

Transcript Details

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Understanding the Value of IJ Catheters in Vascular Access Procedures

Dr. Birnholz:

For hospitalized and critically ill patients, there are, arguably, no interventions more commonly utilized or more crucially needed than central vascular access procedures. The internal jugular vein represents one of the frequently used sites, but knowledge gaps around best practices, risk mitigation strategies, and device selection criteria for IJ procedures need to be addressed. These and other topics are going to be the focus here today.

This is Vascular Viewpoints on ReachMD. I'm Dr. Matt Birnholz, and joining me for this discussion is Dr. Andrew Little, an emergency medicine specialist at OhioHealth Doctors Hospital in Columbus, Ohio.

Dr. Little, welcome to the program!

Dr. Birnholz:

So, Dr. Little, welcome to the program.

Dr. Little:

Thank you so much for having me.

Dr. Birnholz:

Okay, so let's start off with a quick review of the internal jugular central venous line procedures, and where, or from whom, they are most commonly indicated. When do you generally favor this particular intervention from your practice standpoint?

Dr. Little:

So, from my perspective, patients who benefit from central venous lines, particularly in the internal jugular vein, are of course any patients who warrant central venous access who particularly have access to the neck. People that I try to pick the neck over say the thoracic cage with a subclavian or a femoral vein are people who have contraindications to such. So people that might require vascular access from an interventional cardiologist or a vascular surgeon for work on their femoral veins or lower aorta, and in people who have had chest trauma, we try to avoid using the subclavian artery approach.

Dr. Birnholz:

And on the flip side Dr. Little, what are your team's contraindications to selecting internal jugular procedures?

Dr. Little:

Patients who we want to avoid using the internal jugular vein are people who come in with c-collars on who have suffered traumatic injuries or maybe have anatomically short necks to begin with. Basically, they have shorter cervical spines, so they have shorter IJs to begin with.

So, there are certain patient populations that when we attempt to get an IJ, most commonly people with clotting disorders, that when we actually look under ultrasound, they might have clots in their internal jugular vein, or, again, patients that have anatomical variations.

Dr. Birnholz:

Dr. Little, from your own touchpoints with vascular access teams and procedural training, is there a lot of emphasis on specific best practices for IJ procedures? Or, is there some variation in how they're approached?

Dr. Little:

There are definitely some best practices. You know, people typically recommend using the right IJ over the left. Just from an anatomical bend of having to place a central line, it makes anatomical sense to place it straight into the superior vena cava rather than having to deal with the anatomical bend of going from the left to the right. But, otherwise, you know, there are some anatomical approaches, but typically, it's the right versus the left. Other things to think about, of course, are the musculature of the patient's neck – where is the sternocleidomastoid muscle in relation to the vessel, and then also, what is the vessel line related to the internal carotid?

Dr. Birnholz:

Perfect, and how does your own department and others involved in vascular access care then approach central venous line placements via the internal jugular vein? Are there special considerations or roles assigned between personnel just to ensure the best outcomes?

Dr. Little:

You know, working at an education site primarily and then also in the community, as physicians, especially nuclear emergency medicine physicians, these are our lines to place. Best practices are, of course, that when you do place a central line in the internal jugular vein that you know you do basic common practices – you do reverse Trendelenburg; you anatomically place the patient's head to the opposite side to maximize access to the vessel under the sternocleidomastoid muscle, and then you want to make sure that there's good cooperation with nursing staff to make sure the right supplies are available, and also with radiology so you can get an accurate x-ray immediately after placement.

Dr. Birnholz:

That's excellent, thank you. And looking into safety issues, Dr. Little, can you elaborate on some of the complications that can occur, or mistakes that vascular access care teams sometimes make when performing IJ line placements?

Dr. Little:

Yeah, I think it's important to remember there are a lot of complications in placing central lines. First and foremost, is infection. There are infection risks of using all central venous access points because you're taking a foreign substance and placing it into a patient's body through their skin, and even with good washing with chlorhexidine, may still be infected. Luckily, with the latest research, we have found that placement in the IJ, the subclavian, or the femoral have about the same infection rate. So, placing it in the IJ is still very, very safe from an infection standpoint, but it is something to think about.

Mechanical complications are important to think that when you add a guidewire and a dilator and a scalpel in a procedure where you're accessing somebody's neck, those can lead to multiple different variations to where you can have a mechanical complication with your line to where either it leads to line failure or to a large hematoma of the vessel to where you're no longer able to cannulate it.

The biggest issue is how long the IJ is. It is to go from where you place it on the neck into the chest. You do use a guide wire. That guidewire can inadvertently nick the vessel wall. You can, due to respirations of the patient or the severity of the illness of a patient, can have a collapsible IJ that leads to cannulation of the carotid artery

And then, of course, there are simple things like blood clots that due to that trauma, I mentioned, with the guidewire going as deep as it does, you may actually damage the vessel wall, where you get clotting, even lead to venous thrombosis of that vessel.

And then also, the bigger issue is that when we place these, there's a lot of material used to place one catheter into the neck. There's probably 40 or 50 pieces, most of which that come in the current kit don't get used and are there as accessory pieces. And those are typically extra needles, extra lines, extra caths, and extra syringes, that if we could figure out a way to get rid of that, it would lead to less resource waste.

Dr. Birnholz:

For those just tuning in, you're listening to Vascular Viewpoints on ReachMD. I'm Dr. Matt Birnholz, and today I'm speaking with Dr. Andrew Little about best practices in central venous access procedures.

Dr. Birnholz:

So, Dr. Little, staying on that topic of complications for a moment, what are some of the parameters that help you decide which tools and devices to use for each patient so improve safety and minimize these complication rates?

Dr. Little:

So, in terms of parameters, you know, there's always the idea of setting up the bed appropriately. Most procedures in emergency medicine, or medicine in general, setup saves you a lot of time and can decrease your complication rate, and so trying not to be rushed in placing these, make sure the patient is in the proper anatomical position, make sure that you as the provider are placing it – is it a good angle to where it can be easily placed, and then making sure your other tools are available. If you're using ultrasound, make sure it's on before you start. Make sure it's in the appropriate place to where you can in line of doing a procedure, see the ultrasound. And then, also, other ways you can minimize complication rates is minimizing the steps you use in the kit. when I place a central line using a traditional CVC kit, I only take out the parts of the kit that I need, so I do not inadvertently grab pieces that I don't. That way, I'm not poking myself with needles, poking the patient with needles, and increasing the risk of complications related to that line.

Dr. Birnholz:

And from your vantage point, have any updates or newly emerging approaches incorporated by your team improved the short or long-term care course for your patients?

Dr. Little:

The big one, I think, is removing the unnecessary portions of a kit to where now when myself or other members of my department place central lines, we specifically take out the parts of the kit that we need, and pull out the ones that we don't. We saw that dramatically decrease our needle-stick rate among providers to where we were not sticking ourselves, and also gets you a quicker procedure that was easier for the patient as well.

Dr. Birnholz:

Great, and just to put all of these best practices together with the idea of pursuing the right vascular access approach for the right patient at the right time, can you share any memorable instances in which this played out well and changed the way you practice?

Dr. Little:

I think there were a couple of instances in my clinical practice that have changed the way I place central lines. The first one, of course, is using ultrasound. Going from a blind anatomical approach to a live picture approach where you can have the ultrasound on the entire time to watch your needle go into the right vein, watch it cannulate, and then watch the central line be placed in the vein and not in the artery, and I think the other big one, of course, is the one that I mentioned before, which was minimizing the kit to where, again, you're not having extra pieces on the field or things that you're worried about what is that for, you can just place what you need in the kit.

And then I think just in general that the common practice of proper setup equals appropriate execution, and I've seen that play numerous times where inappropriate setup of actually where you position yourself within the patient in the name of time, or trying not to inconvenience ancillary staff in helping you move the patient around or get the appropriate resources can lead to dropping patient's lungs or, again, inappropriate placement within either the IJ or into the carotid artery. So, I think there's just common best practices are important to follow and to do every single time despite how busy you are or how sick the patient might be, to make sure you avoid some of those complications.

Dr. Birnholz:

Thank you for sharing those experiences, Dr. Little. But before we close, do you have any additional thoughts that we should keep in mind here?

Dr. Little:

I think it's just important that when you place a central line to know that this is a procedure that is fraught with mistakes from the idea that it's multistep, and I find that in medicine and specifically in procedures, the more steps we add to the process, the more complicated it becomes. So, if you can find ways to streamline your process to where, again, you're setting up appropriately for the right procedure at the right time.

Dr. Birnholz:

Well we've certainly covered a lot of ground in our discussion today, and I'd like to thank Dr. Andrew Little for joining me to help us understand best practices in central venous access with internal jugular line placements. Dr. Little, it was great having you on the program!

Dr. Little:

Thanks so much. I look forward to doing it again sometime soon.