

NAOHISA

Thank you very much, [INAUDIBLE], for your kind invitation. And the first of all, I would like to congratulate the 10th anniversary of this wonderful [INAUDIBLE]. Well, I would like to talk about the difference and the features of ESD devices and the [INAUDIBLE] to use each device and how to use it.

YAHAGI:

This is my disclosure. There are many commercially available ESD devices around the world. We have to understand the feature of each device and to carefully select an appropriate one for our own procedure.

I think that the IT knife is the most popular ESD knife, at least in Japan, because we have lots of gastric cancer patients in our country. We're currently doing more than 50,000 ESD-- gastric ESD cases per year in our country. Therefore, still IT knife is the most popular device for doing ESD.

And this is a kind of insulated tipped device. There is a small ceramic part at the tip of 4 millimeter long blade. And it can cut now very well when we press down this device to the target tissue. And of course, as a result of having ceramic tip at that tip, we can avoid now the risk of perforation during the procedure. And we can cut through relatively large amount of tissue with the four millimeter blade.

But unfortunately, because of the presence of the ceramic tip, we should twist our endoscope to make it possible to contact to the target tissue. It is a relatively strange maneuver for the ordinary endoscopist. Therefore, it takes a relatively long time to acquire enough skill to control this device. And, of course, this is only available for gastric ESD procedure.

And in order to make it possible to control IT knife much better, some of the specialists for ESD, IT knife ESD procedure developed the IT knife 2, which has a small blade backside of the white ceramic tip. This small blade make it more easier to cut the target tissue. Even for the lateral direction, it becomes quite easy.

As you can see here with this short video clip, just insert the small tip of the ceramic tip to the hole. You can start the macos or incision and you can target tissue very quickly. And even for the lateral direction, it becomes very easy to control that device. And now as a result, we can finish the gastric ESD procedure relatively fast. This is the most important merit of this

technique.

But its also only available for gastric ESD procedure, because of the relatively very large ceramic tip at the end. So in order to make it possible to use that IT knife even in esophagus or colon, National Cancer Center group may make a much smaller IT knife, which called IT nano. The ceramic tip becomes much smaller than before. And there is a small disk spot right below the ceramic tip.

Therefore, we can control this device more smoothly even within the narrow lumen in the esophagus or colon. But now, of course, if there is some [INAUDIBLE] in the colon, it becomes quite risky. Because still this ID nano has 4 millimeter long blade. Sometimes it cut the muscle really quickly.

Therefore, we should be very careful when we use this device in the esophagus or in the colon. And I think that hook knife is the safest device, because we can cut the tissue by pulling back manner, just hooking target tissue with this hook part. And this hook part can be rotatable. I mean, direction of the tip is adjustable by torquing our hand.

So this is very convenient in case of having severe fibrosis due to previous endoscopy resection or due to peptic ulcer disease. And this is a very safe device, because, as I mentioned, now we can cut target tissue by pulling back manner. But it also has some demerits, because we should control the device before using it, adjusting the angle of the hook.

It is sometimes very much troublesome for our assistant. They have to learn how to control the direction of the hook knife very precisely. But once we get to use it, it becomes very convenient, especially within narrow lumen or very difficult situation with severe fibrosis or remitted maneuverability of the endoscope.

Still, we can cut the target tissue. By adjusting the angle of the hook knife, we can catch target tissue more precisely. And we can cut the target tissue by pulling back manner.

And currently, Olympus have new generation of hook knife, which called hook knife J. J means Jet function. By pressing the hook pedal of the water irrigation pump, we can inject additional solution directly to the submucosal area.

It already got the FDA approval. But, unfortunately, it is not commercially available yet. But I believe that Olympus will launch this device quickly even in US market.

And as everybody knows, TT knife is the best device for the POEM procedure. You already saw some Professor [INAUDIBLE] procedure during his talk. This device has a triangle tip at the end of the long blade.

You can catch the target tissue with triangle shaped tip. And, of course, you don't have to change the direction of the tip. This is one of the merits of this device.

But, unfortunately, because of the relatively big triangle shape the tip, it sometimes cause relatively wide thermal damage. Therefore, Professor [INAUDIBLE] developed a second version of TT knife, which is TT knife J. It also has water injection capability. And the disk part becomes much smaller than the previous one. But, still, it's very effective to catch the target tissue with the small triangle-shaped blade

And the flex knife is my original device. My concept was to minimize the tissue damage with the shorter needle type device. And this was originally developed from the [INAUDIBLE] loop snare, so that the shape of the tip of this device is very similar to the snare wire, [INAUDIBLE] snare wire.

It is blunt-ended. And the knife length is adjustable according to the circumstances. Therefore, it is relatively safe and easy to control in any direction.

And this device is available for placing marking dot, for making mucosal incision, and, of course, for submucosal dissection. And even for the hemostasis, we can use very short length tip of the flex knife. So it is kind of all-in-one device.

But, unfortunately, this loop-shaped tip becomes dirty very easily during a procedure, especially right after the hemostasis. Therefore, I developed another short needle type device features dual knife. This is more convenient than flex knife, because we don't have to adjust the knife length during the procedure.

We have two different lengths of dual knife. 1.5 millimeter dual knife is very good for a esophageal or a colorectal ESD procedure. And 2 millimeter dual knife is very good for gastric ESD procedure.

And there is a small disk part at the tip of the metric part, so we can hook the target issue with this small disk part. And even after complete reclosing the metric tip, still small disk part remaining on the surface of wide ceramic tip. Therefore, we can use the small disk part for

pressing marking dot or for the hemostasis-- I mean, hemostatis from the tiny blood vessels.

But, unfortunately, previous version doesn't have any injection capability. And the dissection process is relatively slower comparing with IT knife. So we developed injection capability furnished dual knife, which called the dual knife J.

This is also a new product from Olympus. And they already cleared FDA approval. And we are waiting for the commercially available device here in the United States.

Fortunately, I can show you how to use it during my lab demonstration today. And the flush knife BT is very similar to dual knife J, because it has water injection capability. And the knife [INAUDIBLE] is more rigid than dual knife.

Therefore, they can make mucosal incision and submucosal dissection in a more stable condition. But as a result of having relatively thick outer [INAUDIBLE], they cannot suck the liquid during the procedure. That was the drawback of this flush knife BT.

Therefore, they decided to make a much thinner [INAUDIBLE] for the flush knife BT, so it becomes more similar to the dual knife J. And blade of the flush knife BT is really a bit thicker than dual knife. Therefore, it requires a little bit higher electric current to do mucosal incision and submucosal dissection. But the usage of this device is quite similar to the dual knife J.

And the hybrid knife is the most popular device here in the United States. It has a more powerful injection capability. Without making any hole, you can easily inject some solution to the submucosal area with the high pressure of the hybrid knife. So this is a kind of all-mighty device for pricing marking dot, making submucosal incision, and, of course, submucosal dissection, and also hemostasis.

But, unfortunately, still hybrid knife is relatively rigid. And knife length sometimes changes during the actual procedure. Therefore, it's sometimes a little bit difficult to adjust the knife length, especially within the narrow room in the colon within the [INAUDIBLE] position.

So please be careful not to use the long length hybrid knife. It is sometimes risky. But if you carefully adjust the knife length and carefully select the good the setting of the RF generator, you can conduct ESD procedure very smoothly with this hybrid knife.

Clutch cutter is a very unique device which looks like grasping forceps. But it has cutting ability. Outside of the clutch cutter is insulated. But after catching the target tissue with these grasping

forceps, you can cut the tissue using end-cut mode or some other cutting mode.

And the usage of this device is quite simple. Like taking a biopsy from somewhere, you can use this device. It is a user-friendly device, especially for the Western doctor. Just control the direction of the grasping forceps, and catch the target tissue, and apply the electric current to cut the target tissue.

Of course, the process of cutting tissue becomes intermittent. It means it is a relatively slow procedure. But it is very user-friendly especially for the Western doctors.

And I think SB knife is nearly the same as clutch cutter. It has also grasping forceps, with the insulation outside. And usage is quite same as clutch cutter. You can just catch the target tissue with the long blade of the SB knife. And after confirming the capture of the target tissue, you can switch on the electric current, then get a nice submucosal dissection.

Well, basic strategy of ESD is completely different between IT knife family and other ESD devices, such as short needle type devices. For IT knife family, they usually make a circumferential mucosal incision at the beginning of the procedure, basically making an incision from distal side to the proximal side by pulling back manner. And after completing the circumferential mucosal incision, they quickly start submucosal dissection, again, from distal side to the proximal side.

Because of the long blade of the IT knife, they can cut some mucosal tissue relatively quicker. Therefore, a circumferential mucosal incision at the beginning of the procedure is very common before the IT knife technique. But for the short needle type device, it is necessary to keep the healthy mucosa surrounding the target tissue.

And we use every start the initial mucosal incision from the proximal side and, right after making initial mucosal incision, quick start the submucosal dissection from the same position. Because if we make a circumferential mucosal incision at the beginning of the procedure, injected solution easily disappears from the inside area. And because of the short electrode, we cannot cut the submucosal tissue quickly.

Therefore, we should keep the sufficient amount of submucosal fluid cushion at any time to keep the safety of the procedure. Therefore, we usually make a partial mucosal incision, then quickly start the partial submucosal dissection at the same endoscope position and then step ahead to the distal side step by step. That is the usual strategy for the shorter needle-type

device.

And when should we use each ESD knife for our procedure? I think IT type device is very good for the gastric ESD procedure, because you can cut target tissue relatively quickly. And if you want to accelerate the submucosal dissection after making circumferential mucosal incision in the esophagus or even in the colon, you can accelerate the procedure time for the submucosal dissection using IT knife nano. But still, it's a little bit technically demanding procedure.

And short needle type device, such as dual knife or flush knife, it is kind of all-mighty device. You can use those kind of short needle type device for any kind of ESD procedure from placing marking dot until completely removing the target tissue. And you can also use for the hemostasis.

And hook knife is very useful when we have some difficulty to open the submucosal space with some fibrosis caused by previous endoscopic resection or peptic ulcer disease. We can catch the target tissue more precisely with the hook-shaped knife. So this is kind of rescue device for us.

And forceps type knives, such as SB knife or clutch cutter, is very good for the unskilled endoscopist. I'm sorry saying so. But even for the Western doctor, you can control this device more easily. And you can catch the target tissue, like taking biopsy from somewhere.

But as I mentioned, the cutting process always becomes intermittent. And it takes a little bit longer procedure time to complete the procedure. Well, this is important technical tip to have successful ESD result.

We should keep appropriate distance from the target. And we should keep a good contact with the target the issue with the tip of that device. This is a very important technical tips for all the ESD procedure. Thank you very much for your kind attention.

[APPLAUSE]