

**SPEAKER:** The endoscopy world at Mount Sinai essentially starts with Jerry Wayne. And so Jerry has been-- [INAUDIBLE] talking last night-- here for 58 years. Very impressive, obviously. And Jerry is a world-renowned endoscopist, has a legacy in polypectomy that is second to none. So he is the absolutely appropriate and apt choice to start off the first annual Mount Sinai live endoscopy course. Jerry is going to talk to us today about defiant colon polyps. Jerry?

**JERRY WAYNE:** Thank you.

[APPLAUSE]

OK, we're going to talk about defiant polyps. Defiant polyps are polyps that have defied removal elsewhere. And they come to us with a legacy of difficulty and defying previous attempts at rejection. So we're going to talk about the hows, the dos, and don'ts. But first, we're going to talk about the dos.

I think that, in spite of the fact that we want to get into the whole idea of endoscopy and taking these things out, I think the most important thing is that you have to consider the patient. And you should talk to the patient about the goal of polypectomy, the risks involved.

Tell them that there's a risk of bleeding that runs about 1 out of 200 cases. Tell them about the risk of perforation, about 1 out of 1,000. And importantly, tell them about the need for follow-up examination.

You should tell them the need of follow-up examination upfront. If you tell them after you do the polypectomy that they have to come back, the patients think, oh, that doctor didn't do a good job, and he didn't take it all out, so he wants me to come back. But if you tell the patient beforehand that they need to come back, it's a way of informing the patient that a follow-up is very necessary.

You have to tell them about the possibility for surgery, at the time you do it, for a perforation, or later on when the pathology report comes back, and you should tell them about the alternatives to the procedure, such as just watch the polyp, or surgery.

The first thing you want to do is assess the polyp from malignancy. If it's a carcinoma, you shouldn't take it out. One of the best ways of assessing from malignancy is to look not only at the surface, but also look with narrowband imaging so you can see with the polyp looks like, and critically assess the vascular pattern, and try to determine, in your mind, whether this is a cancerous polyp or not.

I think one of the important things when you see the polyp itself and you're going to take it out is get the polyp in the right position. The right position, actually, is down here at the 6:00 o'clock position. It's difficult to take a polyp off if it's up here on the-- by 2:00 o'clock, almost impossible if it's on the left wall. So you have to get the polyp in the right position in order to take the polyp off.

And how do we do that? Here's the polyp that's in a bad position. Here's a defiant polyp. Someone took a look at it and decided right off that this couldn't come out. So I think you have to decide, should we do it? Almost all of these polyps that are benign can be taken off. So I think you have to see fluid in the submucosal tissue, try to take your pieces less than 2 centimeters.

So in order to get that polyp in the right position, you first have to straighten the scope, torque the scope around so the polyp is down towards 6:00 o'clock, and then make an injection. You can make an injection into the polyp. You really want to see the submucosal tissue around the polyp rise up.

So here, we're going to wait and see if the polyp raises up with injection. And there it is-- the polyp is raising up. You see fluid in the submucosal tissue back here. And then we can start to take it off in piecemeal fashion. Depends on the size of the polyp whether you're going to want to inject the entire polyp at one time or portions of it. So most of us inject one portion of a polyp, take it off, and then go for the rest of it.

I think it's very important to keep the snare flat on the wall. Watch this, the technique here, where the snare is flat on the wall. If you approach the polyp with the snare at an angle to the wall, you're not going to be able to take it off flush with the colon wall. So it's very important to keep the snare flat on the wall like this. So you need a stiff snare.

So it's very important that you use a stiff snare. Some snares you approach a polyp like this, you push on the polyp to encircle it, and the snare will raise up, and then you are at an angle to the polyp and make it very difficult to take off. So I like to go from one end to the other, gradually taking pieces off. And then, when you're finished with the polypectomy, I then burn the residual, whatever is left here, with the argon plasma coagulator.

And you can destroy remnants of polyp at edge, at the base, like over here, and be finished with the polypectomy. This polyp was taken off, and it was benign. There was no evidence of any residual polyp.

So how do we get the scope straight so that we can manipulate it in the right colon when it scope when a polyp-- when the scope looks like this in the colon, anything you do down here outside the patient is not going to make any difference to what the tip is doing because the motion that you're doing outside the anus is not going to be transmitted to the tip.

However, if you pull back, straighten out all the loops, now, if you move the scope in a torquing fashion to the right or to the left, the tip will do the same thing. So you really have to get the scope straight in order to effectively take off polyps.

So once you've had a conversation with the patient, you assess for malignancy, I think that you should elevate any sessile polyp greater than 1.5 centimeters in diameter. Anything that's sessile and fairly large, you should inject with fluid to make the endoscopic mucosal resection easier. And you should inject the portion furthest away from you first to raise it toward the scope unless it's a huge polyp.

So if it's a polyp of decent size, you can inject on the far side of it, raise the polyp up towards you, and make it easy to resect. But if you inject here, you may have the polyp on the far side of your injection solution and make it very difficult. And then you'll kick yourself in the pants for having done that.

So do keep the snare flat on the plane of the colon wall. After the snare is positioned around the polyp, aspirate air, because the polyp will actually jump into the snare. And why will the jump into the snare? It's because when we put the air, in we really inflate the colon and flatten the polyp out like this.

So if you take the air out, remember that air decreases the circumference of the colon and the longitudinal aspect of the colon. So if you take the air out, the circumference becomes smaller, but the polyp footprint doesn't change. So if it's 1/4 of the wall distended, it's going to be 1/4 of the wall when it's contracted. And because of that, since the polyp volume doesn't change, the polyp will actually raise up and be much higher and easier to ensnare if you take out the air once the snare has been placed around the polyp.

So I think that-- inject a lot of fluid. You should see the normal mucosa around the lesion fill up with fluid I like to start the removal at one edge of the polyp and progress over to the other side, re-inject with saline as needed, and try to keep your pieces less than 2 centimeters in diameter.

Don't-- these are the don'ts. Don't do it you really don't feel right about it. Any gastroenterologist should be able to take off almost any benign polyp. We used to have a rule that if the polyp is greater than 1/3 the circumference of the colon, crosses two interhaustral folds, you shouldn't take it off. But that's gone now.

Those were criteria that I first wrote a long time ago when we were first starting doing polypectomy. But now we can take off polyps that are 7 centimeters, that are circumferential. So we just have to take a look at it, assess it, and go ahead and do it.

Don't attempt a polyp that's in bad position. You have to change something-- abdominal pressure, dial controls. Don't hesitate to use a lot of fluid if you're going to make the-- do an anoscopic mucosal resection.

And above all, don't use the spot or the India ink to elevate a polyp. I've seen that so many times, that somebody has used spot to elevate a polyp. That's terrible, because spot is going to cause fibrosis in the submucosa, and then the second attempt of polypectomy will be impossible.

So use saline or some other fluid to elevate a polyp, but do not use spot for elevation. And if you're going to mark with spot, try to do it at least a centimeter or 2 centimeters distal to the polyp. If you always do it distal to the polyp, then, when the surgeon calls you and says, I can't find the polyp, tell him to look 2 centimeters proximal to your spot injection, and they'll find it there.

Oftentimes, we stick the spot-- we stick the needle in the wall, we inject spot, and you see the fluid just come dribbling out, and you don't make any submucosal bleb. And you can use the whole 10 ccs and never make a bleb.

So what I have found is very successful if you first make a saline bleb, and then you inject into the saline bleb, and you will always be able to make your injection into the right plane.

OK, don't begin an EMR unless everything you see, everything you need is going to be there. You need snares, clips, Roth basket, some sort of argon plasma coagulator, dye spray. You need all these things before you start.

And do not take a snare biopsy at the edge of a lesion. If you see a lesion, don't take a snare biopsy of it because you think that's going to give you a bigger piece, because then, when the subsequent person goes to try to take that polyp off, it may be almost impossible because that snare biopsy will cause a cicatricial reaction at the biopsy site and you won't be able to take the polyp off completely.

So another thing is, don't use electrocautery current unless gas exchange is complete in the entire colon. That is, if you take off a rectal polyp, and the patient comes back for your repeat examination, and you see a portion left in the rectum, do not take it off then, because if the colon isn't completely clean and clear of explosive gases, you may have an explosion. And it's happened before. You must have the colon clean beforehand.

So if you're going to just do a rectal polypectomy, make sure you at least go to this splenic flexure and exchange gases. And it's safer to use CO2 than room air. And we use CO2 here all the time.

Don't tap the pedal intermittently during polypectomy. A lot of people got used, a long time ago, to putting their foot on the electrocautery pedal and tapping intermittently. That doesn't do anything for you. Just, if you're going to take it off, stick your foot on it and push down until it's finished.

Now, how I do it. You want a stiff snare. You can try around and see what's out there, but-- and the instrument manufacturer will be glad to give you a variety of snares so you can try them. And I usually use a big snare for the first portion of polypectomy and then a smaller snare for the small pieces.

What kind of snare should you use? Hex, round, oval, D-shaped, they're all about the same-- just whatever you're used to. I prefer the oval snare, and that's the one I use.

What about the electrosurgical unit? You have to use a modern, feedback-controlled electrosurgical unit that gives you the right amount of current depending on tissue resistance. And these are all the modern solid state units that we have now.

You can use coagulation current, which I use-- pure coagulation current. You can use blended current, which is a mix of coagulation current and cutting current together, or you could use endocut, which is a little coagulation current, followed by a little cutting current, followed by coagulation current, followed by cutting current. So it's an intermittent application of two different kinds of current sequentially. A lot of people like endo cut. I prefer pure coagulation current because I like hemostasis.

There's all sorts of things. Remember that if you're going to use the ERBE unit, the first generation of unit we set at 25 watts. The second generation is at 40 watts. And Michael Bourke has written a recent article using 80 watts with soft coagulation to touch up the edges of a polypectomy site with the snare.

That is, instead of using APC-- where the probe costs \$150-- you can use the tip of the snare to fulgurate the edge of a polypectomy site, but you use-- you have to set it to 80 watts, effect four. And soft coagulation, not the fourth coagulation that we use for polypectomy.

OK, so the argon plasma coagulator, you can use it with a steady stream of argon, or you can use an intermittent stream. You can use the ball tip, a straight tip. I like the ball tip electrode because it allows you to touch the wall and not go through the wall.

The argon flow rate most people don't pay attention to the argon flow rate. But some people use a 2-liter flow rate, some 1-liter. But all you need is some argon around the site of electrocautery.

So you really need 0.8 liters per minute. If you use 2 liters per minute, remember, every minute that you stand on the foot switch, you're going to get 2 liters of gas in there, so you can really over-distend the colon. So you can get by very well with 0.8 liters per minute of gas.

What about the injectate? I use pure saline, just plain saline with a few drops of methylene blue to put a tint in it. It should look the color of Windex. And I think-- that's what I tell the assistants. I want some methylene blue in saline to make this injection, and it should look like Windex.

So they give it to me, and it looks like black, and I say, that's not Windex. So then they say, well, we can dilute it. And then they dilute it, and then it looks nice. So you don't need-- if it's really dark and you use pure methylene blue, it's so dark, if it spills out, you won't be able to see anything. So you all you need is the small coloration of just a few drops in saline.

So my assistant closes the snare upon request. Some doctors like to close the snare themselves as they use electrocautery. And I think it doesn't really make any difference. I prefer to have a well-trained assistant close the snare, and they know what to do.

When the fellows start, first off, they usually capture the polyp, they stand on the foot switch, and the nurse-- the well-trained nurse-- will close the snare long before the doctor says, close the snare. Because they're so concerned about the foot switch and the electrocautery, they don't tell the nurse to close the snare. So I think that better you should have a nice, well-trained assistant who knows how to do these things.

Try to remove all the lesion on the first attempt. I use APC to residual polyp left after piecemeal resection, as you saw on that first video. And a pedunculated polyp, I just do it. I don't use clips. I don't use loops. I don't use anything.

And if there's bleeding, you can deal with it afterward. But you should watch the base immediately after you resect a pedunculated polyp, because then is when-- that is where the bleeding is going to occur, and it can occur right away after polypectomy.

What about ESD? Everybody's concerned about ESD, where you make injections underneath the polyp, you dissect like this, like putting a spatula underneath the pancake, you go in the submucosal plain, and you resect the entire thing.

The learning curve is steep. It's difficult. EMR is quicker-- that is endoscopic mucosal resection, the way you saw me take that other polyp out. It does a good job in polyp removal. There's about a 10% chance you're going to have a recurrent polyp, but that's usually 95% of recurrences can be removed on the second examination polypectomy.

EMR is much safer, you don't tend to perforate, and EMR may need more sessions to complete, but my personal opinion is it has too many complications. It's a long procedure, difficult, and I don't think it's ever really going to become mainstream. All of us aren't going to be doing ESD. So EMR is quite sufficient for us.

OK, so especially EMR techniques is hybrid EMR. You can make that incision around with a knife and then take it off with a snare. You can use underwater EMR. Binmoeller does it, a few papers about it. I don't think it's worthwhile. It's tough to do, and it's just not going to become mainstream. Cap-assisted EMR-- a lot of people use caps, but if you're going to use caps with suction, you may suck the entire thing in.

So lastly, I just want you to see that this patient was sent for surgery. And that's a fairly good polyp. And something like this, we're in a retroflexion mode now, making injections here in retroflexion mode. See, the snare is flat on the wall. We make these-- we take it off in piecemeal fashion.

I'll show you, here's a little injection here at the edge. We take this off. There was a little bleeding, so we put a clip on it. And when we're finished, we take this big polyp off with the snare and then treat it with APC so we can take the whole thing off. This took about an hour to do that, the large polyp, by my friend and colleague, Dr. [INAUDIBLE] We were just in India together, and he spent eight hours doing an ESD-- eight hours. My goodness, that's a little bit too long for me.

OK, so I think that if you can reach it, if it looks benign, most of these can be removed. Discuss with the patient. Have everything you need. Remember that you need to get a follow-up, and you can do it if you try. Thank you.

[APPLAUSE]