

NAOHISA

Thank you, Stavros, for your kind invitation to this wonderful Long Island course, and it is always a great pleasure being here. Today, my task is to talk about different traction techniques and other assisted techniques for challenging ESD cases.

YAHAGI:

Basically, ESD is a wonderful technique through which we can achieve reliable en-bloc resection regardless of size and location of the tumor. But in the case of having fibrosis under the lesion, or in the case of having a lesion at a difficult area, sometimes it's very difficult to do submucosal dissection. Then, we will need some technical tips which help our submucosal dissection procedure, such as a traction device, or such as a new platform to give us more stable conditions.

Regarding traction technique, my young colleague, Dr. Uraoka, presented the double-scope technique, which assists with the easy submucosal dissection. For large rectal lesions, my colleague introduced a second outer thin endoscope alongside the main endoscope. Then you catch the rim of the dissected area with the second outer thin endoscope, then open the submucosal space. This is very helpful for the bigger lesions, but sometimes the endoscopes themselves interfere with each other because of the friction. That's why we rarely use this technique nowadays.

And the spring-action clip is a more simple and very effective device for the medium-sized lesions, such as a 5-centimeter laterally spreading tumor. As you can see here, this device has a small spring together with a small loop, which is already attached to the metallic clip. And then we can introduce this device very easily through the working channel after installing this device into the outer sheath and catch the rim of the incised area with the endoclip.

Then capture this loop part and clip it to the other side. As a result, we can widely open the submucosal space. This is a very simple technique, but usually very effective for the medium-sized lesions.

And as Dr. Zhou already mentioned, clip and line traction technique is also a very simple and a very effective way to do difficult ESD procedures in the stomach, esophagus, and also in the colon.

This is a relatively large duodenal flat lesion located at the duodenal bulb. I already dissect most of the submucosal layer from the oral side, but at the end of the submucosal dissection it becomes very floppy. Therefore, we decided to use endoclip and line traction technique, introducing the standard endoclip through the working channel, we made a knot on the metallic clip. I usually use around 1.5-cm usual surgical string, and my assistant made a double knot on the tip of the metallic clip to ensure the stability.

Then, we cut the tail of the surgical string. Then, I pull back the endoclip into the working channel and go back to the targeted area. Then, carefully open the endoclip and catch the backside of the dissected area within the duodenal bulb. Now you can see the submucosal side of the dissected specimen, and we carefully catch the submucosal layer with the endoclip, and pull the string and clamp it using the surgical clamp. As a result of keeping tension, we can easily open the submucosal space.

And usually, the final part of the submucosal dissection becomes very difficult because of the floppiness of the remaining tissue, but by giving traction, it becomes very easy. I completed the submucosal dissection in underwater conditions because in order to avoid smoky situations or light reflection, underwater conditions were quite helpful.

Another trick is clip and snare traction method. For this technique, we have to align a thin type snare along the rim of the transparent hood before introducing the endoscope through the lumen. Then, after completing the circumferential mucosal incision, we can apply the endoclip at the edge of the dissected area.

Then, soon after applying the endoclip, we should catch the tail of the endoclip using the snare wire. Then we can give traction to that target tissues. This is also very simple and a very cheap technique. We can apply this technique even for the big lesions located at a deeper part of the right-sided colon.

Another new device is the Endo Trac. This is already commercially available only in Japan. This was developed by Dr. Toyonaga. This is very simple. Loop thread through the outer sheath. We can close this loop thread by pulling this handle. Then we can catch the edge of the metallic clip, and then we can easily introduce this device together with the endoscope.

After catching the edge of the dissected area, we can give traction to the target tissue, not only by pulling back the lesion but also by pushing the lesion. It's relatively convenient when the lesion is located at the lower rectum or in the greater curvature side of the stomach.

And Endo Lifter is my own device. This is also a very simple traction device. It is grasping forceps attached to the transparent hood by the metallic wire. When we push out the grasping forceps, it comes just in front of the endoscope. Then we can catch the target tissue.

This is a very big soft protrusion located at the greater curvature side of the stomach, and in this situation, we cannot utilize gravity because this is located at the gravity side. Therefore, submucosal dissection usually becomes very difficult. That's why I decided to use this special traction device.

Initially, we should cut the surrounding tissue by standard ESD technique. I started my procedure from the inner side in the retroflexed position, injected glycerol solution to the submucosal layer and carefully start mucosal dissection and the initial submucosal dissection in the retroflexed position. I am currently using a 2-mm Dual Knife J, which has injection capabilities through the knife. Therefore, we can inject solution at any time if it is necessary.

The initial part was a little bit unstable because of the retroflexed position, but it was possible to do the initial mucosal incision and the submucosal dissection without having any difficulties. Now I'm conducting the submucosal dissection, step by step, from the anal side. Then I injected additional solution through the submucosal layer through the knife. It is very convenient. Then I continue the submucosal dissection a little bit more in order to open the submucosal space much wider. We don't have to conduct submucosal dissection too much because we can use countertraction afterwards.

So I stopped the submucosal dissection, then switched back to the other side and attached this Endo Lifter to the endoscope and introduced the endoscope and Endo Lifter through the overtube. And back to the target lesion. And again, injected solution to the remaining surrounding tissue through the knife and conducted the remaining mucosal incision at the other side. It becomes a little bit unstable because of the floppiness of the endoscope within the straight position. But carefully, we made our mucosal incision and made our partial submucosal dissection, and finally applied the Endo Lifter at rim of the incised area. Then lift up the target lesion.

By pulling back the grasping forceps, we can easily open the submucosal space. As a result, the following submucosal dissection becomes very easy and very safe. You can easily recognize the blue-colored submucosal layer, which was colored by indigo carmine, and we can easily distinguish between the muscle layer and the submucosal layer. Of course, maneuverability of the endoscope becomes a little bit poorer after capturing the target tissue by the Endo Lifter, but by giving countertraction, the submucosal dissection process was quite easy. And we can retrieve the resected specimen very easily.

This was a nearly 5-cm region, but I could dissect the submucosal tissue within 15 minutes by using the Endo Lifter. Another trick is magnetic anchor-guided ESD. This was already presented by Dr. Zhou. This is a small neodymium magnet anchored at the edge of the dissected area in the stomach or colon. Then we can pull this small anchor from the outside using a much bigger neodymium magnet. We can control the direction of the traction, in any direction, by moving the large magnet from outside. This is also a very helpful device to conduct a difficult ESD procedure.

And there are some new platforms for difficult situations. Sometimes approaching the target lesion in the right-sided colon is very difficult because of the adhesion of the colon or the long and the flexural structure of the colon makes it very difficult to approach the target lesion. Then, we can use a balloon-assisted colonoscope, like Fuji's double balloon colonoscope. By using a double balloon system, we can easily approach the difficult area.

Olympus also has a balloon-assisted overtube into which we can introduce standard therapeutic colonoscopes through the large working channel of this large sliding balloon. This is also very convenient.

And in the case of having very difficult gastric lesions, such as a large lesion located at the gastric fornix, we can use a very special endoscope, such as a multi-bending endoscope. Unfortunately, this endoscope is only available in our country, but by using a second bending part, we can approach the very difficult areas, such as the gastric cardia or the gastric fornix. By using this special function, we can remove these kinds of very difficult lesions without any serious complications. This is the beauty of the multi-bending endoscope.

And an American company. Now Boston Scientific built this Lumen-R technology and is developing a new platform for difficult colorectal ESD procedures. By opening the small chamber, you can have very stable conditions, and you can use articulated grasping forceps through the overtube. This is also a helpful device for the medium-sized colorectal lesions like this.

And Lumendi also launched a kind of balloon-assisted overtube. You can clip the dissected area to the fore balloon, and if you push the fore balloon from the endoscope, you can open the submucosal space. This can be used for giving countertraction to the remaining submucosal tissue. I think this is helpful for the larger lesions located at the right side of the colon.

And other new techniques are the pocket-creation method and the water pressure method. We started the ESD procedure for the purpose of removing gastric lesions in the past, but nowadays we are applying the ESD technique not only for the gastric lesions, but also for more difficult lesions, such as colonic lesions or duodenal lesions.

And duodenal ESD is completely different from other ESD procedures because we cannot create a sufficient submucosal fluid cushion even if we inject a relatively large amount of solution. And the incision line usually doesn't open well because the muscularis propria doesn't contract well after making the mucosal incision. That's why the following submucosal dissection is always very difficult in duodenal ESD.

In order to overcome this difficult situation, Dr. Yamamoto's group created the pocket-creation method. In this technique, they usually make an initial small mucosal incision at the proximal side and quickly go into the submucosal space utilizing an ST hood. An ST hood is a cone-shaped special attachment. By using the small-calibered tip, we can easily go into the submucosal space.

By stabilizing the tip of the endoscope within the narrow submucosal space, they can easily continue the submucosal dissection. And after completing the submucosal dissection, they usually make a circumferential mucosal incision and remove the target lesion. This is very helpful for the medium-sized duodenal lesions, or even for the big colorectal lesions.

But I think that sometimes the pocket-creation method becomes very difficult because maneuverability of the endoscope is a little bit poor in the narrow lumen of the duodenum. Therefore, we developed a new technique, which is the water pressure method. By flushing normal saline through the working channel using an ST hood, we can easily open the submucosal space after making a mucosal incision. This is very helpful even for the very difficult duodenal cases.

This is a relatively large duodenal lesion located at the superior duodenal angle. Half of the lesion is located behind the [INAUDIBLE], so this was a very difficult case. I did the submucosal dissection by using water pressure. By giving water pressure, we can open the submucosal space. As a result, the following submucosal dissection becomes relatively easy and safe. Then we could achieve complete margin-free resection, even for this very difficult lesion.

I think the balance between risk and benefit is very important when we conduct therapeutic endoscopy, especially ESD, because the risk of the procedure is relatively high in ESD. So please think about the balance between risk and benefit, and I hope the countertraction technique will help you to do a safe ESD procedure.

Thank you very much for your kind attention.