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00:00:00.076 --> 00:00:21.423 Announcer Funding for Yale Cancer Answers is provided by Smilow Cancer Hospital. Welcome to Yale Cancer Answers with the director of the Yale Cancer Center, Doctor Eric Winer. Yale Cancer Answers features conversations with oncologists and specialists who are on the forefront of the battle to fight cancer. Here's Doctor Winer.

00:00:21.500 --> 00:00:47.346 Eric Winer Tonight, we're going to speak with the chief of surgical oncology at Yale School of Medicine. And we're going to be talking about advances in surgery, particularly as it relates to the patient with cancer and cancer treatment. I think it's fair to say that there's been a lot of attention paid to medical treatments for cancer over the last decade.

00:00:47.423 --> 00:01:28.269 Eric Winer We've talked about immunotherapy. We've talked about other targeted therapies. And yet at the same time, surgery has been marching forward and evolving. And we're going to hear about some of those changes, which have had huge consequences and have led to huge improvements today. So without further ado, I want to introduce my guest, Doctor Kiran Turaga who is a Professor of surgery, the chief of the Division of Surgical Oncology and a one of the medical directors in our clinical trials office.

00:01:28.307 --> 00:01:31.269 Eric Winer So Kiran welcome. It's great to have you.

00:01:31.461 --> 00:01:33.500 Kiran Turaga Thank you. Eric. And thanks everyone.

00:01:33.692 --> 00:02:04.615 Eric Winer Maybe we could just start off with a few comments about the role surgery plays in cancer treatment. It used to be the only modality we had for surgery. Someone actually said to me that that they were in a chemotherapy waiting room 50 years ago. You know, as a volunteer helping patients. And I said, well, that's not really possible because we didn't really give chemotherapy 50 years ago.

00:02:04.692 --> 00:02:10.000 Eric Winer It was all surgery. So what role does surgery play?

00:02:10.076 --> 00:02:39.692 Kiran Turaga I think thanks for the question, Eric. And you know, as and you and I both know surgery plays actually a very important role in the management of solid tumor cancer. So I think just for the audience, when you're thinking about cancers broadly, we think of sort of hematological malignancies like the leukemias and lymphomas. And many of those cancers do not require surgery outside of sometimes maybe diagnosis and getting some lymph node biopsies or skin biopsies or things like that.

00:02:39.692 --> 00:03:02.538 Kiran Turaga But typically surgery is not an important curative treatment paradigm for those diseases. On the other hand, for solid tumors, surgery is actually played a very important role and continues to play that role. You know, right now in the US, it's estimated that 60% of all

cancer patients, solid and liquid malignancies will undergo some form of curative intent surgery.

00:03:02.538 --> 00:03:25.576 Kiran Turaga So I think surgery remains that. I think one of the very cool things about surgery is that it is a curative modality. So I think for a lot of solid tumor cancers, breast cancer, including a lot of GI cancers like the cancers I treat, sometimes surgery alone can be completely curative for patients. And so I think it remains an important modality.

00:03:25.576 --> 00:03:46.846 Kiran Turaga But I think increasingly we're all recognizing the multimodal ways of treating cancer patients. And I think how all our therapies, whether it's chemotherapy, immunotherapy, endocrine therapy or radiation are all integrated together to help give patients the best outcome.

00:03:47.000 --> 00:04:14.846 Eric Winer You know, and particularly for localized cancers, surgery is curative and often the only treatment that's needed. Yeah, of colon cancer. And when it's when it's localized. And although we often give additional therapy to breast cancer, surgery alone cures a very, very high percentage of people who have localized breast cancer. It's just that we can make it a little bit better with some other therapy.

00:04:15.076 --> 00:04:51.115 Eric Winer So it's very, very important. And oftentimes the surgeon is really the gatekeeper, the first person that that a patient sees. And you know, you mentioned solid tumors. And just to be clear for our audience, in case there's any confusion, solid tumors includes everything that isn't lymphoma and leukemia and multiple myeloma. So it's breast cancer, lung cancer, colon cancer and all of the other tumors that actually form lumps.

00:04:51.153 --> 00:05:27.576 Eric Winer Essentially, surgery has also evolved dramatically. And it's not, of course, just in cancer. It's across the board. Surgical surgical techniques have improved and is has improved. Let's talk a little bit. Maybe first talk about some of the improvements in stage that have led to surgery being less of a big deal than it was. And I realize you're not just but you stand next to them every day that you're in the Or so.

00:05:27.576 --> 00:05:29.576 Eric Winer Maybe you can talk about that.

00:05:29.730 --> 00:05:58.269 Kiran Turaga Yeah, I think that's actually an incredible point, because the only reason that many surgical therapies have gotten better is because of our close partnership with our anesthesiologists. I think anesthesia today is safer than it has ever been. In fact, when we're talking to patients and clinic will often tell them that the risk of something bad happening from anesthesia is less than the risk of getting hit by a car on the road.

00:05:58.500 --> 00:06:26.730 Kiran Turaga It's an incredibly safe modality. And now, even for patients with significant heart issues and lung issues and other medical comorbidities, we're able to get patients through anesthesia quite well. So I think anesthesia has been remarkable in terms of its safety and how it's advanced. I think the other thing that has also been a critical partner with a lot of us is in the management of the patient, especially as it relates to fluids.

00:06:26.807 --> 00:06:44.730 Kiran Turaga You know, in the past, we used to think surgeries, this big traumatic event, and we would have this big belief that patients would need a lot of fluids during surgery. And so patients could finish a large operation, like a long operation and come out with a ton of fluid on board. They would be swollen, their intestines wouldn't work.

00:06:44.730 --> 00:07:15.576 Kiran Turaga They wouldn't be able to eat or drink. And using this modality called erase or enhanced recovery after surgery, we give patients medications up front to block the pain pathways. We are very judicious in the use of fluids during surgery, and I think that has led to a dramatic improvement in patient experience after surgery. So, in fact, just as an example, when patients would have colon surgery before they would be in the hospital for about two weeks and now they go home three days later.

00:07:15.576 --> 00:07:20.576 Kiran Turaga And so I think a big advance has been how we manage patients around surgery.

00:07:20.576 --> 00:07:45.461 Eric Winer Well, and I've recently become aware as a non surgeon non-Indian at about the importance of pain control during the procedure itself. And, you know, naively perhaps, I have always thought, well, you're knocked out. What difference does it make if pain is controlled. But apparently it does make a difference.

00:07:45.538 --> 00:08:14.576 Kiran Turaga It does. And in fact quite significantly. So obviously, you know, just because you're having surgery or under anesthesia, which means you have no awareness of what is happening to you, your body still feels pain. So there's still that pain response. And if you don't get good pain control, it actually clearly delays recovery to the point where now a lot of patients will get either pain medicine like opioids during surgery, or cousins of aspirin called tordoff or anti-inflammatories.

00:08:14.576 --> 00:08:28.269 Kiran Turaga And sometimes patients who are having big abdominal surgeries will get epidural catheters, which are catheters that are placed in the back that can give low doses of pain medicine while patients are undergoing surgery.

00:08:28.500 --> 00:08:48.000 Eric Winer Let's talk about some of the changes in surgery. And we've got a few minutes left in this half, and we're going to continue this into the next half of the show. But what do people mean when they talk about minimally invasive surgery?

00:08:48.038 --> 00:09:12.730 Kiran Turaga Yeah, I think, you know, if you think about the evolution of surgery, you know, all the way back to maybe third century, fourth century Greece, where patients would have tumors removed when they were awake, no anesthesia. And then anesthesia evolved in 1800s where still tumors were removed. And when Austrian surgeons did big gastric surgery or Halsted, one of the famous surgeons at Hopkins did big breast surgery.

00:09:12.769 --> 00:09:43.538 Kiran Turaga They were incredibly mutilating procedures for patients. And and their recovery was was dramatic. The field of

surgery has since evolved. And I think the big evolution of surgery it's actually interesting. It's happened on the on the edges. So one we're doing less surgery and we're doing it less painfully faster, more efficiently with tools such as robots or laparoscopy or or techniques and technologies that make it less invasive for patients.

00:09:43.576 --> 00:09:46.576 Eric Winer And we'll get into robots more a little later.

00:09:46.615 --> 00:10:29.807 Kiran Turaga Yeah. And I think, on the other hand, we've also now, because of the advances in anesthesia, gotten to the place where we can now do even bigger surgeries that we could ever consider before, like transplants of multiple organs or, you know, big tumors that are being resected while patients are on complete venous bypass or cardiopulmonary bypass. And so I think the evolution of surgery has happened on both of the edges where we are operating in a less invasive, faster recovery, smaller incisions for patients, but then also our ability to do bigger and bigger procedures for tumors that are or larger or require more complex work.

00:10:29.884 --> 00:11:10.653 Eric Winer The other thing that's happened. Of course, is that it's not just medical oncologist and radiation oncologist who have conducted very important randomized clinical trials defining new standards, because, of course, as a doctor, you could do something and conclude that it's the better way of doing it. But that's not very scientific because we shouldn't practice according to it. The last, best or worst anecdote you should practice according to wealth and safe studies, and surgeons have been very involved in conducting studies where they compare two different surgical approaches.

00:11:10.730 --> 00:11:34.846 Kiran Turaga Yeah, I think I wish it was more you know, I think, you know, the, the, the patients, the difference between us and, say, someone who's a quack or someone who is practicing medicine empirically is the fact that our medicine should and must be grounded in evidence, which means we have proof that this is going to help the patient in front of us.

00:11:34.846 --> 00:11:58.038 Kiran Turaga And I think that is sort of the key factor that defines us as doctors. And that's what actually builds trust for patients in us. And we're not just recommending random therapies. Now, there's a big difference in the way the pharma industry has evolved and the device industry has evolved, which is the key backbone of surgery in pharma industry.

00:11:58.038 --> 00:12:26.346 Kiran Turaga The FDA requires every new cancer drug to undergo strict clinical trials to be considered safe. And so therefore, there's innumerable clinical trials for the new drugs. Pharma. And you've seen a lot of new advances in the Raas therapies and obviously hurt new therapies and all these sort of biologic and immune agents that are coming through. But I think when you think of devices, devices are actually often adopted without that same burden or need for evidence.

00:12:26.346 --> 00:12:44.423 Kiran Turaga And it's just safety. That's usually what brings devices into the market. And so you suddenly have proliferation of technologies which sometimes are not grounded in evidence. And I think that's why it's a huge deal for surgeons to be involved and to drive many of these clinical trials.

00:12:44.461 --> 00:12:52.653 Eric Winer And why did that happen? That there was this divergence between drugs and devices? Because devices. Of course, are very important.

00:12:52.730 --> 00:13:23.346 Kiran Turaga There are and I think that and I'm not an expert on this. So I wouldn't, you know, say this, but my opinion is that, you know, we innovate on a daily basis in surgery. And so often we're replacing one thing with another or one ablative technology with another ablative technology. And I think perhaps in its intention, the FDA was trying to make this easier for patients to have access to these, you know, perceived good therapies that are safe.

00:13:23.346 --> 00:13:46.153 Kiran Turaga But I think, you know, a classic example is like the robot for cancer surgery, which I know we're going to talk about. But, you know, it's a great tool. It helps surgeons see very well. So intuitively it makes sense that we should use it for patients. And we feel like we can do the same operations. But when this was tested in a randomized trial for cervical cancer, which is a common cancer across the world.

00:13:46.192 --> 00:14:08.846 Kiran Turaga It was found to be inferior. Actually, women had worse outcomes when they had robotic cervical cancer surgery than than when you think about it. So I think but unfortunately, the burden of proof doesn't lie with the device company anymore. And so the likelihood of them funding a large clinical trial to test its efficacy becomes less. And so that's that's a big challenge we face.

00:14:09.153 --> 00:14:24.346 Eric Winer Well, we're going to need to take just a brief break. We'll be back in a minute. Again I'm here with my guest, Doctor Kiran Turaga, who is the chief of the Division of Surgical Oncology at Yale School of Medicine.

00:14:24.423 --> 00:14:43.500 Announcer Funding for Yale Cancer Answers comes from Smilow Cancer Hospital, where artificial intelligence works together with the latest imaging technology to help diagnose cancers at earlier stages and treat them more effectively. Learn more at SmilowCancerHospital.org.

00:14:43.576 --> 00:15:14.192 Announcer There are over 16.9 million cancer survivors in the US and over 240,000 here in Connecticut. Completing treatment for cancer is a very exciting milestone, but cancer and its treatment can be a life changing experience. The return to normal activities and relationships may be difficult, and cancer survivors may face other long term side effects of cancer, including heart problems, osteoporosis, fertility issues, and an increased risk of second cancers.

00:15:14.230 --> 00:15:43.307 Announcer Resources for cancer survivors are available at federally designated comprehensive cancer centers, such as the Yale Cancer Center and at Smilow Cancer Hospital, to keep cancer survivors well and focused on healthy living. The Smilow Cancer Hospital Survivorship Clinic focuses on providing guidance and direction to empower survivors to take steps to maximize their health, quality of life, and longevity. More information is available at YaleCancerCenter. org.

00:15:43.346 --> 00:15:46.576 Announcer You're listening to Connecticut Public Radio.

00:15:46.653 --> 00:16:13.038 Eric Winer Welcome back to the second half of Yale Cancer Answers. Again, this is Eric Winer, your host. And I'm here with Doctor Kiran Turaga, who is a professor of surgery at Yale School of Medicine and a cancer surgeon. So I had promised that we would talk about robots. But first, maybe we could talk about minimally invasive surgery and robotic surgery.

00:16:13.038 --> 00:16:15.884 Eric Winer Are they the same thing or they different things?

00:16:16.038 --> 00:16:40.653 Kiran Turaga I think in concept they're the same thing. And so minimally invasive surgery implies that we make smaller incisions essentially the size of your pinky, to actually enter a body cavity, whether it's the chest, the abdomen, and even sometimes for cutaneous. So which means skin stuff. So even breast surgery being done through small incisions. And so that is typically the premise of minimally invasive surgery.

00:16:40.884 --> 00:16:45.346 Kiran Turaga The innovation of minimally invasive surgery happens with development.

00:16:45.423 --> 00:16:50.269 Eric Winer For example, with an abdominal surgery that's often done through a person's belly button.

00:16:50.384 --> 00:17:20.307 Kiran Turaga Belly button, and a few poke holes here and there. That's called laparoscopic surgery. And in fact, some of the earliest laparoscopic surgeries were done by gynecologists that were trying to assess the endometrial and looking at the ovaries. And that has then since evolved, where surgeons took it on to do gallbladder surgeries. And and that same technology now allows us to do lung cancer surgery or kidney cancer surgery or stomach cancer surgery or colon cancer surgeries and prostate surgery.

00:17:20.307 --> 00:17:44.346 Kiran Turaga So I think that minimally invasive surgery was that premise of where we started using these smaller incisions. Now, the trade off was that the small incisions required long instruments, and we would blow up the cavity with either air in the abdomen or in the chest. We'd kind of create this visualization where we have a small camera. You can see everything and work, but the instruments are very stiff and straight.

00:17:44.346 --> 00:18:08.076 Kiran Turaga And so it required incredible amount of dexterity that we as surgeons had to adopt to, to do these complex procedures.

And you couldn't suture and crevices and corners and, and so that's where the robotic technology developed, where now you have this instrument that can take a essentially a surgeon sits at a console. So it's not like an autonomous robot doing surgery, but it's a surgeon sitting at a console.

00:18:08.076 --> 00:18:31.192 Kiran Turaga And this instrument essentially translates their actions into these fine motions. And you can actually scale down, scale up depending on your on your hands and things like that. That then allows these instruments with what we call wristed action. So it has like an ability to turn and then it can suture in small spaces. And what it does for patients is essentially you have smaller incisions.

00:18:31.192 --> 00:18:56.846 Kiran Turaga You get the same quality surgery generally with great visualization. And so this is great because surgeons can see well, the assistants can see well. Everyone can see well. What is the latest though Eric. And this is mind blowing in the era of AI, which is now that all of this video can be continuously analyzed and you can actually give feedback to surgeons on where this may be dangerous or not dangerous.

00:18:57.000 --> 00:19:23.461 Kiran Turaga So there's a lot of AI based optimization that's occurring in this space. And in fact, Johns Hopkins recently reported on a on a pig that underwent a completely autonomous surgery where the robot was shown a bunch of videos, it was trained on it with AI algorithms. And then essentially, the robot completely performed the surgery in a pig without any human supervision, which is.

00:19:23.500 --> 00:19:26.576 Eric Winer A like a this is like a totally self-driving car.

00:19:26.615 --> 00:19:51.192 Kiran Turaga It's exactly like a self-driving car. And the other crazy thing is that there's actually been a robot that's been used in in on a spaceship at the ES with the surgeon sitting in California. So I think that is also crazy to imagine that now, because of the data speed transmissions, you can actually transmit these signals even across space and continents.

00:19:51.346 --> 00:19:56.038 Eric Winer Do you think so? Is it going to be out of business?

00:19:56.076 --> 00:20:22.461 Kiran Turaga Not not right now. I think, you know, the the human body is is incredibly complex. And I think for someone like me and, you know, surgeons that have been doing this for many years, every day poses a slightly different challenge, a slightly different body. And I think while many tasks could be automated or repeated or kind of put down there, the unfortunately we have a lot of scenarios where the edges are the most important.

00:20:22.653 --> 00:20:45.000 Kiran Turaga Something's not right, something's different. You've got to be able to react real time. And I think right now I don't think we have any trusted systems where we would say autonomous performance of these tasks are safe or trustworthy or, you know, it will have any better outcomes than right now what what human surgeons do.

00:20:45.076 --> 00:20:54.615 Eric Winer So what kind of training is involved to to learn how to use these robots? Because it doesn't seem easy to me.

00:20:54.692 --> 00:21:28.269 Kiran Turaga It actually surprisingly is intuitive. So as an anecdote, you know, if you think about surgeons who adopted this other technology called laparoscopic surgery, a lot of older or more experienced surgeons actually didn't adopt laparoscopic surgery because they felt it was too difficult and required a very steep learning curve. The robot, on the other hand, is actually so intuitive because it's essentially moving your hands and fingers in a very natural way that you would use to move your instruments to suture and things like that.

00:21:28.269 --> 00:21:51.153 Kiran Turaga And so, remarkably, when the robot was introduced, a lot of older surgeons actually quickly adopted the robot because it was great for posture, it was great for, you know, being able to use these things. And it was very intuitive. But the training, of course, as you can imagine, is long. So we do medical school for four years and then there's residency for five.

00:21:51.192 --> 00:22:16.461 Kiran Turaga But usually if you really want to be a good cancer surgeon, you have to at least spend 2 to 3 years doing research. So that's about seven years of residency. And then it's about 2 to 3 years of fellowship. And even after fellowship, even though you are a board of or a board certified surgeon or surgical oncologist, you still take, I think, at least five years before you can hit your prime of doing good, complex robotic surgery.

00:22:16.461 --> 00:22:32.153 Kiran Turaga So, I mean, we're talking at least a decade plus of training. That is before you do the robot. And so once you're trained in doing surgical techniques, then I think the robot right now is just like a tool that you would adopt, like any of the other tools we use during surgery.

00:22:32.192 --> 00:23:03.615 Eric Winer Yeah. No, I mean, I think people often don't realize that the typical age of a young surgeon who is really starting their surgical practice as a full fledged attending physician is somewhere between the ages of 35 and 40 because it's a long, long period. And if someone stopped along the way to get a PhD in addition to an M.D., which is true of many of our researchers, it's even it's even older.

00:23:03.692 --> 00:23:38.230 Eric Winer No, it's it's it's really a lot of of of training. Maybe we could touch on how the interaction is with medical oncology and radiation and radiation oncology, that is, and how that impacts the kind of surgery you do. So I mean, I will just let it my own area in breast cancer, there are now many patients we give medical therapies or drugs to.

00:23:38.269 --> 00:23:47.307 Eric Winer First. The cancer sometimes goes away entirely, leading to much smaller surgical procedures.

00:23:47.346 --> 00:24:19.730 Kiran Turaga I mean, I think you know this, you know, and you've seen this, Eric, and I'm certainly in your role as the president of Asco. I'm sure you have led a lot of these efforts to. But, you know, this

is and I say this and my wife usually always corrects me. But I think this is an exciting time for cancer therapies and cancer research because, you know we are seeing the potential of therapies leading to curative, noninvasive therapies leading to curative outcomes for patients.

00:24:19.769 --> 00:24:45.269 Kiran Turaga You know, there is immunotherapies that are saving patients big rectal cancer surgery, gastric cancer surgery, soft surgery. I think breast surgery is a great example of where we're doing less and less and less. You know, in the past it used to be biggest operations and taking out everything, and now it's even less because sometimes therapies that are being given to women before their cancer surgery, as you said, are leading to what we call complete responses.

00:24:45.269 --> 00:25:09.076 Kiran Turaga So the cancers are disappearing and they're actually not coming back either. So I think it's a it's a very exciting time for all of us. You know, as a cancer surgeon, you know, our motto is to reach a state where we don't have to do surgery anymore. It's kind of crazy. It's this it's this belief that we want to put ourselves out of business, because ultimately, that's what's the best thing for patients and outcomes.

00:25:09.153 --> 00:25:39.115 Kiran Turaga And and I think, you know, it's so important to have a team where the medical oncologist, the radiation oncologist and the surgeons and of course, our entire teams are nurses and pathologists and everyone else are are single mindedly focused on the disease, on the cancer, specialized and thinking about that patient to give them the best outcome. So I think the partnership cannot be underscored, whether on the national front, research wise or locally at an institution and a cancer center.

00:25:39.192 --> 00:26:11.846 Eric Winer No, that partnership is absolutely critical. And oftentimes breast surgeons and breast medical ecologists, you know, are closer colleagues than that medical oncologist, maybe with another medical ecologist. And patients are able to perceive when teams work and when they don't and when they work, everyone can can really almost finish the other sentences. And when they don't, it's just not good.

00:26:11.846 --> 00:26:15.884 Eric Winer And the patient doesn't feel good about it.

00:26:16.038 --> 00:26:41.153 Kiran Turaga Yeah. And I think it makes each of us better because I think everyone is an expert in their in their trade, in their sort of, you know, practice. But I think when you interact on a regular basis and dynamically and of course get along well with each other, I think it makes it better not just for the patient of today, but also the patient of tomorrow, because then you're thinking about how do you actually improve things as well.

00:26:41.230 --> 00:26:46.730 Eric Winer And speaking of tomorrow as we wait and where are we going?

00:26:46.769 --> 00:27:09.500 Kiran Turaga I think number one, we're going to be much better at identifying patients that benefit from surgical therapies,

whether minimally invasive or small or maximally invasive, or we're doing these major operations. The second, I think as a community, we're going to get start getting more focused on the what we call the right side of the curve on the curative intent.

00:27:09.538 --> 00:27:33.000 Kiran Turaga You know, I think now we have to hold all ourselves to higher standards of, you know, the four week improvement and survival or the, you know, surgery that leads to three months of longer life, but it does not improve quality of life. I think we have to be very, very rigorous in saying, is this really providing durable, meaningful benefit to patients?

00:27:33.000 --> 00:27:53.615 Kiran Turaga I think that is the most important thing, and I think we will all get better in doing this. And then ultimately, you know, of course, I'd love a world where, you know, we're doing a little bit more of what we call prophylactic surgery. There's these very interesting gene mutation phenotypes where we're taking care of them before patients develop cancer.

00:27:53.615 --> 00:28:12.653 Kiran Turaga And I think that is a very interesting space, I think pioneered in the breast space, but also now being done in gastric cancer and and other cancer types, pancreas cancer, where we're operating on patients before they even develop cancer. And I think that has the highest potential for long term cure for for many patients.

00:28:12.884 --> 00:28:38.423 Eric Winer I think those are very hopeful messages. I also think they're realistic messages. Want to thank you for being here tonight again. My guest has been Doctor Kiran Turaga, chief of surgical oncology at Yale School of Medicine, a cancer surgeon, professor of surgery at Yale School of Medicine as well.

00:28:38.500 --> 00:28:57.576 Announcer If you have questions, the address is CancerAnswers@Yale.edu and past editions of the program are available in audio and written form at Yale Cancer Center.org. We hope you'll join us next time to learn more about the fight against cancer funding for Yale Cancer answers is provided by Smilow Cancer Hospital.