PATIENT POWER

Northwestern Memorial Hospital

Stroke Prevention with Carotid Surgery or Stenting

Webcast

September 22, 2009

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Introduction

Andrew Schorr:
Carotid artery disease can lead to stroke, which is the third leading cause of death in the United States. It's a major cause of disability. Coming up, Dr. Mark Eskandari will discuss the diagnosis and treatment options for carotid artery disease that can reduce your risk of complications from this life-threatening and debilitating condition.

Hello and welcome to Patient Power sponsored by Northwestern Memorial Hospital. I'm Andrew Schorr. When you think about a health condition that is all too prevalent in the United States, stroke is right up there at the top of the list, and that's where all too many people have a cut-off of the blood flow to some part of their brain. It is, I think, the biggest cause of disability in the United States, and all too often it is a cause of death.

So what do we do about it? How do we limit your risk? What are the warning signs? How do you attack it? Are there pills you can take? Are there surgical procedures, and which type of surgical procedures? We're going to help you understand all of that, and hopefully help you live a long life with a much lowered risk of a having a fatal or debilitating stroke.

To help us with that discussion is Dr. Mark Eskandari. He's a vascular surgeon at Northwestern. He's an associate professor, and he's really one of the leaders, one of the pioneers, really, as they develop new techniques, particularly minimally invasive techniques, related to helping with carotid artery disease. Dr. Eskandari, thank you so much for being with us on Patient Power.

Dr. Eskandari:
Glad to be here.

Andrew Schorr:
Dr. Eskandari, let's start with strokes. So I described it as a cut-off of some blood flow to the brain. So is it that these arteries, like the two carotid arteries going up along the neck, when we have cholesterol and plaque, is it kind of like a pipe that gets rust in it and it gets rough on the inside, and then there's something that could break off and cut off the blood flow? Is that the way it works?

Dr. Eskandari:
Yeah, I think it's important to think about stroke in two main categories. There are those strokes that are related to blood flow problems, which are the ones that we'll talk about today, and then there's also blood flow problems related to bleeding in the brain tissue itself. But a stroke really is just when part of the brain tissue dies or is damaged because of inadequate supply of oxygen and nutrients.

Andrew Schorr:
So with those of us who maybe in America unfortunately don't have the healthiest of lifestyle, or we have a family history of stroke or high blood pressure, so what's happening inside those arteries? When you look at them, what do you see?

Dr. Eskandari:
Well, the inside of the artery, normally what we would expect to see is very smooth. It almost looks like a plate glass window when you look at it. When it becomes diseased or atherosclerosis forms in there it becomes very irregular and bumpy, and it gets cracks and irregularity there. And when I talk to patients in the office frequently I tell them it almost looks like a cobblestone road. So there's the potential that not only does the artery start to get plugged up but some of the debris that accumulates there can break off, travel in the circulation and lodge in some of the smaller blood vessels inside the brain.

Risk Factors and Symptoms

Andrew Schorr:
Now, what increases our risk of stroke? Certainly America has an eating problem, so we have obesity. And we have a diabetes problem, big time along with that.

Dr. Eskandari:
Sure.

Andrew Schorr:
We have hopefully fewer people who are smoking. I keep saying I'm trying to get the President to quit smoking, but there are a lot of people who are former smokers. Help us understand the risk factors and family history too.

Dr. Eskandari:
So the primary risk factors are the same things that are risk factors for atherosclerosis or hardening of the arteries in other parts of the body. So that includes risk factors such as aging, smoking, high cholesterol, high blood pressure, and diabetes. Those are the primary risk factors. And you try to change as many of those things as you can so that you can slow that progression of the atherosclerosis or the hardening of the artery in those different parts of the body.

Andrew Schorr:
So if someone tries to make a change, so lowering their cholesterol, lowering their blood pressure, doing exercise, quitting smoking, is that all to the good?

Dr. Eskandari:
Yes, absolutely, and not just in the carotid arteries but in the arteries of the heart or in legs as well.

Andrew Schorr:
Now, what about family history? So if you had your mom or dad who had a stroke, maybe died from it, then are you at higher risk?

Dr. Eskandari:
There is some information in the medical literature that suggests that there is some family predisposition, but the data on that is less clear than it is for other types of vascular disease. It's primarily the risk factors that we just reviewed.

Andrew Schorr:
Let's talk about the symptoms. So what would be the symptoms of a stroke?

Dr. Eskandari:
So stroke symptoms come in really three different forms. There are the ones that are true stroke that I think many of us in the public are aware of. There are symptoms of a mini stroke. And then the last one are something called silent strokes that your physician may tell you about. So let's review them.

So a stroke is when you get symptoms such as loss of function in your arm or leg where it just goes limp. It doesn't do what you want it to do. It's difficult with your speech, so inability to get the words out that you're trying to get out. And then the other thing is loss of vision in your eye. So it's usually complete loss of vision of one of your eyes, almost as if somebody put a patch over your eye. So it's not the blurred vision or halos or spots, or even dizzy spells, but complete loss of vision.

If those symptoms last for a few minutes and then come back, that's what we call a TIA or mini stroke, TIA meaning transient ischemic attack. If the symptoms persist beyond that point, then those are what's called a stroke, and that means part of the brain tissue has died and that's what has caused those symptoms.

The last one are the silent strokes. So if you go to see your physician and they do a CT scan or an MRI they may say that at some point in the past you may have had a stroke because they see damage to the brain tissue on those imaging tests even if you don't have symptoms.

Andrew Schorr:
Now, what about just one side of the body? So if I'm talking to my wife, and suddenly she's saying, well, you're slurring your words, I'm having trouble moving one side of my lips, is that a clear sign?

Dr. Eskandari:
Yes. So that's what's one of the unique features about a stroke is that it typically will involve one side of the body and not the other side of the body.

Andrew Schorr:
All right. So if somebody has any of these signs, what do you do?

Dr. Eskandari:
You should go to the emergency room, the nearest emergency room right away and have your physician in the emergency room evaluate you and try to figure out what the source of the problems were and start the appropriate medication to try to correct where the abnormality is.

Andrew Schorr:
Dr. Eskandari, though, some people might have this and then it goes away, and nobody wants to think the worst. I'm not saying we want to put our head in the sand, but there are a lot of other health things where your body kind of takes care of it. This is not one of them. So if you have one of these TIAs, these mini strokes, is that a wake-up call or is it something you can just go on about your life?

Dr. Eskandari:
No, it's absolutely a warning sign. And all of us are guilty, even physicians are guilty of sort of ignoring things and saying that it will get better, especially if it's gotten better on its own. But if you have any of those symptoms, that is something that requires some prompt medical attention and evaluation.

Evaluation and Testing

Andrew Schorr:
All right. What does that evaluation consist of? So let's say you go to the emergency room, you're a little embarrassed because now you're not feeling the symptoms, or maybe there are some that are persisting, what will typically be done to try to see what's going on?

Dr. Eskandari:
Most of the evaluation in the emergency room include noninvasive testing, so tests that don't require any major procedures of any sort. And those usually include a CT scan or a CAT scan to look at the brain tissue. Sometimes we'll also do a MRI or a magnetic resonance imaging study to look at the brain tissue. And then if we're concerned about the circulation in the arteries in the neck or the carotid arteries, the best way to evaluate that frequently is just an ultrasound test, known as a doppler.

Andrew Schorr:
Tell me about further tests. So I understand sometimes you'd inject dye. What might happen if there's more suspected?

Dr. Eskandari:
So the medical technology has gotten so good now that the evaluation of the carotid circulation is usually done first and foremost with an ultrasound test, and that provides quite a bit of information. It allows us to see how rapidly the blood is

flowing through the carotid artery, and the more rapid the blood flow the more severe the narrowing. We have charts that correlate how rapid that blood flow is and a range of the narrowing of the artery.

In addition the ultrasound test allows us actually to look at the carotid artery, the inside of the carotid artery, the same way that you do with an ultrasound test for obstetrics when you're looking at a child that's in the uterus. If that test gives us the suspicion that you are in a range where the carotid artery is very narrow, then subsequent studies include either an MRA, which is similar to an MRI, or a CT scan. Rarely do we have to do catheterizations or angiograms unless we're proceeding with some other form of therapy.

Treatment for Stroke

Andrew Schorr:
All right. You get the results, and then you say, okay, what are we going to do about it. Let's understand what the range of treatments are. First of all, somebody would like to say, well, I'm going to change my lifestyle or are there pills I could take that maybe would lower my risk of a stroke. So tell us about that first.

Dr. Eskandari:
Well, what's nice is because of the way medicine has progressed there are a number of clinical trials where we try to answer these particular types of questions. And many of these trials are conducted in the United States, some are done overseas, but it's a large number of patients that have been analyzed appropriately without any corporate influence on the data analysis to help us derive a guideline. So these are the guidelines that the American Heart Association puts forth that all of us follow in the community.

What those guidelines say is that you stratify patients into two categories: those individuals that have symptoms of a stroke or a mini stroke, and those patients without symptoms. So in patients who have symptoms, usually the recommendation is that if you have a 50 percent narrowing of the artery or more then something other than a medication or risk factor modification is required. But if it's less than 50 percent, then medical therapy or risk factor modification is beneficial.

In patients without symptoms, the guidelines are that for otherwise healthy individuals if you have a 60 percent or more narrowing or sometimes even 80 percent or more narrowing, then the recommendation is something more than medical therapy alone.

So what's medical therapy? I think that's obviously the common question that people would have.

Andrew Schorr:
Right.

Dr. Eskandari:
And I think the important factors are the things we talked about in regard to risk factors. So medical therapy would include exercise therapy, for people who are smokers some form of therapy to try to get them to discontinue smoking. Patients with elevated cholesterol as measured in their blood can be reduced with a number of medications including the classification of statin medications. And then we also recommend an antiplatelet therapy, and that usually is an aspirin or Plavix. Platelets are some things that circulate in the blood circulation that are responsible for forming clots.

Andrew Schorr:
So someone might take those pills if they're in that class that you talked about, but then other people have more narrowing, and you're going to talk about other interventions. Help us understand those.

Surgical Treatments

Dr. Eskandari:
So there really are two forms of therapy for those individuals who require more than just medication. Up until about ten years ago the only form of therapy for the carotid artery was surgery, and that's known as a carotid endarterectomy. And in a very simplified manner, what it entails is an operation with an incision in the neck that's about five inches, four or five inches in length, and then through that incision we clean out or remove the plaque in that carotid artery. That operation has some risk associated with it which we can review, but basically the outcomes from this operation are very good. Most people are in the hospital for just a day.

The alternative therapy that has become available in the last ten years or so is stenting. The as stents are placed in the arteries of the heart, stents can also be placed in the carotid arteries in a very similar manner. And both of these procedures have very good outcomes from the data we look at now. Both procedures do have a risk of stroke associated with it. The risk of stroke varies depending on a variety of factors but in general are in the range of about two to five percent. They also just require an overnight stay in the hospital.

Andrew Schorr:
Let's go through these in greater detail. So the endarterectomy is an open surgery and under general anesthesia.

Dr. Eskandari:
It's typically under general anesthesia, but sometimes it can be done under a local anesthetic or an axillary block. So basically the patient would be awake but would not feel any of the operation that's going on in the neck. But the vast majority are done under a general anesthesia.

Andrew Schorr:
All right. And you're in the hospital about how long after that?

Dr. Eskandari:
Most places and most patients, you're in the hospital for one day. The operation takes roughly two to three hours. After you wake up from the anesthetic, you spend a few hours in the recovery room, you go to a regular room after that. You have dinner later in the evening. And then most people by the time they go home, which is the next day, it's light duty activity for about a week or two, so you need a little time off work. No special medications after the operation, and all the sutures are underneath the incision so they get absorbed on their own.

Andrew Schorr:
All right. Let's talk about stenting. I think people have heard about this a lot related to the heart. Is it a newer procedure, and I know you've been involved in developing devices for it. Help us understand, when you do a stenting procedure what are you doing, and how do you decide which procedure is right, that you'd recommend for a patient?

Dr. Eskandari:
So the stenting is newer in some regards. It really required the development of devices that were specifically designed for this form of treatment and for these arteries. It is done very similarly to a cardiac catheterization. So what we actually do is we numb up an area in the groin, just at the top of the leg. We numb up the area in the groin and put a catheter inside the artery in that region. The reason we do it from there is it's far easier to do it and more comfortable for patients to do it down in the groin than to put a catheter or a needle in the artery up in the neck. Then using an x-ray machine we thread a catheter all the way up to the area where the narrowing is in the neck.

And one of the things that's really been fascinating and really exciting I think for carotid stenting is the development of these special devices called embolic protection systems, which are essentially umbrellas that have little holes in them, so they filter the blood. So it gets a little bit technical, but basically we go beyond the area of narrowing in the carotid artery and then open up this little umbrella that has holes so that it filters the blood. And then through these catheters and using the x-ray machine we crush the plaque with a balloon, then we place a stent inside the artery so that we prop open the artery, and then anything that may get broken off during that time gets trapped by that umbrella that we've put up above instead of going up to the brain.

Then we take everything out. The only thing that remains when we're finished with the procedure is the stent. The stent is not a drug coated stent. It's just a very flexible, metallic stent, and the procedure takes about two hours. The recovery is very similar to a regular operation. It's an overnight stay in the hospital. The only difference is you need to be on Plavix in addition to aspirin, and Plavix is just a stronger antiplatelet medication. You take that for about a month after the procedure.

Andrew Schorr:
We received an e-mail question, and we always invite our listeners to send an e-mail question. Any time, you can always contact us and send us a question. Here's one we got from Jeff in Chicago. He said his doctor suggested that he have a stenting procedure to prevent stroke. He's a little worried about complications down the road. You were talking a little bit about the recovery, and he wondered is there any rehabilitation. And he wonders, will the stent last forever, or will it have to be replaced.

Dr. Eskandari:
That's a great question. As we talked about before with carotid surgery, there were a number of trials that were done in the 80s and 90s to answer the question of when surgery is recommended versus just medical therapy itself. There are ongoing trials now to answer the question of when is stenting beneficial compared to carotid surgery or medical therapy. And some of those trials have been completed and they've given us some guidelines, but we're still waiting on some additional data.

The big concern with carotid stenting is that, unlike the surgery where you remove the plaque, with carotid stenting you leave the plaque there and you crush it, and then you put the stent in there. Initially the big concern was that the durability or the ability of that artery to stay open after you do the procedure would not be very good, that the artery would get blocked up in a very high percentage of patients a year or two years later. As it turn out, though, if you look at the data that's published both from our own institution and then in other places around the world, the incidence of that artery getting plugged back up is actually very, very low, and it's comparable to the same type of numbers we see for people who have regular carotid surgery. So it's about a two to five percent incidence of that artery becoming narrow again.

Andrew Schorr:
And it was really cool, you were describing that umbrella, so you mentioned about the risk of having a stroke when you have one of these procedures, even the endarterectomy. So that umbrella is designed so that there can't be that complication or lower the risk of that complication during the stenting procedure.

Dr. Eskandari:
Correct.

Andrew Schorr:
Okay. That's so cool. So the maturation of the technology is really just amazing, and the reliability seems to have come a long way too. So let's talk about how at Northwestern you make a determination with a patient which procedure is right for them. When would it be ruled out based on maybe their overall health or when is it really a better choice for them?

Dr. Eskandari:
I think the guidelines that we follow now are the patient is evaluated for either surgery or stenting. The factors that sort of lead us to do one or the other are a number of things. So for instance somebody who has had prior surgery on their neck for a carotid operation and the artery has narrowed again, patients who have had radiation to their neck for a head and neck malignancy, individuals that have a tracheostomy or a permanent tube in their neck, or individuals that can't tolerate a general anesthetic to be asleep for the operation, if they have underlying heart disease or pulmonary disease or they have difficulty breathing, those are individuals that may actually do better with the stenting. And the reason is that those are cases where the procedure is done under local anesthetic, no incision is made in the neck. You don't have to worry about any of the wound healing or breathing or blood pressure problems by doing that approach.

The other thing that is important, though, is that those imaging studies we talked about at the very beginning, the MRA and the CT scan, allow us to see what the anatomy looks like. And although when we're first born all of our arteries are nice and straight and there's some minor bends and things like that in the circulation, as you get older the arteries start to have more curvature to them. And if there's a lot of angles or bending or narrowing of the artery, particularly up in the carotid circulation, sometimes those are cases where I'll defer doing carotid stenting because of trying to negotiate all those turns and recommend regular surgery.

The most important thing now is insurance coverage for the procedure. Obviously you don't want to go through the procedure and then get stuck with paying the bill out of pocket. And so the way that things are covered right now is that carotid surgery is covered by all health insurance companies and Medicare. Carotid stenting is only covered in select cases, and those are individuals that meet specific criteria that Medicare puts forth, which in a nutshell are that you have symptoms and a severe narrowing of the carotid artery and you have an underlying medical condition that precludes doing the operation or if you are an individual who is interested in carotid stenting but are willing to be part of one of the trials that use devices that are already approved for that particular use.

Research and Clinical Trials

Andrew Schorr:
Now, you have a research center at Northwestern and you're a researcher yourself. Tell us about the trials.

Dr. Eskandari:
There's a variety of trials but probably the most important ones to be aware of is ones that are called randomized trials. So a randomized trial means that I as a physician present all this information to a patient, explain the different forms of therapy, make a recommendation of either doing the surgery or the stenting, but then as a patient you need to meet with a clinical research nurse that explains to you what the trials is. There's a form that's roughly five pages that explains to you

what the trial is, what are the risks and the benefits in participating in the trial and what your alternative forms of therapy are. And after reading that if you as a patient are interested in the trial you sign a permission form. Information is submitted to a computer. The computer is anonymous, looks at the information and randomly selects what form of therapy you as a patient will have, whether it's the surgery or the stenting. So you ultimately don't get to make the final decision about what type of therapy you'll get.

Andrew Schorr:
Dr. Eskandari, so people often think, well, newer is better, but here's a case where there are limits on the newer stuff and the sold older tried-and-true continues to be what maybe is most popular. Help us understand that because a lot of people say, well, the stent stuff seems miniature and less invasive, I want that. Why is there the resistance or maybe any hesitation? Is it simply cost?

Dr. Eskandari:
I think cost is part of it. The other part of it is we really want to make sure this is a good option for patients, that the outcomes are just as good as we see with the surgery. I think that many physicians are convinced that you get very good outcomes with the stenting compared to surgery for patients who have symptomatic carotid disease with a number of other medical conditions such as heart disease or lung disease. I think that many physicians are convinced that stenting works very well for people who have had previous surgery or radiation to the neck.

But the vast majority of patients that we see and treat are otherwise healthy individuals without symptoms, and the narrowing was detected by their physician on just routine surveillance or examination in the office. So the real question is what are the outcomes in that sub group of patients. And hopefully within the next month or so we'll have some additional information to tell us whether the outcomes are just as good, and these require randomized studies with thousands of patients to really answer that question.

Andrew Schorr:
Now, if someone has the need of a stent in their carotid artery, let's say one carotid artery, and I believe you have two, right? What's the likelihood you're going to need some procedure in another artery or even elsewhere in your body?

Dr. Eskandari:
So that's a very common question, and there have been a number of people that have actually studied this. It turns out that roughly a third of patients will require subsequent treatment of the carotid artery on the other side. So if they had treatment on one side over their lifetime there's about a third or a 20 to 30 percent chance that you'll require treatment on the other side. The reason it's relatively low is that because you've identified that there's a problem in circulation, you've

changed some of those risk factors that we talked about in the beginning, and by changing those risk factors you've slowed the progression of atherosclerosis and therefore the likelihood of needing treatment on the other side.

Andrew Schorr:
I want to get some help from you in underscoring something. So again we talked earlier about people might have one of these mini strokes, and they want to just go on with their life. We had a question from Kevin in Gary, Indiana who said, what is the recommended treatment following a TIA, and does having a TIA increase of risk of having a bigger stroke? And it does, doesn't it? And it's like do not pass go. You should get checked, right?

Dr. Eskandari:
Absolutely. So when we talked about the randomized trials, the trials that were conducted in the 80s showed that the incidence of having a subsequent stroke is very high in individuals that have a mini stroke. And the recommendation by the American Heart Association is that if you do indeed have a mini stroke that you should have appropriate treatment of that mini stroke within about two weeks of its first onset. So it's not a lot of time to work with.

Andrew Schorr:
Now, how much do these symptoms vary? Like, first of all, you said there's some situations where you don't have any symptoms, but if you have a little wake-up call is it very variable where it could be, but it couldn't be, people are embarrassed to get checked, you know, maybe it's not classic. How much does it vary?

Dr. Eskandari:
It doesn't vary all that much. Sometimes you may go to the emergency room because of an episode of dizziness or blurred vision or something like that, and those are really not symptoms of a stroke or a mini stroke. I think many people that have these symptoms of a stroke or mini stroke will in fact go to the emergency room because the symptoms are pretty profound. I mean, if you lose all function in your arm on one side or the other and you can't move it, that usually will alarm patients enough that they'll go to see somebody in a hospital.

Andrew Schorr:
Let's talk about whether all hospitals are equal. I know you are very proud at Northwestern that somebody can be evaluated for a stroke really quickly. Where someone goes when it's an emergency may matter, right? Because isn't the saying Time is Brain?

Dr. Eskandari:
Exactly. In fact there are a number of hospitals around the country that are designated as stroke centers, because although our conversation today has been mostly on carotid disease there are a number of other things that can also lead to stroke and there other types of therapies that are available for people that have a stroke. So having these designated stroke centers which are multidisciplinary,

which means it involves a surgeon, a radiologist, a neurologist, and whole cohort of people is really important in treating those patients properly.

Andrew Schorr:
Okay. Well, I urge people to think about where are the stroke centers near you. Northwestern is certainly one, and it's something people should consider.

Dr. Eskandari, so any final point you'd care to make when people may be candidates for these procedures or at least evaluation that you want to underscore for folks today?

Dr. Eskandari:
Well, I think the primary things to just review are the risk factors for carotid disease are aging, smoking, high cholesterol, high blood pressure, diabetes. Correction of those factors will help carotid disease but also circulation of the heart and the legs.

Number two is that treatment includes surgery, stenting and medical therapy.

Number three, if you're unclear as to what is the appropriate form of therapy then seek a second opinion.

Andrew Schorr:
All good advice. Dr. Mark Eskandari, vascular surgeon and really a leader in the range of surgical procedures for vascular problems like a narrowing in the carotid arteries. Thank you so much for being with us today on Patient Power.

Dr. Eskandari:
Thank you.

Andrew Schorr:
This is what we do on Patient Power. I'm so appreciative of Northwestern Memorial Hospital for being a sponsor over so many years. I want to thank people for going to the recordings and the transcripts of our programs. So many of you have been making use of it. There's a whole range of topics that we've covered and other programs related to stroke as well, so be sure to take a look

On our next program we'll be visiting with Dr. Greg Petersen, and we'll be talking about stress management. That's good advice for all of us. Thank you so much for joining us on Patient Power. I'm Andrew Schorr. Remember, knowledge can be the best medicine of all.