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Central Line

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VOICE OVER:

Welcome to ASA Central Line, the official podcast series of the American Society of Anesthesiologists, edited by Dr. Adam Striker.

DR. ADAM STRIKER:

Welcome back. This is Central Line, and I'm your host and editor, Dr. Adam Striker. Today, I'm joined by Dr. Muhammad Rafique, professor of anesthesiology at Loyola University Medical Center in Chicago, and the guest editor of the ASA Monitor's July issue, which is all about airway management, which is today's topic. Dr. Rafique, welcome back to the show.

DR. MUHAMMAD RAFIQUE:

Thank you very much.

DR. STRIKER:

Well, airway management is something we all deal with regularly as anesthesiologists. Do you think that familiarity drives us to take for granted how essential it is. And remind us why this is such an essential topic for anesthesiologists?

DR. RAFIQUE:

Thank you very much, Dr. Striker. We, as humans, have the most important connection with the environment around us is our lungs and airway, because that is the way we breathe and get oxygen and that is how we stay alive and are able to perform all the functions. And I think anesthesiologists have this privilege managing airway day in, day out, both complex and simple ones, as their clinical practice. So we have the most exposure, ability and expertise to be able to manage it, whatever variety comes our way. And we probably take it for granted. But in reality, if you kind of deeply analyze it, it is really a unique skill which our specialty has.

DR. STRIKER:

You know, it's funny you talk about it that way because I think many anesthesiologists, including myself, have always felt that airway management is so much more than just the technical skill. There's so much more foundational concepts, so much more thought, integration, and really necessitating a lot of what we bring as physicians when it comes to the expertise in managing airways. Do you feel that oftentimes that airway management is distilled down, unfortunately, to just more of a technical aspect like mask ventilation or intubation?

DR. RAFIQUE:

I think we as a physicians, because it is it is something we are doing day in, day out. But actually, you're right. It is not just ventilating or just passing a tube technically into the trachea. It is a lot more. And every little detail that goes into it, which starts with planning, examining the patient, looking at the options, and deciding which technique is the best technique before we actually take the patient to the operating room and execute it, are all very, very conscious decisions which, because of the nature of our practice, we are performing subconsciously or unconsciously that okay, this is the patient coming to us and we look at it and we, because of our training and expertise, we know that what is going to work for us in that case.

DR. STRIKER:

Well, most of our listeners are going to know that the use of airway devices continues to evolve. But let's take this opportunity to step back just a bit and talk about the history of airway management. Let's just start where airway management started. As far as physicians are concerned.

DR. RAFIQUE:

If you look at the history, tracheostomy is one of the initial ways of air management. And as the history tells us, that probably Alexander the Great was the first person who performed first tracheostomy with his dagger on one of his soldiers who was suffocating from with his own blood from an injury and saved the patient. And along the history, there are other accounts of people performing a surgery on the neck to bypass the obstruction in the mouth and saving lives. But those are very few examples. And at the same time it is a very invasive technique.

With the passage of time people started performing tracheostomies realize that this is not the technique to go to. It has to be less invasive. It has to be less damaging. And the

first report of a tube through the mouth to bypass obstruction was by William McVay in Scotland, and he used his finger to guide it, to put that into the tube, into that trachea. And he actually learned this technique on cadavers, and then he later used this technique in clinical practice, and that happened back in 1800s.

Later in the United States, Joseph O'Dwyer was the physician who created a metal tube to bypass obstruction in babies who had diphtheria. And I think you could say that is the point when the endotracheal tube was born.

It is interesting that the first account of laryngoscope becomes from 1850s by somebody who was not a physician, but a music teacher who wanted to look at the larynx. And he performed it by arranging to mirrors in a way that he was able to look at the laryngoscope. And but the actual laryngoscope piece by the physicians was not very popular until almost 100 years later, in 1940 and 1950s, when Miller and Mac played, as we know today, were developed and came to the clinical practice.

DR. STRIKER:

Well, now let's go past where we are now and skip ahead to the future. Today, there's a plethora of devices and tools available to us for airway management as anesthesiologists. But we all know these things evolve. Where do you expect to see those innovations go in the future?

DR. RAFIQUE:

Well, it is anybody's imagination if you look backwards. You know that the first account was using your finger. And today we are using video laryngoscopy are flexible scopes to intubate the patient. And all this innovation and invention has happened because people, creative minds, keep thinking about it and they want to research and find new techniques, and then they perfect us. But there is no way to predict today of what would be the most commonly used or most trusted device to perform the intubation.

The wand or boujee used to be the go to device about 20 years ago, but today nobody looks for wand or boujee. Everybody looks for a video laryngoscope. In my practice, in my hospital, most commonly used devices slides as the first to go to device. And I can only imagine with the passage of time, somebody may come within more innovative design and more innovative device, which may be better than today's video. Laryngoscope. It is only the imagination to see what it could be tomorrow. It probably would be more video based. It could be some kind of chip-based device, which would enable us to look in the mouth and be able to perform the laryngoscope in to intubate the patient's.

DR. STRIKER:

One thing I wanted to ask to follow up on that is the pace of this change. You briefly outlined the history of airway management over the last almost 200 years, now 150 years. As technology continues to evolve quickly. Are you concerned about that pace of change and I guess how we're teaching young physicians to manage airways? Are we all keeping up with this change appropriately? You know, there's a lot of the physicians out there, myself included, who are used to doing things a certain way and feel more comfortable with certain things. How do you grapple with all of that? What is your opinion about the pace and how that ties into resident and young physician education?

DR. RAFIQUE:

You're right. That is a very valid concern. There are new devices coming out to practice every day. Not every physician is familiar with every device which is out in the market. At the same time that training physicians who do the very rigorous residency, they follow certain curriculums. And in US residency curriculum for every management constantly gets revised. And I believe the last revision of the airway management curriculum came out in 2019. And it emphasized on module based learning, which is basically going to be based by the learner itself, that when they follow those things and learn the anatomy, physiology and techniques and then later they can even practice those techniques in the format of apps on their phone. And in the latest guidelines, there was a recommendation of using objective checklists for learners to for the skills on the cadavers and in the simulation, and then later test the same skills in patient care.

I think the curriculum development is very dynamic. It is updated according to the needs and according to the technology which is evolving out there at pace with what is being invented. Still, there is always this, I would say bias. For every resident who trains, whatever device is most commonly used in a program, they become more familiar with that and they may always be kind of leaning towards using those devices instead of using new devices.

DR. STRIKER:

We'll have more questions for you, but let's take a quick safety minute break and we'll be right back.

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DR. DEBORAH SWINGLE:

Hi, this is Dr. Deborah Swingle, chair of the ASA Patient Safety Editorial Board. Perioperative hyperthermia continues to be a common occurrence, despite extensive knowledge of its ill effects and the common practice of warming patients during surgery. The amount of time a patient experiences hypothermia matters, work to prevent heat loss, reducing the percentage of time patients experience hypothermia and ensure the patient is normal. Thermic Upon arrival to the PACU, it's essential that all team members understand the importance of pre warming patients prior to entering the operating room and then actively warming during surgery. A team-based approach with the anesthesiologist who is responsible for ensuring patients remain normal thermic as the team later improves perioperative temperature management.

VOICE OVER:

For more information on patient safety visit asahq.org/patientsafety22.

DR. STRIKER:

Well, Dr. Rafique, the incidence of difficult airway in pediatric population is certainly lower than adults. But there are more frequent respiratory events, if you will, in children. And, can you talk about how pediatric airway management is similar and different than adult airway management?

DR. RAFIQUE:

So as anesthesiologists, we know that children and neonates have less reserve of oxygen because of their metabolic needs and their physiology. And for that reason, usually the desaturation or other events are more common around the airway management in children, although sometimes people think there may be children or little adults. But in reality, all the evaluation tools we have for the airway evaluation, they kind of become very useless in children. As an example, score, which we all look for objectively, is not possible in children. This is not described and up to certain age. Kids are not cooperative enough to give you any opportunity to evaluate the body score. And the same is true for titlemental distance and other things. Instead, there are other things which objectively you could use to evaluate the airway status for the children, like if they have, you would say like dysmorphic features are mid face abnormalities, macro glossier or microgonopia. These are the features which would be helpful to determine if the child is going to be easy to manage their way or if it is going to be challenging. And then certain dysmorphic features are usually related to certain syndromes. So information and knowledge about those dysmorphic features and their relationship to syndromes is also important. So I can easily say that airway evaluation in children is

very different as compared to airway evaluation in adults. And probably same is true for techniques which are used to integrate.

DR. STRIKER:

Dr. Rafique, many pediatric difficult airways are so unique that I feel like it's more akin to some real traumatic adult airways or some very unique adult circumstances. So because of that, I imagine it does really take a just a different thought process and planning.

DR. RAFIQUE:

Right. I agree with you.

DR. STRIKER:

I understand. Dr. Kalra suggests a new approach to pediatric patient position for airway management in one of this month's articles. Do you mind telling us a little bit about that too?

DR. RAFIQUE:

Yeah. So Dr. Kalra is a very thoughtful guy and he came up with this idea that positioning in the airway management is always followed by certain objective goals that you want the patient sniffing position, flexion at the neck, extension at the Atlanta joint and kind of align the axis and be able to put your best foot forward by aligning all these axes and having the patient in a certain position. But in pediatrics, traditional teaching has been, because just put a towel under the neck and probably that is most people do. But if you look at the pediatric population, they range from a day old to up to 18 years old. And out of those patients who are neonates, which are less than one month old, are these small children. In neonates, as you know that the head size is much bigger compared to the rest of the body and it gradually kind of catches up. And for all these stages of development, probably there are different measures which could be taken to align the axis the way we know in adults, which is sniffing position. And so he suggests that every time we are going to manage a child, we should also be doing the same kind of positioning where we are objectively trying to align those structures and get the best positioning.

He actually presented this approach in the form of a scientific model in 2017's ASA conference, and he recently did a pilot study and they published in the European Journal of Anesthesiology, and they plan to do a more formal study where everything is

done according to his thoughts. I think it is a very innovative and very objective way of approaching the airway management in pediatrics, and I'm very optimistic that probably his approach will add to the present thought process of how to manage airway in children and probably maintain the practice for most people.

DR. STRIKER:

The vast majority of airways, though, in pediatrics, are successful without too much trouble. So what's the outcome that they're looking at?

DR. RAFIQUE:

Yeah, that is true, that most people are very successful. But what he's trying to do is that when the learners are learning how to manage airway in pediatrics, instead of just going and hoping that they will get it, they position the patient objectively in the best possible way so that there is minimum difficulty. There is minimum risk of complications. There is minimum risk of trauma. And it is more a controlled environment where it is being done as compared to a haphazard, an individual likes and dislikes, individual skills. You're not depending on those, but you are actually objectively putting the patient in a certain position that it is easiest for anybody to be able to manage the airway.

DR. STRIKER:

Well, look forward to seeing that in the issue as well. But let's shift gears just a tiny bit. Let's talk about the ICU. What do we need to know about airway management outside of the OR and how is it different?

DR. RAFIQUE:

So in the ICU, tracheal intubation is the most commonly performed procedure. But at the same time, when you look at the outcomes, there is more desaturation, there is more complications around the airway management when it is being done in the ICU setting. And probably there are reasons for that, which some of them are patients. Some of them are related to the personal, some of them are related to the equipment, like ICU patients are sick. They may not have respiratory reserve. A lot of times it is emergent intubation. And a lot of times there is not enough time for the physician to evaluate the airway. And there's not enough time for the physicians to gather the correct information and gather the most appropriate equipment to perform the intubation. Also in the operating room, the support staff is very familiar with airway management equipment and techniques, and they are usually able to help at the same time. On the other hand, in the ICU, that may not be the case. They may not know much about event

management equipment or techniques or how they can help. So all those things and not all the issues have advanced management tools, although now more and more ICUs are paying attention to that and are acquiring those tools, but still there is a lot of work that needs to be done. I think now there is more thought being put into it and some ICUs and some some institutions are implementing a checklist type protocol where they they have a checklist. And before you start integrating somebody, these are the one, two, three, four, five things you need to have at hand. And these are the things you are going to use to approach it. So probably that is the way for future. But still, I think every management outside the operating room is still more riskier and needs improvement.

DR. STRIKER:

Well, there's also some differences in how we manage airways in the United States and how it's managed in Europe and other areas of the world. For the listeners, I'm sure most know in 1993 the ASA published the difficult airway algorithm that has been consistently revised by the society and other societies have their own guidelines. In fact, the latest ASA revision, 2022, were developed by an international task force consisting of members representing more than ten international societies, anesthesia and medical societies. So why the differences in approach is it seems like airway management should be a consistency across the globe.

DR. RAFIQUE:

You're very right. That is the most logical that it should be similar everywhere. But probably there are differences in the available equipment in different parts of the world. And also the guidelines which are developed, the ASA guidelines are very clear that they are telling you how to manage airway, which is difficult, either it is anticipated or unanticipated. But if you look at the difficult Airway Society's guidelines, which which is the British guidelines, which the last one came out in 2015, it only tells you about unanticipated and provides an algorithm for unanticipated difficult airway. At the same time, the ASA algorithm basically applies to all the patients who we are going to be trying to manage air with, but Difficult Airway Society, they have separate guidelines for trauma for pediatric ICU and obstetric airway management. So probably one difference lies in there that they have more than one guidelines as compared to, ASA provides only one framework and tries to make it fit for everybody. The second thing, as I kind of mentioned earlier, is the availability of equipment. In USA, we know that almost every anesthetized location is mandated to have five flexible scope intubation equipment available as a mandatory thing. But that probably is not true in Europe for unclear reasons. Probably it has to do something with the ability to purchase them, but I could be wrong.

DR. STRIKER:

Well, what do you think? What's your opinion on how the ASA approaches it with a one size trying to fit all difficult airway algorithm versus the other areas of the world that try to focus in on each subspecialty or practice, if you will.

DR. RAFIQUE:

So if we think about it, whenever there is a difficult database case and God forbid if it were unanticipated and patient is desaturating or hypoxic, that puts stress on everybody involved in the team. And it is very well known that whenever we are stressed we may not be able to think clearly or clearly. And in that case an algorithm, if we have it available, that helps to keep the plan going straight. And instead of people being able to perform the task which they probably are, have been performing, are able to perform if they were not stressed, makes it much more easy that if there is an algorithm which we are going to follow regardless of stress level. And probably the reason for ASA's one universal algorithm is that there is only one algorithm people need to learn and know and master and be able to manage airway everywhere. If there are more than one algorithms, the way Difficult Airway Society of some of the European and other international societies have, they could make it a little bit more challenging and difficult for the clinicians to know all those algorithms cold and be able to know which algorithm is going to be applied here and so forth.

DR. STRIKER:

Do you know how it's received in other areas of the world?

DR. RAFIQUE:

So if you look at the history, ASA was the first to come up with an algorithm and then all the societies followed it. Different societies take pride in their own algorithms, but probably almost everybody admits that these algorithms have one goal, and that is to have a secured airway without any complications and hypoxia and a safe patient. So from that standpoint, everybody wants to take care of the patient, but probably ASA algorithm is always respected out there, but some societies are proud of their own thought process and their own algorithm, and probably they have their circumstances and their available tools and equipment and training at hand, which justifies for them to have more than one algorithms.

DR. STRIKER:

Well, before I let you go, let's touch on the Monitor issue you've been involved with. What are some of the most salient takeaways and what would you like everyone to know?

DR. RAFIQUE:

Well, I would say that airway management is a domain of the anesthesiologist. And I say that because we are the ones who receive the most comprehensive training for airway management, and we are the ones who are dealing with the airway day in, day out, and all complexities and all varieties. I think there is constant innovation resulting in safer devices and techniques, and we need to keep innovating and we need to keep thinking to be able to keep going forward and devising more and more and safer airway management tools and techniques.

Another thing which I want to emphasize that the anesthesia residency management curriculum is a dynamic document and it keeps getting updated every few years and is able to keep pace with the needs and innovation. And I think the residents who are getting trained today are very much equipped to be able to use the newer technology and be able to provide safe clinical care to their patients.

DR. STRIKER:

Well, Dr. Rafique, thank you so much for your insight and thanks for joining us again on Central Line.

DR. RAFIQUE:

Thank you very much, Dr. Striker, for the opportunity and glad to be here.

DR. STRIKER:

And for everyone else, thanks for listening. Remember to visit asamonitor.org to read the articles Dr. Rafiq has referenced and also to see the entire issue. And please join us again soon for more Central Line. And please don't forget, we appreciate subscribers, followers and reviews. If you like the podcast, please tell a colleague and we will see you next time. Take care.

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