

## Surgical Therapy for Lung Cancer (Video Transcript)

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Featuring:

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Welcome to Lung Cancer Awareness Month and the University of Chicago's presentations on lung cancer. Today we're focusing on treatment for lung cancer and that will include surgical therapy, radiation therapy, and chemotherapy and a combination of all three of those. I'll talk a little bit about surgical therapy, and my name is Mark Ferguson. I'm one of the thoracic surgeons here, and I've been at the institution here for 23 years, so I know a little bit about how things work and a little bit about that cancer problem.

Well, for those of you who haven't attended any of the previous sessions or read any other handout material, this is what we're faced with here in terms of lung cancer in the United States. You can see the rate per 100,000 population for males and females in red, on this – and this goes from the early 1970s to the late 1990s. So it's a substantial problem. In terms of frequency of occurrence, it's sort of in the ballpark of colon cancer and breast cancer.

You can see in the blue line that men are much more commonly infected than women, although the relative frequency of occurrence in men has decreased in the last decade or so. Perhaps due to some of the anti-smoking efforts that you've seen. But the equality of women seems to be making itself known, and so they're rapidly catching up, and it's expected that the relative frequency in women isn't going to level off for another 5-10 years.

The most recent data we have are from 2005. We're expecting over 170,000 new lung cancers during that year. And most of those patients will die of their cancer. So the efforts that we're making as some of you heard in the previous sessions, are to achieve earlier diagnoses. You'll hear today about what some of our current therapies are and then the final session this month, you'll hear about some of the new exciting prospects that we have for managing lung cancer.

This talks a little bit about the impact of lung cancer on the U.S. population. You can see that it's by far the most common cause of cancer death in men, and for the last almost a decade now, the most common cause of cancer death among women as well.

In men, lung cancer deaths exceed the next three most common cancer types put together. And in women, lung cancer exceeds the next two most common cancer types. So it's quite an important problem.

Now, why should someone consider surgery as a treatment for their lung cancer? There are a number of different reasons. One is that we've been using surgery for lung cancer successfully for more than 60 years. For early stage cancers of the non-small cell cancer variety, this is clearly the best current treatment that we have and it may also benefit some patients who have relatively advanced cancer. Not widely metastatic cancer, but what we call regionally advanced cancer. Cancer that's still contained within the chest cavity, where it originally developed.

There are a number of reasons why people don't have surgery, and some of it has to do with misunderstandings about what surgery can accomplish and what some of the potential problems are that result from surgery. One that I hear a lot--I would say at least once a week--is that if you expose a tumor to the air, that is by opening the chest up, that it will spread. And that's clearly a myth. But if you quiz people who come into the medical center here, 40% of them will say that they believe that this is the case. And in certain populations, at least 20% of people refuse surgery just because of this concern. That they think the cancer will spread.

Some people believe that it's a very risky operation and it's true that if we offered this sort of thing to everybody who had an early stage lung cancer, yes, the risks could be high in certain segments of that population. But we do a lot of testing before surgery, and a lot of thinking about who should and who should not have surgery in order to, as best we can, reduce the risks of surgery to the bare minimum.

The incision can be painful immediately after the operation. I would say perhaps 95 or more percent of patients, long term after surgery, this is several months later and then, up to decades later, have little or no pain as a result of their operation and are quite happy with their quality of life.

And this is another important issue, the overall quality of life, that is perceived by patients who've had major surgery for their lung cancer. In general, if you ask someone who's had lung surgery, how they would rate their quality of life, it comes within a percentage or two of the typical person on the street, who has never had any lung surgery. So it's actually quite good.

Now, there are a lot of people who have lung cancer, who are not candidates for an operation. Let's talk for a minute about who, which patients may be a candidate for surgery. In general, we're operating on patients who have non-small cell lung cancer, so surgery usually is not recommended for patients who have small cell cancer. And 95 or higher percent of those patients with small cell cancer, the cancer has spread to such an extent that surgery is not really feasible for that. So we're focusing on patients who have non-small cell lung cancer, which makes up about 80, almost 80% of the patients overall with lung cancer.

These patients, also generally speaking, have early stage cancer. Now in some countries, such as Great Britain, only about 10-15% of patients with lung cancer ever go to have an operation. That's probably too small a percentage, given the stage at which these patients are diagnosed. In this country it's closer to about 20-25% of patients. So the main reason that patients don't get referred for surgery is because of advanced stage of their lung cancer.

Patients must have adequate lung function. In general, we're removing at least 20% of the functioning lung tissue when we do a standard operation for lung cancer. So the patients must have sufficient lung function, both to get through the operation and also to enjoy an appropriate quality of life, once they have recovered from the surgery.

We screen the patients for problems like coronary artery disease, valvular heart disease, previous strokes, kidney function, things of that sort, to make sure that there are no important medical problems that would prevent patients from having a safe operation.

Now, this is a typical patient who's had surgery within the last month here. She's 80 years old, so advanced age by itself is not a contraindication to having a successful operation. You can see this spot, and what is her right lung and the lower half of her right lung, measures about 2cm in diameter. This is a very typical peripheral early stage lung cancer that we think is quite amenable to

successful surgical therapy.

Now what happens when someone is going to have an operation for lung cancer? Well first, they're evaluated in the outpatient clinic. And we do a careful history, physical examination, review all the studies that are done, and order whatever additional studies are necessary, so that we can make a very specific recommendation to that patient about the appropriate initial therapy.

If it turns out to be surgery, then those patients are seen again in the surgery clinic for a very detailed discussion about their operation. They see an anesthesiologist on that same day, who talks to them about going to sleep and waking up from the anesthetic, pain management options for the operation and for long term. Most of the patients come into the hospital on the same day as the operation. So they go to a pre-op area, and then directly to the operation room. They then undergo a general anesthetic, and then we do an evaluation of the patient prior to removing any lung tissue. So first we do what's called a bronchoscopy. That's a look down the windpipe with a flexible telescope, so that we can make sure there is no unsuspected abnormalities in the airways that might prevent us from doing a successful operation. Our approach to the lung tissue is usually done through the side of the chest, between the ribs, and traditionally this has been a fairly long incision, a foot or more in length, cutting through many of the muscle layers. Over the last decade or so, we've reduced that down to about a 4cm – 4" long incision and recently, we and other people as well, have been doing this using, what's called thoracoscopy, so minimally invasive approach, like some people have for getting their gallbladders removed. And that's proven to be much less painful than the standard, even mini thoracotomy operation, but the same operation is done regardless of which approach is used.

Most of the patients will go to the intensive care unit directly from the operating room, and stay there for close observation for one night, and then go out to a regular room on the floor and typically patients are discharged within 4-6 days of the operation. Now the entire recovery period, of course, is longer than this. It's probably in the range of 6-8 weeks, until they're feeling close to – or back to 100%.

Now just to illustrate very briefly, what the operation entails. The objective of the operation is to remove the lung tissue that contains the cancer and for an early stage cancer, most of the time we'll do, what is called a lobectomy. So on the right lung, there are three lobes; the upper lobe, middle lobe and lower lobe here. And in the left lung there are two lobes. The anatomy is specific to each lobe of the lung. So that you can see the windpipe here, going into the right lung, and taking off into the upper lobe and then splitting into the middle lobe, and the lower lobe. Similarly, on the left side, the main windpipe here splitting off into the upper lobe and the lower lobe. It's our job to dissect out the appropriate portion of the windpipe so that we can take out that individual lobe of the lung, without disturbing any of the other lung tissue.

That's made a little complex, because there is the artery coming from the heart, wrapping in and around these airways, and each individual branch of the artery to the lobe in question needs to be controlled. And there are also veins that are interspersed between these branches of the arteries and branches of the airways. So having some knowledge of the anatomy here, I think goes a long way to making a successful operation.

This is an example. We've cut some of the tissues right in front of the blood vessels at the root of the lung and have dissected out the segment of the vein that drains from the upper lobe of the right lung. You can see that the instrument has been passed around that vein and then a stapler is passed across the vein and once that's fired, that staples rows on either side of the cut line, so that the vessel is both divided and sealed at the same time. You can see the ends of the cut vessel here now.

And then we're going behind that vein and dissecting out individual branches of the artery to the upper lobe, and those are then individually divided and simultaneously stapled like this. Once

we've divided the vessel branches, then we just have to divide the airway to the specific lobe and then that can be removed.

Now after the operation, this is the same patient in question on the day of her operation. You can see there are a couple of drainage tubes in the right chest, and these help to drain fluid and any air leaking from the surface of the lung into a container that sits outside of the patient. And those tubes stay in and drain that area until they can be safely removed, once the air leak has stopped and once drainage decreases from the lung.

Now the short term results are good, and it's largely because we're very careful on how we select patients. So you can see fairly low instances of things like heart attack, infections and death as a result of the operation. There is an ongoing problem with respiratory complications, congestion or even pneumonia. And this is because the patients have substantially reduced breathing capacity immediately after the operation, and most of these patients already have fairly severe emphysema as a result of their smoking, which has led to their developing lung cancer.

I mentioned the usual hospital stay is 4-6 days, and the return to activity is a month and a half or two. Now long term, we're able to select patients so the vast majority of them do not require oxygen at home. The vast majority of them are very comfortable so the incision doesn't bother them. Most of them are returning to a normal lifestyle. This is a disease of older patients. Many of them have already been retired prior to their operation, so defining what's normal for them is a little bit problematic. The vast majority of patients would clearly do it all over again, if they had to make that same decision again.

This is just general background on how stage of lung cancer determines what the long-term outcomes are. So we're following patients from the left to the right on this graph from the time of their diagnosis which is at zero years, to five years after their treatment. And you can see that the top three or four lines are early stage cancers. Stages 1 and 2, and the outcomes for those patients are what we consider to be fairly good. So on average, Stage 1A lung cancer patient should survive five years, about 75-80% of the time. And those are the people that we focus on as candidates for surgery. Patients who have Stage 1 or 2 lung cancer. The patients we like to avoid, because surgery offers only risks and no benefits, are those bottom three, two or three categories. So Stages 3B and 4B in particular.

So let me just summarize before we move on to our next speaker. We think surgery is very appropriate in some patients with lung cancer and selection of those patients is very important. We think it's the best therapy for patients with the earliest stages of cancer, because the short-term results in terms of complications and patient satisfaction are very favorable, and because the long-term results in early stage patients are really quite good.

So that's all I have to say about surgery. I'll be happy to answer any questions if any of you would like to clarify anything.

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