Managing Malignant Pleural Effusions: Pleurodesis

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TRANSCRIPT & FIGURES
So we're talking today about pleural fluid, the fluid that builds up around the lung – fluid that causes people to be short of breath, often have symptoms like cough, or even chest pressure. The management strategy that I’m going to talk to you about right now, regarding the management of pleural fluid, is called pleurodesis. It’s probably the oldest technique out there for managing pleural fluid.

Now, the anatomy of the pleural space is that there are two linings of the lung: the lining that’s the parietal pleura around the chest, and the visceral pleura that’s around the lung – or you can think about it as going to the grocery store and getting your groceries in a double plastic bag, and having two plastic bags, and having fluid between those. Pleurodesis is the action of taking those two bags, or linings, and searing them together so that you no longer have two plastic bags – you actually have one fused space. So if the action of pleural fluid is to develop, shrink the size of the lung, and make you feel short of breath, pleurodesing the pleural space eliminates the space for pleural fluid to go and allows you to live with a lung that is maximally expanded.

Now let's talk about some critical issues that are associated with this. Number one, in order for pleurodesis to be effective, the lung has to fully expand. Now, the lung, when the fluid is drained, should come down just like an inflated balloon, and fill that whole cavity, and the two linings should be touching. If that doesn’t happen, for several reasons – whether the lining of the lung is too thick, like an orange peel and it can’t expand, or there’s septations or bands within the pleura that doesn’t allow the lung to expand, then pleurodesis is not going to be effective. Because remember, what we’re
doing is we’re obliterating the space for pleural fluid to develop. If we only partially obliterate, then we can have pockets of fluid develop, so we need to be able to allow the lung to expand in order for pleurodesis to occur.

The next thing I think is really important for people to understand is that pleurodesis, in the literature, is effective about 85% of the time. So, about 15% of the time, searing the two linings of the lung together is not going to be effective, even in the most optimal circumstances when the lung expands, and you may have to have an alternative procedure to chronically manage the pleural fluid.

So how do we go about doing this pleurodesis technique? There are two traditional techniques that have been described for doing pleurodesis. One is surgical – a surgeon takes a small camera, places it between your ribs, and into that pleural space, the pleural fluid is drained, the lung is allowed to expand, and then the surgeon will instill a chemical in there that allows the pleural fluid to stick. What are the most common chemicals that are used? The most common chemical, and the standard of care today for pleurodesis of the lung, is talcum powder. In the United States, we should be using less than 5 grams of talcum powder, and this is an amount that will coat the surface of the lung, create a sticky and inflammatory space, and allow that to sear together. There are other chemicals, and you may hear of people talking about them; they may include Betadine, they may include D50 – which is a very sticky, sugary solution – you may hear of people using doxycycline, but the most common one that’s out there is talcum powder.
If it’s not going to be inserted with surgery, an alternative way to insert it is with a catheter tube. Catheter tubes can be called chest tubes, or pigtail catheters, or small drains. These are all placed, again, into the pleural space. We need to drain the fluid, have it dry, have the lung expand, and then the irritating agent, the talcum powder or other agent, is instilled through that catheter, into the pleural space. That irritant is allowed to sit there as you breathe – your lung is moving and sliding and creating this irritation, and that will create a permanent sealing of those two structures together. How long does it take for this to occur? On average, you should expect a hospital length of stay of around three to four days. During that time, a tube will be draining the fluid so that those two surfaces can be stuck together, hoping for a permanent stick.

Things that you can expect to experience – oftentimes, people experience a fever, and oftentimes people will experience pain. Now, we don’t enjoy giving people pain, but we do hope that this inflammatory process, while it’s sticking, is creating a lot of activity, and that activity can cause the fever and the pain. So, make sure that when you talk with your physician and the nurses, that you’re not afraid to ask for pain medications. What we ask is that you don’t use anti-inflammatories, like ibuprofen or steroids, because these may inhibit the ability of the two lung surfaces to stick together.

But if this is successful, it liberates you from any interventions from your ER doctors, your pulmonologist, your medical oncologist, from having to deal with that fluid around that lung, and those two surfaces will stick together. Patients do very well with these two surfaces stuck together, and lead very normal lives, and it shouldn’t have a long-term impact on you.
So this is another alternative for managing fluid that recurs around the lung. The times that you should think about this is when you have pleural fluid, the pleural fluid causes you symptoms and shortness of breath, and when that pleural fluid is drained, those symptoms go away, and you go back to an active life. And the fourth unique criteria is that, when that fluid is drained, the lung has to be able to completely inflate, and those two surfaces have to stick together in order for pleurodesis to be effective.