, the surgeon went through the floor of the mouth (behind the teeth), and it was wrought with complications—technical difficulties—so that approach has largely been abandoned.

There's a surgeon in China who then developed a sort of subcutaneous—what we call the vestibular—approach. The incision is made in the oral cavity just behind the lip, but he also initially had some difficulties. A surgeon from Thailand named Dr Angkoon Anuwong observed this Chinese surgeon's technique. Then in 2014, after doing several cadaver dissections, [Dr Anuwong] started performing this new technique in humans. He adapted the approach, and that's where I learned the technique. I was at a meeting in Thailand in August of 2015 where he presented his initial series of 60 patients. Since then, he's performed this in over 600 patients. He's had several publications that are in press that I'm privy to, describing his technique and his excellent results.\[1\] Because I didn't really believe this was possible, one of my colleagues from Mount Sinai and I, a team from University of California at San Francisco, and a team from Stanford organized a trip in August to spend a week with this Thai surgeon to observe him. We were all uniformly impressed and really amazed by the technique that he had developed. He made it seem so effortless. Having already been doing these remote access approaches, this is just a natural evolution of the techniques we can offer in our program. We performed our first case in September and have since performed several cases; most recently, just a couple of days ago—this week on Monday. There is no visible scar on the neck because the incisions are made in remote locations.

Medscape: What are the unique characteristics about this particular type of thyroidectomy compared with other procedures?

Dr Inabnet: The conventional approach requires making an incision somewhere on the neck; the incision can be big or it can be small, based on the needed exposure. That's the way thyroid surgery has been performed since the beginning of time, basically. There's nothing wrong with that approach—thyroid surgery itself is very safe and a very common procedure. But with that approach, there is a scar on the neck.

With these remote-access approaches, there is no visible scar on the neck because, as I mentioned earlier, the incisions are made in remote locations. We also have the advantage of having a wonderful magnified view of the anatomy because the camera that we use processes the image into high-definition. The resolution and the lighting are remarkable, and we see some anatomic details that simply are not visible with the naked eye, even with wearing magnifying loops, which surgeons routinely wear during thyroid surgery.

Medscape: Are there any side effects reported in any of the studies, or have you witnessed any complications with this procedure?
**Dr Inabnet:** With the transoral approach, or with any of these approaches, there are some novel complications or potential complications that can be seen that you do not see in conventional cervical approach thyroid surgery. In particular, with the transoral approach, there's a nerve called the "mental nerve" that innervates the lower lip, and if that's damaged, you'll have numbness on your lower lip, which can be quite debilitating. One of the modifications that this Thai surgeon made is the placement of the lateral incision in a location away from the mental nerve.

Members from our team, in fact, went to Taiwan and performed cadaver dissections, and we all shared the images and had knowledge of where these nerves were located and exactly where to place our lateral incisions underneath the lip to avoid that particular nerve. That's been one of the greatest advances that this surgeon contributed—how to avoid injury to the mental nerve. It has been reported, but the incidence is extremely rare; I would say it's less than 1%.

We've had no major complications, and our results are excellent.

**Medscape:** What other remote access approaches or novel hidden-scar endoscopic surgical procedures are currently being performed at Mount Sinai that you're currently involved with?

**Dr Inabnet:** In 1998, my team and I performed the first endoscopic thyroidectomy in the United States, and I believe it was second in the world. We made very small incisions in the neck, and we insufflated the neck. I ultimately perfected that technique and performed that approach in about 50 or so patients by the year 2000. But largely, I was not satisfied and abandoned the approach because I just didn't think it was something that would be largely applicable, and we just were not making advances with the approach.

What happened is a lot of our Asian colleagues (where there's an aversion to having a scar on the neck, more so than in Western cultures) gathered knowledge from the approaches that we developed here in New York and began to develop these remote access approaches. In the United States, this largely just fell to the wayside, but in Asia these techniques started to proliferate and explode. In 2008, I was a visiting professor at the Korean College surgeon's meeting, and my host invited me to spend a day with him and a team in the operating room. I did so, and they had three rooms going where they were doing the transaxillary approach using a robotic platform; one day they did 15 operations, and I was completely blown away.
I came back to the States, started doing some work in cadavers, and in May of 2009 I performed what at the time was the second robotic transaxillary approach in the United States. A group in Texas did one the week before or a few days before we did. We were right there at the forefront of this approach. Since then, I've done many, many of the transaxillary operations, and we've been known for that for quite some time. Last year, I recruited a Korean-American surgeon to join our program named Dr Hyun Suh. In fact, he's cited in the article as a coauthor and has been assisting me with these approaches.[2]

Dr Suh completed his endocrine surgery fellowship at the Massachusetts General Hospital in Boston and an international 6-month robotic thyroid fellowship at the Seoul National University Hospital in South Korea. He then brought another approach back to the United States called the bilateral axillo-breast (BABA) approach. With that approach, there are four very small incisions made: one in each axilla, the armpit, and one along the breast. We don't go into the breast, but we go underneath the skin and the breast tissue so the incision's made around the areola complex—which is where the skin and the nipple are—where the pigmentation changes.

In July of 2015, a little more than a year ago, Dr Suh, assisted by me (he was the primary surgeon), performed the first BABA in the United States, and we've done no press or publicity for that approach. We've since done several dozen BABA approaches; and at present, I am fairly confident that we are the only program in the world that offers the three approaches: the transoral approach, the transaxillary approach, and the BABA approach.

Our surgery is so safe, but we're under tremendous pressure and scrutiny to duplicate and possibly improve upon the already excellent results.

**Medscape:** I understand that the scarring is much less on the patient. Are there any other advantages with these particular types of surgical approaches for the patient? Do they have any effect on when patients are discharged or lessen their risk for complications compared with the other approaches that have been performed in the past?

**Dr Inabnet:** That's an excellent question, and as far as thyroid surgery is concerned, the risk factors are similar to conventional thyroid surgery. When we introduce new techniques, we never want to take a shortcut or end up with results that are not comparable with the conventional approach, so we're under a lot of pressure. Our surgery is so safe, but we're under tremendous pressure and scrutiny to duplicate and possibly improve upon the already excellent results. I think that the main advantage today is cosmetic. However, there are some other advantages that are impossible to prove because it would require thousands and thousands of patients; for example, identifying the anatomy, having the improved lighting, and so forth.

There's very little pain with these approaches, so we err on the side of caution and often keep the patients overnight. Our conventional thyroid patients go home the same day. Because these are new techniques, we want to be safe and make sure that the patient is in no danger. We've had no major complications, and our results are excellent.

There is one other advantage in that there are other operations in the neck that require very large disfiguring incisions. For example, patients with thyroid cancer who have lymph nodes on the side of the neck or lateral part of their neck have to have quite a lengthy incision that can be disfiguring and quite concerning to patients. When you get to that type of incision—and in Asia, they're already performing lymph node access using some of these remote access approaches—I
think that the advantage may tilt in favor of this type of approach where you have incisions in a completely hidden location and avoid a very large disfiguring incision on the neck.

Many of our thyroid cancer patients are quite young—in their thirties and forties and even in their twenties—and so I think that is an advantage. It's also very difficult to study, but those of us who do these types of approaches advocate for that type of advantage.

**Medscape: Where can surgeons and patients learn more about these novel procedures?**

**Dr Inabnet:** As far as how you can learn this approach, I think the most important thing is to be a skilled endoscopic or laparoscopic surgeon, to have a certain skill set that will allow you to know the principles of laparoscopic or endoscopic surgery.

Secondly, it's important, I believe, to observe other surgeons in person. We have lots of visitors to our operating room from around the world who come to observe us operate and learn these techniques, most recently from Switzerland. We have a group coming from Madrid in February; and, in fact, the Thai surgeon I mentioned is coming to join us also in February to check in on us and to help perfect our approach that he taught us. So again, we have this meaningful academic exchange.

Thirdly, if possible, it's important to try to practice these approaches on cadavers, particularly if you have no familiarity with endoscopic neck surgery.

Fourthly, it's important to have a dedicated team that you work with day in and day out, that you can train, that can be a part of introducing these novel techniques.

Finally, we put on a course twice every other year. Our next course is in December of 2017, and it's called the [New York Masters Course in Endocrinology and Endocrine Surgery](https://www.medscape.com/viewarticle/866770). In the past, we have had live surgery, and I anticipate that in the December 2017 course we will have a special session on some of these techniques. We will have live demonstrations from the operating room where the audience can observe and interact with the surgeons in real time.

**Medscape: As far as the clinical pearls or takeaways, do have any that you'd like to share with the other general surgeons about these procedures?**

**Dr Inabnet:** I think the most important thing is to have the necessary skill set to perform these operations and familiarity with thyroid surgery. If you're not a thyroid surgeon, this is not the way to start conducting thyroid surgery. This is for surgeons who already have expertise in thyroid surgery and know their way around the anatomy of the thyroid gland. There are some very detailed nuances that can make the difference between a good outcome and an excellent outcome.

Secondly, I would start very conservatively with small nodules, very thin patients—so very conservative early in patient selection. And then, as one gains experience, you can begin to expand your inclusion criteria to heavier patients, obese patients, different types of pathology, and so forth.

I don't know how widely this group of operations will penetrate, but we remain very optimistic that these procedures do make a dramatic impact on patient outcome and on patient satisfaction. It's important to note also that there are no shortcuts, and we don't violate any of the principles of
thyroid surgery. We adhere to all of the principles of safe, sound thyroid surgery; and we think there's hopefully going to be an expansion for these programs in the years to come.

William B. Inabnet, III, MD, has disclosed no relevant financial relationships.

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References


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