OPEN CONVENTIONAL THYROIDECTOMY
UNIVERSITY HOSPITAL OF LIEGE
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00:00:14
NARRATOR: This program is made possible through an educational grant from Ethicon Endo-Surgery. During the next hour in this live international webcast from Liege, Belgium, Doctors Thierry Defechereux , from the University Hospital of Liege, and Eren Berber, from the Cleveland Clinic in the United States, will demonstrate an open conventional thyroidectomy, using only an ultrasonic device to dissect, coagulate and transect tissue and blood vessels.
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THIERRY DEFECHEREUX, MD: Here in Central Europe we have a huge iodine deficiency, so we face a huge number of [cauteries?]. That's why in this department we have quite a huge experience with dealing with thyroid surgery.
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NARRATOR: During the program viewers may ask the physicians questions by clicking the MDirect Access button on your computer screen. This live webcast originates from the University Hospital of Liege in Belgium, where surgeons perform approximately one thousand thyroidectomies a year to treat patients for goiters. The expertise in treating thyroid disease at the hospital makes it a key referral center in Europe.
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THIERRY DEFECHEREUX, MD: Now, first of all, I have to welcome this worldwide audience for this webcast run from Liege University Hospital in Belgium. The topic of this webcast will be basically the conventional open approach for thyroidectomy in the modern area where new technology are more and more available.
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And one of the main topics will be the use of ultrasonic dissector Harmonic device. So you may ask yourself why coming in Belgium for this webcast. So I have to explain you that one of the major reason is that we are facing here in Belgium, as in other parts of the world like Asia, Turkey or North of France or some part of Italy, a well known severe iodine deficiency. And in this context we have to treat quite an important number of patients with important benign goiter.
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So in this context, we always have been interested in our department in approaching, discovering and investing new device that might improve the quality of surgery in terms of surgical comfort in term of security, safety and also in terms of using the time of anesthesia in surgery that might be an important point for recovery of the patient.
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So, six or seven years ago, we have started using this ultrasonic energy to do a thyroidectomy. And we have actually built quite an important experience with the Harmonic device. All the centers in the world, of course, are sharing the same experience with the device.
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And in this context, I'm very happy to welcome today especially for this event, Doctor Eren Berber from the Cleveland Clinic, who is also using the device. He will be very helpful to help me command the nice video we have been recording a few days ago. And I'm sure you will appreciate this video, which is a live video. And you will see there is no modification in the picture. It's a very high quality video. And we would also share together our opinion about study we have been running about the device. Eren, you have probably some comment to add to this introduction.
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EREN BERBER, MD: Thierry, first of all, I would like to thank you for inviting me to this important event. Endocrine of this order, especially goiter is still very prevalent in most places in the…in the world and thyroid surgery has a very important place in the history of surgery. Actually, most of the famous institutions from today made their fame through thyroid surgery. Nevertheless, since the introduction and establishment of the…the techniques for a safe and efficient thyroidectomy by 1920's, there has been no significant change in our surgical technique until recently.
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And recently, with the introduction of new technology for sealing thyroid vessels, there has been a significant refinement of the technique for thyroidectomy. And our aim today is gonna be together discuss and describe the state of the art technique for performing thyroidectomy from two big centers with big experience on thyroidectomies across the globe.
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THIERRY DEFECHEREUX, MD: Now, thank you very much, Eren. So, we will be very happy as well to reply to your question. As you know in this webcast you have the opportunity to send questions to us by clicking on this button on your screen to MDirect Access. We will receive the question here in Belgium and we'll try to reply as best as we can to your question.
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EREN BERBER, MD: Yes.
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THIERRY DEFECHEREUX, MD: So, basically, to start the introduction of hemostasis and coagulation with the…which is the topic of this webcast, I have to show you this slide. And from left to right you will see the evolution of coagulation from the very beginning where it…what we can call the surgeon, or doctor, will use to…to use this very hot iron, warmed to red to coagulate the wound when applying this on the…on the wound.
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Then, in the eighteen…Well, an engineer from France invented the first electric battery. He was using a battery diving in water with a foot pedal. And as you know, the patient was lying on the table at the…at the top and…doctors were using the cautery, but as you can understand easily it was very difficult to…to define the depth of the burning tissue and to modulate the quantity of electricity going through the patient.
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So I'm pretty sure that most of you know the Bovie that you can see on the right side of the screen. And the beginning of the nineteen…well, the…the battery was not any more used and they were using at that time TSF lamp, which was very helpful in modulating the quantity of electricity to the patient.
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So, later on and still, actually, most of the conventional open surgeries using full coagulation monopolar electricity, which is a high frequency coagulation. So the coagulation of vessels and tissue bleeding are obtained in this context at very high temperature running from 150 Celsius degree to 400 degree. So you can imagine that at this high temperature the tissue are desiccated and oxidized, forming what we can call an eschar to…to stop sealing from the bleeding part of the…the tissue we are operating on.

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So now, of course, you will immediately understand that bleeding can occur when the eschar is going away. And, of course, if we are working in a small space like thyroid space bed, you will have some indirect burning tissue around the place you are trying to coagulate. So skin or internal burning in vital tissue can occur. Why? An [unintelligible] can be secure, of course, by direct burning if you're going to close to vital structure, by faulty installation of instrument, by indirect contact – if you're using some clips, which is quite common in thyroid surgery. But also with [unintelligible].
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I'm pretty sure as well that there are many ENT surgeons in the audience and…and most of them are using the bipolar cautery that can reduce the risk of the monopolar surgery. But basically it's still working at quite high temperature, as you will see in some study. So the morbidity in this very small space where the thyroid is located in the neck, is dealing with relation to the recurrent nerve and parathyroid gland.
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So how can you deal with the hemostasis of all the numerous vessels going to the thyroid? You can do completely conventional hemostasis using tie, using clips and scissor. You can also use those very useful small clips. Well, can be automatic clips, which can be quite expensive. And those of you who are treating Graves' disease know that you can use two or three device for one thyroid surgery, which can be quite expensive.
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EREN BERBER, MD: And---

THIERRY DEFECHEREUX, MD: Also you can ..Yeah, Eren?
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EREN BERBER, MD: And Thierry, I want to totally agree with you. And I think using the staples is going to be too close for the operation. And the clips, most of the time, can fall, you know---

THIERRY DEFECHEREUX, MD: Of course. Exactly. Yeah.
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EREN BERBER, MD: ---if you are putting a lot of clips in these small vessels. And although…I don't know if you're gonna talk about the bipolar energy as being used by---

THIERRY DEFECHEREUX, MD: Yeah, you can have a comment on bipolar.
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EREN BERBER, MD: ---by a lot of ENT doctors. There's a problem of applying the correct angle to the vessels. Imagine you are dealing with a really high upper pole and how are you gonna use the bipolar energy for that. I totally agree with you.
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THIERRY DEFECHEREUX, MD: Yeah. Also, thank you for your comment, Eren. So, dealing with the price of this automatic clip, the solution could be a reloading clip. But, of course, you will understand it takes time and you will need someone to reload the clip. Basically, it could be a nurse and you have to pay the nurse, and it can be a problem, actually.
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So, in this context, and also in the area of the beginning of laparoscopic surgery, company has to create and innovate new device for coagulation, for surgery, for dissection and cutting tissue and vessels. And you probably know those slides explaining how the ultrasonic energy came in this 1994 years. So, basically, one of the main advantage of the ultrasonic energy is to work efficiently at lower temperature. We were talking about 150 to 400 Celsius degree and, actually, we are speaking about 50 to 80, maximum 100 Celsius degree, which is a great difference when you are approaching vital structure.
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EREN BERBER, MD: And, Thierry, actually, I want to make a comment about, you know, how…you know, why did we, you know, at a certain point come up with another dissecting tool. Actually, I have a special interest in the time analysis for different type of procedure. Although, I didn't do it for thyroid surgery, we did some studies for laparoscopic cholosystectomy and laparoscopic adrenalectomy by dividing the procedures into specific steps and looking at the time spent for each step.
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And, we came up with the conclusion that the dissection and controlling the vasculature was the most time consuming part of the procedure. So at that time, there was definitely a need for a better dissecting and coagulation tool. And I think at that time it was timely that we started having…seeing some new technology about this.
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THIERRY DEFECHEREUX, MD: So, Eren, you immediately came up with an important advantage is the time for surgery. We were talking about a difference in temperature but, of course, time will…came up in most of our study – yours and our study.

EREN BERBER, MD: Yes.
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THIERRY DEFECHEREUX, MD: So back to the…the basic of ultrasonic very briefly, just to remind you that it's not electricity that's going through the patient with this device, but the electricity is transformed with [unintelligible] electric device in the mechanical energy. What you can…You all know that in the device there is an active blade at the tip of the instrument which is vibrating at a very high speed, which is 5,500 vibration per second, which is very high.
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And, of course, we have to mention that using this, you will also have a little bit of temperature due to the mechanical mobilization of the tip of the instrument. But if you look at the curve of the lateral spread comparing conventional monopolar, or bipolar even, cautery compared to ultrasonic device, you will see there is a huge difference and huge gap between the two curve, which is in the advantage of the Harmonic scalpel as well.
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No electricity is passing through the patient, which can be also an interesting advantage. And maybe this was one of the goal of most of the study. At the beginning economic advantage came up. So you'll see on the…on the corner of the slide one of the…the basic principle of the use of Harmonic energy to the tissue. Of course, it will cut and coagulate, but also you will have to pass through the process of cavitation and [unintelligible]. That will not only confirm that you are safe with coagulation, but can also help your dissection in different part of the surgery.
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So basically, to resume, oh, you can get a very safe hemostasis with the Harmonic scalpel; it's not desiccation and oxidizing of the tissue. The process is completely different, as you know. It's a process dealing with the protein hydrogen bonds breaking. That will disorganize the protein and will seal the vessels on a completely different action than the very high temperature from monopolar or bipolar.
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So, this was the very beginning of the use of the Harmonic and ultrasonic energy for surgery. As you see, this is the very first generation of the generator used for laparoscopic and open surgery. In the very beginning it was only available, the hook as you can see, and the blade. But, actually, as Eren will explain to you, there are quite a lot of new devices available on the market.
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EREN BERBER, MD: Thanks a lot for this excellent introduction, Thierry. As you can see, the thyroid surgery was especially a good operation to use the Harmonic scalpel because of

the need to divide multiple vessels to do your thyroid surgery. And as you can see, as we started using this equipment in 1998, and you can see the historical development of the equipment for this purpose. And initially, the device consisted of a ten millimeter shaft device with two tips that were used for thyroid surgery. But this was a little bit cumbersome as you had a small space for thyroid surgery and subsequently the devices came up with a shorter and smaller shafts.
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And then there was a problem with applying the device at ninety degree angles to…to the…the vessels. And, because of this, the engineers came up with new designs totally thought of for thyroid surgery. And at the bottom you can see the third generation Harmonic scalpel, which has a five millimeter shaft that's short and also has curved tips, which makes it very appropriate to use in thyroid surgery.
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And if you look at the tips of these devices in more detail you can see, as Thierry talked about, the lower...the tip consists of a vibrating part with a movable upper jaw that you can use to compress the tissue against the lower blade to achieve hemostasis as well as division. And you can see that the third generation Harmonic scalpels came up with these curved blades, which were made very practical to use in thyroid surgery.
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And you can see actual details of the…again, the third generation equipment that also included control buttons at your fingertips so you didn't have to switch back between your feet and the shaft of the equipment.

Now I'm gonna have Doc…And, Thierry, talk about some data regarding the use of the Harmonic scalpel in thyroid surgery.
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THIERRY DEFECHEREUX, MD: Thank you, Eren. It's amazing to look back, oh, at the very first hand piece---

EREN BERBER, MD: Amazing on how it's changed.

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THIERRY DEFECHEREUX, MD: How it changed. Actually, and it will change again. You might probably know that the…that several company are trying to improving so much the…the design of the hand piece, which were at the very beginning not built and not designed for open surgery, but for laparoscopic surgery. And, actually, we are just about to have at our disposal something that's very, very much adapted to neck surgery and we will soon appreciate that.
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EREN BERBER, MD: I'm sure that we're gonna see much better designs for later years.
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THIERRY DEFECHEREUX, MD: Yeah. We'll appreciate them, I'm sure. So, basically, we are both here to present some of the data because we have been among the very first in running study about the use of Harmonic scalpel. And this study was published in the beginning of 2000. At the very beginning of our experience, you can see at that time we were using this reusable hook. It was not completely adapted, but we tried to run a perspective randomized study; one of the first available in the worldwide literature.
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It was a small number of patients, thirty-four patients. We compared two groups – one where we try to use at a maximum the ultrasonic dissector, and the other was conventional surgery as we were using before – clips, tie and conventional instrument.
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Of course, the two groups, we were dealing with a perspective randomized study. We are okay for the study and one of the first goal of the study was, of course, to evaluate the safety and the [effect?] on the endocrine surgery. Would it be interesting to use it or not? This was our first goal. Then, of course, we wanted to differentiate a different aspect of the instrument and to see whether it could be interesting in terms of cost benefit for the doctors, the patient and also for the hospital as it is actually more and more a big concern.
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So, those are briefly the data from the study. As you can see, total thyroidectomy was performed in a time which was quite different when comparing conventional surgery and the Harmonic scalpel. And the time was quite different. It was different…significant difference. It was around one hour with the Harmonic and ninety-six minutes with the conventional surgery.
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We also tried in the study to merger the blood loss, and you can imagine it's quite difficult to measure entire surgery which is supposed to be a very clean surgery. So what we tried to do is to weigh the goals as we were using. We weighted the goals before and after, which was quite boring for the nurse, you can admit, in the operating room.
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So the difference was also immediately quite significant for that. We had a very clean field for surgery. We did Harmonic. Of course, we tried to compare the price of the clips, the number of clips we were using, the price of the surgery and then the complication, of course, during surgery. And there were no major difference for that, which was good.
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Post operative data was real interesting to compare. And there were no major differences, except in some special data, just like the consumption of an analgesic, which maybe could come from the dissection, which were more soft with the Harmonic than with conventional surgery. And also we were surprised to see that the transient hyperparathyroidism was reduced. And, actually, I must say that I can understand why. It's so easy to dissect an ectopic parathyroid gland with the Harmonic.
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If we were using conventional way to dissect, you will use several clips to push the parathyroid and to preserve it away. With the Harmonic it can very fast and very safe. I think a good study will be to measure the number of [also?] transplantation, and I'm pretty sure it will be reducing with the use of Harmonic. It could be an interesting thing to measure.
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So, what can we conclude at the end of this very first study? It seems that we are reducing the blood loss. It seems that we can reduce the parathyroid injury, which can be very interesting. What is completely clear from this very initial study is that we are reducing the operative time and it will remain a very important advantage of the device until now. And it seems that maybe the surgery was less aggressive, as people are consuming less analgesic drugs.
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So, Eren has…has been running a very good study with his colleague, Allan Siperstein, and he will present you the data about this study.
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EREN BERBER, MD: Yeah. Actually, while we were doing that study across from the ocean, we were also looking at our results with this device. And what we did was we looked at the last eighty patients undergoing thyroid lobectomy or total thyroidectomy and compared them with the first eighty patients undergoing the similar procedures with the use of the Harmonic scalpel.
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And, again, this slide shows us the demographics and pathology across the groups. And we had even numbered patients between the lobectomy and total thyroidectomy groups regarding the use of conventional clamp and tie technique versus the ultrasonic dissector. The patients had a similar age, a similar gender ratio and also the…the difference between the right versus left sided lesions was not different.
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And interesting, we divided the…the pathology into a focal pathology, i.e., a thyroid nodule where if it's pathology like Graves' Disease or thyroiditis, and the groups were similar, except that there were more diffuse pathologies in the lobectomy group undergoing procedure with the ultrasonic dissector. Actually, which made it more difficult for the ultrasonic dissector group.
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THIERRY DEFECHEREUX, MD: So, Eren, this was not a prospective randomized study, if I can understand that?
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EREN BERBER, MD: No, this was not a prospective randomized study and, again, the groups were divided based on the availability of the technology. And it just…When it became available, we started using it and so there was no bias in selecting the patients, but it was not a prospective randomized study.
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And this slide actually is the [summer?] slide looking at the operative time spent for lobectomy and total thyroidectomy procedures, by comparing clamp and tie technique versus the Harmonic scalpel. And this scatter plot, the bottom line is that for lobectomy we achieved a reduction of twenty-six minutes from the operative time with the use of the Harmonic scalpel. And this reduction was twenty-nine minutes for the total thyroidectomy procedure.
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So, roughly the number is about thirty minutes that we show that we could save by using the Harmonic scalpel. And this scatter plot, again, shows the relationship between the operative time and the thyroid…and the size of the thyroid specimen. And you can see that the black dots are the conventional group with the clamp and tie technique. And the hollow circles are Harmonic scalpel. And you can see that for a similar thyroid size, the operative time was shorter with the Harmonic scalpel.
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So as Thierry showed you in his study, this study showed us that…I should first of all mention that we did not find any difference in the complications between the two groups. And all of the patients were discharged home within twenty-three hours. And no one was taken back to operating for bleeding. And this showed that the use of the Harmonic scalpel for thyroidectomy procedures was safe and efficient, and that it shortened the operative time by almost thirty minutes compared with the conventional technique. And this means a significant cost savings. And also decreased anesthesia time with possible better and faster recovery of the patients postoperatively.
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After reviewing the physics, basics and also the data related to the use of the Harmonic scalpel---

THIERRY DEFECHEREUX, MD: If I can add something.

EREN BERBER, MD: Sure.
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THIERRY DEFECHEREUX, MD: And it's amazing though, if you go through those very initial and first study that we ran five or six years ago from now, the main conclusion was immediately that you dramatically decreased the time of surgery and it was the…the best

conclusion for all those initial study. It's amazing that you can decrease a lobectomy by twenty-six minutes. It's huge! I mean, it was very, very interesting.
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EREN BERBER, MD: Yeah. Actually, we did not really go into the details with the literature, but there have been about four randomized studies about using the Harmonic scalpel versus the clamp and tie technique. And all of the studies come to the---

THIERRY DEFECHEREUX, MD: Yeah, to that point.
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EREN BERBER, MD: ..draw the same conclusion, about thirty minutes time savings.

THIERRY DEFECHEREUX, MD: Yeah, that's interesting. With safety, of course, because we---

EREN BERBER, MD: Exactly.
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THIERRY DEFECHEREUX, MD: ---are surgeons very interested in safety. And not only on looking at the time of the surgery, but if you can reduce the time by twenty-six minutes with the same safety for the patient, it's…it's a huge advantage.
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EREN BERBER, MD: And like you showed, a couple of other studies have shown decreased bleeding and a couple of them showed decreased hospital stay.

THIERRY DEFECHEREUX, MD: Of course. Of course.
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EREN BERBER, MD: And also suggested…Some of the studies suggested all were cost saves with the use of the Harmonic scalpel.
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THIERRY DEFECHEREUX, MD: So, okay, basically now it could be interesting for you to watch this procedure that was recorded two or three days ago here in Liege University. And then I will add, with Eren, some comment about this conventional open surgery. And don't forget that you have access to e-mail question to us and we will be very happy to start replying to those questions after this first part of the video. And I think we can run the video, actually.
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[Video begins – Left Side Lobectomy]
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THIERRY DEFECHEREUX, MD: So, as you can see, this is a quite common opening collar incision, six to seven centimeters. And immediately you see that after raising the superior flap, I am using the…the Harmonic scalpel to dissect and to open the midline. We…We almost never cut the strap muscles. As you can see---
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EREN BERBER, MD: Thierry, actually I wanted to interrupt. Do you raise the flaps, subplatysmal flaps with the Harmonic scalpel, or just the electrocautery?
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THIERRY DEFECHEREUX, MD: Well, no, to be honest with you, we're using monopolar at that step because it's faster, but you can do it with the Harmonic as well.
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EREN BERBER, MD: Yeah. Yeah, we use…we use electrocautery for the flaps too. I don't think you need it. It's just fast…It's a vascular plane.
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THIERRY DEFECHEREUX, MD: Yeah, that's…that's kind of difficult to change, yeah. So what I can mention at this very conventional approach that you will immediately see that we are

using the active blade without closing the shear. And it can be very helpful for opening the space between the muscle and the capsula. This…I really would like to invite you to test using the shear that way; not only closing the shear and cutting the vessels, but trying to dissect with the shear open. Trying to use the shear, even without activating the generator. It's…it's a scissor. You can try to use it to dissect and you will, at the beginning, be a little bit reluctant to do that, but you will come to that.
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EREN BERBER, MD: Thierry, can I interrupt? Where are you…What are those buttons that you are pushing? Can you explain to the audience?
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THIERRY DEFECHEREUX, MD: Well, this…yeah. Yeah. We have to warn you that there are on this ace device the…the very last generation, the opportunity to avoid using the foot pedal and to use the hand activator. With us, you know, min and max, which can basically be different in terms of speed of coagulating and cutting vessels and tissue. And, Eren, to be honest with you, I'm only using the min on level three. So…But it's up to you to use a level five or four even.
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EREN BERBER, MD: I think just to kind of make it simple for the audience, the minimum is used more for coagulation and the maximum is more…used more for cutting the property from the equipment. And---
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THIERRY DEFECHEREUX, MD: So do you mean you're using four…level three at the beginning and then when you think the…the vessel is sealed you are using level five to cut?
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EREN BERBER, MD: I think it…I think it's just a unique feature of how my scalpel is. You have control of the device and, you know, unlike some other competition devices, that you can control how you really seal the vessel. I mean, there are a couple of different approaches. The one I like is if it's a small vessel, less than three millimeters, and I like to go with the fast. But I'm sealing anything greater than three or four millimeters and I like to use the minimum function to establish better coagulation.
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And what I…I like to do is, I like to double seal the big vessels. Meaning that proximally I keep the minimum function of the device for about three seconds without dividing the vessel. Then I move more towards the thyroid and then I divide the vessel. And it gives you about a double seal. I think there---
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THIERRY DEFECHEREUX, MD: Yeah. It might be interesting in the beginning of the experience.
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EREN BERBER, MD: There could be comparative studies, but I guess it gives me more a sense of safety about the big vessels.
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THIERRY DEFECHEREUX, MD: Of course. I understand. May I just point that this approach of the superior pole that you are looking at, actually is…is quite [something?] like a revolution [unintelligible] surgery. Meaning that as you can see, the…the tip of the instrument is not dissecting the… the major trunk of the superior artery, [carotid?] artery. That the basic…And this is very an advantage of this technique is that we are just following the capsula of the superior pole and coagulating the distal part of the vessel, which are much smaller. And this can be a very fast step in the procedure.
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I remind you that this is a real live procedure and the superior pole actually will be completely mobilized in…in one minute, or one minute thirty seconds. Of course, you have to be very careful when going deep to the entrance of the recurrent nerve and the superior

parathyroid. But as you saw, the superior pole was completely mobilized in one minute to one-thirty minute, which is quite different from what we're doing when we have to tie this main [string?] of the superior artery.
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EREN BERBER, MD: And, Thierry, this is an excellent technique and I really have to compliment you on it, but just a comment of safety about the…the audience who is gonna use this device for the first time, is that the active blade can really get hot and you have to know your anatomy. You have to know where the recurrent nerve is, because if you have that active blade against that nerve then you are going to damage it. So for the beginners, I would emphasize using the inactive blade on---
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THIERRY DEFECHEREUX, MD: Sure, sure. I agree with you.
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EREN BERBER, MD: ---on the tissue. And, also, maybe the use of a fine tip [Kelly?] to define and come around your vessel, and then using the Harmonic scalpel to divide it. But I guess it…as you get more experience then you can proceed with your dissections along with your Harmonic scalpel too.
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THIERRY DEFECHEREUX, MD: Let me just briefly come back to the video, actually. As you will see the recurring nerve is---

EREN BERBER, MD: Looks like that's the nerve.
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THIERRY DEFECHEREUX, MD: ---is very clearly identified. And as you have noticed, this is the only step of the procedure where I change my instrument going back to conventional scissor. Because we…we have to respect the basic rule of thyroidectomy. I didn't find the nerve, so if you cannot see the nerve with the Harmonic, which can be dangerous and I would remind you the tip can be hot as fifty degrees, you have to change instruments. But this was the only step I changed the instrument.
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And, actually, you can see that I'm far away from the nerve to finish the lobectomy while cutting the [unintelligible] ligament without tying and without clipping in any step. And the parathyroid is right at the top, so this lobectomy was done in…in fifteen minutes quite safely without any bleeding, as you can see, any clips and any ties.
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EREN BERBER, MD: And, Thierry, I think the key to your technique is just hugging the thyroid capsule so that you don't injure the parathyroid or the nerve.
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THIERRY DEFECHEREUX, MD: Well, no, this is really safe. As you can see there are… Actually, I must say to the audience that we have already received many questions, so we will basically start trying to reply to those questions. And, Eren, you were speaking about the education and the training with the device, and there are some questions coming about…about how many cases do you need to become comfortable with the device? And if you accept our reply to this question, because I'm receiving a lot of visitors for that.
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You…you have to go through ten to fifteen case to be really confident with the device. And don't stop after one or two. That can be a little bit disappointing because you will have some bad experience. You have to learn how to redo the tension to the structure and to go slowly. You have the feeling or the sensation you are going slowly using the Harmonic, but by…by the end you will see how fast you can be with that.
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EREN BERBER, MD: Yeah, I think I would admit that you have to do about fifteen to twenty cases. If you would like here, I would like to make a couple of comments about the

technique. As…Or, every surgeon does it differently. There are a couple of differences in our technique that I would like to emphasize so that the audience can have an idea about how different you can do this procedure.
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First of all, making your incision, we generally use about a four centimeter incision for small thyroids. And we use a preoperative neck ultrasound to…to look at our pathology and also define where the isthmus is that we can center our incision. And afterwards, go up in the subplatysmal plane, flaps is the same. Then going with the strap muscles again without dividing is the same.
00:36:12
Then afterwards, what we do is we first mobilize the isthmus. What we do is we…with the extra cautery and this Kelly clamp, we raise a vas…we develop a vascular plane between the trachea and the isthmus will help you mobilize both the thyroid lobes. And afterwards, for retraction you use your hand, we use a peanut; anything could be used for that purpose.
00:36:36
And to get our residents more into the procedure, what we do we use a…use a fine tip Kelly or a…a mosquito and then come around the…the vessels as if you are doing the conventional surgery with clamp and tie technique, and use the Harmonic scalpel to…just to divide the tissues. And as you…as you show, actually, as you get more experienced, I guess you can just do the operation with the use of the Harmonic scalpel.
00:37:03
THIERRY DEFECHEREUX, MD: This is one of the questions that came up as well. As you mentioned and as I noticed at one visiting friend in U.S., are you using mainly the Harmonic tool to cut and coagulate the vessel instead of dissecting? You saw in my video that with the [experience?] I'm using it for dissecting as well, which I think is the normal evolution in the using of the Harmonic. But you basically are using it for cutting and coagulating?
00:37:30
EREN BERBER, MD: As you get more experienced, I think you can just use it for your dissection as well. What…Especially in teaching institutions where you want your---

THIERRY DEFECHEREUX, MD: Sure.
00:37:37
EREN BERBER, MD: ---senior resident or Fellow to be part of the procedure, we kind of got into that habit. But, obviously, with experience we can just use the Harmonic scalpel, which might be faster as well.
THIERRY DEFECHEREUX, MD: Um hmm. You know, what we do as we are working in a university teaching center as well, when I'm training…the training of the residents to use the Harmonic, I keep the control of the device while having the foot pedal myself. So which can be a good way to teach them safely.
00:38:00
EREN BERBER, MD: Yeah. Exactly. Exactly. And ---
00:38:03
THIERRY DEFECHEREUX, MD: Do you, Eren – as another questions came up about that – use the nerve monitoring, which is actually a new technology available for thyroid conventional surgery. What's your opinion about nerve monitoring?
00:38:15
EREN BERBER, MD: We don't use it, but I guess even though we have excellent technology to do our procedure, we shouldn't forget the basic principles. Which are the exposure, identifying your anatomy, which means that you have to define your recurrent laryngeal nerves before you become really cavalier in that area. And, if you don't identify it, even if you use extra care, even if you clamp and tie technique, you're gonna injure the nerve. So, whoever is doing this procedure needs to, after mobilizing the upper and lower pole vessels, need to see the nerve before you can dissect further.

00:38:54
And one actual safety that we have achieved, and we like to do, is at the ligament of [peri?] we don't use the Harmonic scalpel in contrasting. We just pull the safe onto, you know, if you identify the anatomy. But, at the ligament of [peri?] we refrain from using the Harmonic scalpel.
00:39:11
THIERRY DEFECHEREUX, MD: I think that we will…we will come to that technique. But to reply to…to react to your question or your reply to…about the nerve monitor---
00:39:18
EREN BERBER, MD: Yeah, we don't use it. We don't use it---
00:39:19
THIERRY DEFECHEREUX, MD: I must say that we are using it and this is not a topic to discuss. There could be a webcast only on nerve monitoring, but I must say that the more I use it, the more I like it. So this is another point.
00:39:31
EREN BERBER, MD: Yeah. And, actually, an important question is, do you feel that Harmonic can safely seal the superior pole? And I think that if you use the Harmonic, if you really get, of course, a large vessel which you want to feel psychologically better, use the double seal technique. And in our experience, if you use that technique correctly…and another thing is, we have to be patient. I mean, if you are…if you apply the Harmonic across the vessel, you have to wait patiently until the Harmonic does the job.
00:40:02
And one good feature with the Harmonic is, if it's gonna bleed, it's gonna bleed immediately there after you pull your equipment out of the wound. So you can maybe put a tie on it.
00:40:13
THIERRY DEFECHEREUX, MD: Yeah, of course. But to reply to this question from my side, you saw it in the video. I'm using it safely on the superior vessels. But the…the difference with conventional surgery is not…I'm not reaching the main trunk; I'm only going through the….
00:40:28
EREN BERBER, MD: Exactly. I mean, that's another principle---

THIERRY DEFECHEREUX, MD: …[terminal?] branch---
00:40:30
EREN BERBER, MD: ---of the main…I mean, conventional surgery. You have to go from medial to lateral. You cannot take the trunk. You can injure the superior laryngeal nerve.

THIERRY DEFECHEREUX, MD: So another very---
00:40:39
EREN BERBER, MD: So to follow the basics. So you follow the principles.
00:40:41
THIERRY DEFECHEREUX, MD: Another very basic questions, which come up very often about Harmonic is, how close can you go to the nerve? Can you react to that, Eren, and from your side?
00:40:51
EREN BERBER, MD: Well, if you look at the way…basic science studies about the Harmonic scalpel, the area of damage achieved with the Harmonic scalpel is slightly less than 1.5 millimeters. So, I still advise that, despite having done maybe more than a thousand thyroidectomies as a group with this device, you're still at the ligament of [peri?]. We see the nerve and put a Kelly clamp over the ligament of [peri?] and divide it and tie it. But, you're gonna see that the Harmonic will give you significant advantages in other places. But at that last part where the Achilles heel is, we have to be careful.

THIERRY DEFECHEREUX, MD: Of course.
00:41:32
EREN BERBER, MD: I mean, if you want to use the Harmonic, make sure that you are away at least 1.5 millimeters. But I still---

THIERRY DEFECHEREUX, MD: No, I completely agree with you.
00:41:38
EREN BERBER, MD: I wouldn't…I would still clamp and tie it. And what's…I don't know what's your opinion about that is.
00:41:42
THIERRY DEFECHEREUX, MD: Yeah. No, I fully agree with you on the…on the minimum distance, 1.522 millimeters. And more is better. Again, it's always the same reply I have about that. Try to take thirty seconds to increase the distance from the [unintelligible] you will cut and the nerve. Three is better than two, and four is better than three, of course. And, if you are too close, just do like you recommend, use a tie…a [unintelligible] tie and it will be safer for the nerve. But 1.5 and maybe 2 is the safest way.
00:42:15
So, Eren, it's impossible when discussing about thyroid surgery actually to avoid the question about [unintelligible] technique in video. Although full video or video assisted thyroidectomy, if you will comment on that with…in the context of those new energy that are available, actually.
00:42:37
EREN BERBER, MD: Well, my opinion is that, I mean, when we do our thyroidectomies for most of the patients who have nodules up to 2 to 3 centimeter, we are able to use procedure for a 3.5 or a 4 centimeter incision. If you look at the literature, the mean size of the…of the incision is for this video assisted technique is about 2.9 millimeters. 2.9 centimeters, sorry. So the amount of advantage you get regarding the incision size versus the risk you take, I don't justify it. And despite we have all the technology available, we don't believe that it's gonna give you so much advantage in all of the patients.
00:43:26
Maybe in selected patients, if you're a top model…[chuckles]…I guess you can do it. But in most of the patients I don't think it makes a difference.
00:43:33
THIERRY DEFECHEREUX, MD: So we all admit that there are some good indications, but very selective group of patients.

EREN BERBER, MD: Yes, very selective group of patients.
00:43:38
THIERRY DEFECHEREUX, MD: And those team in Europe mainly, and in U.S. who are doing video assisted surgery are doing it very well and very safely, as you probably all know. But, we all admit that the vast majority of thyroidectomy are still done in the open conventional way.
00:43:57
EREN BERBER, MD: And, Thierry, there are a couple of actually good questions. One of them is about the economical cost of the Harmonic scalpel for this procedure. If you would like to comment on that?
00:44:08
THIERRY DEFECHEREUX, MD: Yeah, I can briefly comment on that. And the data we're talking from [unintelligible], if you reduce your operative time by thirty to fifty percent, you will do more surgery in one day. So any discussion about the economic cost of the hand piece, which can be a discussion, will disappear, as you will do in the same time one more case. So, this is my reply to that.
00:44:31

EREN BERBER, MD: And, actually, I'm just gonna give my…more data. You know, if you save about thirty minutes with an average thyroid surgery, the hand piece in the United States – I don't know how much it costs in Europe – costs about three hundred dollars. And about a minute in the operating room costs roughly twenty…twenty dollars. So if you save about thirty minutes, it will make about six hundred dollars and the hand piece is three hundred dollars; just about double the saving for it. And you also save the patient so much time from anesthesia.
00:45:01
One can argue that you're gonna have to buy the generator, but the Harmonic scalpel is used by many other procedures and many other specialties, including Gyn, Urology or other groups that…I think the cost for a generator, which is about ten thousand dollars, for a hospital is going to be made reasonable for a thyroid surgery.
00:45:22
And, one…There's another question about how is Harmonic different from ligature. Did you want to comment on this?
00:45:31
THIERRY DEFECHEREUX, MD: Well, yeah, briefly, so ligature technology is bipolar technology. Of course, at some point a hand piece from this ligature could be…could appear as a little bit more adapted to neck surgery, actually. But I think this will change in the future. But, basically, this is not the same device. It's conventional bipolar hand piece and you have to cut the place where you have sealed the vessels, so you have to change instrument.
00:45:58
And one of the more interesting advantage with the Harmonic is that it's all in one instrument. You dissect – as you saw in the video – you cut and coagulate. So this is my reply – it's a bipolar, so the temperature is still higher than the ultrasonic. You mentioned it is difficult to find a good angulation of the hand piece. So, for me, this is not as advantageous a device as the Harmonic can be, from my side of it.
00:46:26
EREN BERBER, MD: Yeah. I think that…I mean, either the RF technology used by ligature versus the ultrasonic technology, they're all suitable, including the bipolar technology, is suitable for…for the thyroid surgery. But the thing is we have equipment designed ergonomically for this procedure and currently the Harmonic scalpel is more suitable for this procedure, based on the type of the hand piece and the blades that are available.
00:46:57
THIERRY DEFECHEREUX, MD: Eren, I think that there are a lot of questions coming up. And thank you very much for that, but we have to go a little bit more in our very briefly data and to finish the second part of the video, actually.

EREN BERBER, MD: Sure.
00:47:09
THIERRY DEFECHEREUX, MD: So, you…you might be interested if we can have the next slide. Actually…Oh, we are actually six or seven years after the beginning of the use of this technology. What we can analyze are the scientific point of view as evidence based medicine or surgery data available. Actually, this is what we connect from all the company, actually, in terms of safety, the size of the vessels. We can coagulate and [cut?] very safely.
00:47:37
And as you can see, on the red plot the filter sonic is probably not the best, actually, because of course, you can tie. And you can use the ligature, the bipolar energy for some bigger vessels, but we are talking here about high rate surgery and you will never have vessels up to seven or eight millimeters. So, basically, for all the vessels you can…in the face and the neck, Harmonic energy is completely great.

00:48:03
So how can you compare all those different devices available? Actually, so you can compare the bursting pressure. Meaning that you [inflate?] some liquid in vessels, seal the different device. And according to the literature available, you will see that for vessels of four to five millimeters, all device are equivalent in terms of safety. And this is not a secret for anybody that up to seven millimeters, the bipolar ligature is safer. But we're talking, as I remind you, about thyroid surgery.
00:48:36
And, of course, if you measure the [unintelligible], the advantages for the Harmonic, according to many of those studies available…And while this is quite a busy slide, but we're briefly going through that. This…The selection of different study available, actually in the worldwide literature, and we tried to rate those different study according to evidence based [skill?] running from 1, 2, 3A. And, of course, the study all have the much [poorer?], all the prospective randomized study.
00:49:08
And if we compare in all those four study at that time available, the…the advantage in times of time saving, you will see that the reply in time saving is immediately yes for all study, comparing conventional to ultrasonic dissector. And if you do the same study about the bipolar device, you will see that the people who have been running the study honestly replied that there is no advantage in terms of time saving.
00:49:39
So if I can briefly go through this technique you have been seeing in my video and if [culture?] accepts that I'm actually saying that the technique has changed. It's kind of a revolution. What we are doing, actually, is not any more to dissect the main trunk of the vessels and the main trunk of the superior artery, as you can see on those whole slide at the beginning of our experience. But, actually, what we are doing is to approach the capsule of the thyroid and not dissecting anymore the main trunk, not approaching the superior branch of the nerve. And, dissecting the superior pole very briefly, as you saw, while sticking the capsule of the thyroid.
00:50:23
So this is a picture from the video, and you see that we are sticking the capsule. And this is the end of the surgery. You will see we never use any clips or any tie for the whole lobectomy.
00:50:35
So those are data from our experience. And I will briefly go, because it's also a very busy slide including more than one thousand cases of our experience. And one of the major advantages is that we are actually doing, as a mean time, all thyroidectomy in forty-six minutes, running from range from twenty to less than one hour. And, you know, in our own experience we improve our time from…for thirty-six person. Remember…If you can remember the very first study, we were dealing with one hour and ten minutes and, actually, we are doing forty-six on the mean operating time of those one thousand and two hundred cases.
00:51:16
So, I think it's time now to go to the second part of the video and we can, again, receive all your questions. And we're getting a lot, actually. Thank you very much. And we will comment, again, on the right side of the thyroidectomy with Dr. Berber.
00:51:29
EREN BERBER, MD: Yeah, we'll try to answer some of those questions during this video.
00:51:32
THIERRY DEFECHEREUX, MD: Okay. So we can watch the second part of the video.
00:51:35
[Video begins – Right Side Lobectomy]
00:51:39

EREN BERBER, MD: I would like to, again, encourage those who are skeptical about the use of the Harmonic scalpel for the upper pole or the lower pole vessels, think about the use of the Harmonic scalpel for laparoscopic [unintelligible]. And as the many studies have shown that the Harmonic scalpel alone can seal the short gastric vessels, which are much larger vessels compared to thyroid vasculature. And especially use of the double seal technique can really give you a good hemostasis. And you can see if you're going to have a good hemostasis or not while you are doing the procedure.
00:52:12
THIERRY DEFECHEREUX, MD: So once again you can see this…this kind of a new technique to mobilize the superior pole. I'm not trying, on the video, to raise the main trunk. I'm dissecting the muscles away using the open blade, activating the generator, pushing away the muscles and reaching the superior pole, but not the main trunk of the superior [carotid?] artery. And we will very briefly mobilize the superior pole.
00:52:39
EREN BERBER, MD: As I mentioned when we're doing this we have a peanut and sometimes we use a Kelly clamp to pull and bring the upper pole to you and you dissect the vasculature with a fine tipped Kelly clamp. Just a variation of the technique.
00:52:54
THIERRY DEFECHEREUX, MD: Yeah. Now it's an important point to mention that you have not to put too much tension on the structure you're coagulating with the Harmonic.

EREN BERBER, MD: Exactly.
00:53:03
THIERRY DEFECHEREUX, MD: As it can really be dangerous, in terms of the speed of cutting the vessels. And this is something you have to learn in your very initial experience, but it's…I also have to recommend something – as you might see on the video the active blade is down, which is something at the very beginning of your experience and you have to try to avoid to be confident. But I'm pretty sure that you will naturally come to that use of the---
00:53:30
EREN BERBER, MD: Yeah. I would still…For the start I would…I would recommend them to use the inactive blade against the tissue to prevent any injury to apparent anatomy.
00:53:40
THIERRY DEFECHEREUX, MD: So as you see also, oh, you can dissect with the instrument without taking the scissor---
00:53:45
EREN BERBER, MD: Yes. It's very [unintelligible]---
00:53:47
THIERRY DEFECHEREUX, MD: You can push the stretcher. You can open the shear and dissect as with a conventional scissor. And this is very important, you avoid changing instrument and you will reduce your operative time very safely.

EREN BERBER, MD: Exactly.
00:53:59
THIERRY DEFECHEREUX, MD: But be careful as well if you have been activating the generator. In the four or five seconds following the tip of the instrument can be a little bit hot.

EREN BERBER, MD: Exactly.
00:54:09
THIERRY DEFECHEREUX, MD: So, remain very careful if you are close to the nerve of the parathyroid.
00:54:14

EREN BERBER, MD: Exactly. And, actually, one of the questions was regarding any burns with using this device. Obviously, if you use the instrument, don't put it on the skin and don't put it on any vital structures, like the trachea. We haven't had any complications related to this, but this could happen.
00:54:29
THIERRY DEFECHEREUX, MD: Oh, yeah. You…We have to…To be honest, and it's in our data, we have a trauma of the trachea if the active blade is touching the trachea. It can be very [unintelligible] and you have to be very careful with that.
00:54:43
EREN BERBER, MD: Exactly. And---

THIERRY DEFECHEREUX, MD: With the skin as well.

EREN BERBER, MD: Exactly.
00:54:44
THIERRY DEFECHEREUX, MD: At some point you have to protect the skin if you're working very deeply in the neck.
00:54:49
EREN BERBER, MD: And when you're using the Harmonic scalpel, the hand grip is very important. I mean, you have to really grasp the tissue and the…have a good hand grip, because if you don't…if you don't provide that, you cannot really seal the tissue well.
00:55:08
THIERRY DEFECHEREUX, MD: Okay, so we'll…You probably all know this technique, which is quite conventional. The main difference is that I'm not using tying and the clips. And you'll see the branch of the artery are safely cut and coagulate. And in this part of the procedure, I will also change the instrument because the nerve and the superior parathyroid doesn't come up immediately. So in this situation, don't try to use the Harmonic for the whole procedure. Take your scissor or your Kelly, or anything you want to do conventional dissection.
00:55:42
EREN BERBER, MD: After you've taken the upper pole and the lower pole down, you have to identify the nerve. And there…you cannot proceed any more [blindly?] with any other… whatever equipment that you have.
00:55:54
THIERRY DEFECHEREUX, MD: So this is the inferior pole of the thyroid. That will be mobilized safely.
00:56:02
EREN BERBER, MD: I have to mention that if you're doing a lobectomy the Harmonic is excellent to go for the thyroid tissue.
00:56:07
THIERRY DEFECHEREUX, MD: Yes, yes.. Oh, yes. For the isthmus. Exactly. I agree with you---
00:56:08
EREN BERBER, MD: It's just…just…It's excellent hemostasis and division.
00:56:16
If we don't have time to answer all of the questions, we can reply to them via e-mail after the webcast. So feel free to send your questions.
00:56:26
THIERRY DEFECHEREUX, MD: So, Eren, you see what I'm doing actually with the scissor is looking for the---

EREN BERBER, MD: Exactly.

THIERRY DEFECHEREUX, MD: ---nerve in the parathyroid.

EREN BERBER, MD: Exactly.
00:56:32
THIERRY DEFECHEREUX, MD: So, basically, you mentioned at the very beginning of the webcast that's the basic rule of thyroidectomy is still to tag the nerve, and that's what we are doing, actually. And I promise you that this thyroidectomy done several days ago was completely finished in thirty-five minutes, skin to skin. And it's not a problem to go back to the scissor to look for the nerve---
00:56:55
EREN BERBER, MD: Yeah, excellent technique. Yeah.
00:56:57
THIERRY DEFECHEREUX, MD: And this is basically the superior parathyroid, and as very often the nerve is right behind.
00:57:03
EREN BERBER, MD: And if you just hug the thyroid's capsule, you can also stay away from the parathyroids.
00:57:14
THIERRY DEFECHEREUX, MD: So, Eren, I think you will, after having watched this video, probably change a little bit your technique of dissecting with the Harmonic. [Dr. Berber chuckles] And I'm very happy to have you here in Belgium. And, you're welcome in the OR with me. I will appreciate it very much.
00:57:27
EREN BERBER, MD: Yeah. [Chuckles.] Exactly. My residents are going to be mad with me.
00:57:34
THIERRY DEFECHEREUX, MD: [Chuckles.] So, basically, this is something approaching the end of the right lobectomy, mobilizing the inferior pole. The superior pole is completely mobilized. We have identified the nerve. We have identified the superior parathyroid. The inferior parathyroid is not basically searched for a long time. As we are sticking the capsula of the inferior pole, we don't necessarily look for the inferior parathyroid. Once you are [assured?] about that, do you look for also parathyroid or…?
00:58:03
EREN BERBER, MD: Well, it depends on what the case is. If it's just a thyroid case, I hug the thyroid capsule and look at my specimen when I do my dissection to make sure that I don't have the parathyroids with my specimen. And as I've mentioned, here it just is…what's different from our technique is here after identifying the nerve I will put a Kelly clamp underneath the thyroid parenchyma and divide the ligament of [peri?] and then tie it. Then afterwards proceed with the Harmonic scalpel, just for the audience. But what Thierry is doing is perfectly acceptable, if you know your anatomy.
00:58:34
THIERRY DEFECHEREUX, MD: I agree with you. And you will see how I mobilized the superior parathyroid. Actually, this is one of the advantages with the technique. You can go very close to the parathyroid and mobilize. Once again, I go back to the conventional instrument for safety. The nerve is not far, so let's be very careful.
00:58:52
And, actually, we're coming up to the end of this lobectomy. The trachea…[pause]…nothing. We are approaching---
00:59:02
EREN BERBER, MD: Do you put a drain, Thierry?

00:59:04

THIERRY DEFECHEREUX, MD: Well, no. We…we stopped using the drain more than ten years ago.
00:59:07
EREN BERBER, MD: Yeah, we don't use it either.

THIERRY DEFECHEREUX, MD: Okay, that's---
00:59:09
EREN BERBER, MD: But I guess for big goiters, I mean, some goiters, if you have a lot of [raw surface?] you can put it.
00:59:15
THIERRY DEFECHEREUX, MD: Okay. So, Eren, I think we have come to the time of this webcast. Actually, I think we have to close this session to thank the audience. And we know from feedback that a lot of people were watching the webcast. We received several question and we have not time enough to reply to all of those questions. But tonight was a great pleasure to interact with you. I hope you will receive a reply comfortably from your hospital or your home. And I hope you appreciate this sharing of opinion about surgery, conventional surgery.
00:59:47
EREN BERBER, MD: It's been a pleasure. And thanks for being with us.
00:59:53
NARRATOR: This has been a live international webcast presentation of an open conventional thyroidectomy, using only an ultrasonic device. From the University Hospital of Liege in Belgium. For more information about this webcast, just click one of the request information buttons this screen.

This program is made possible through an educational grant from Ethicon Endo-Surgery.
01:00:15
[End OF WEBCAST.]