Discussion to: The process and safety of removing chest tubes 4 to 12 hours after robotic pulmonary lobectomy and segmentectomy

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Presenter: Dr Mohamed El Zaeedi

Dr Matthew Blum (Colorado Springs, Colo). You went through some of those slides pretty quickly, so I’m not sure if everybody could catch everything. There are some details in the manuscript that were not in the presentation, but perioperative management of these minimally invasive patients was at a time when we were performing thoracotomy, so a lot of the postoperative or perioperative care issues haven’t been specifically nailed down, and it’s nice to go after this with the chest tubes in particular.

The chest tubes are drains that have a number of downsides, so if we can remove them earlier, then that’s helpful. This report details the results of implementing a specific, supposedly reproducible protocol, so it’s helpful if you can give us the details of that. Most people worry about taking out chest tubes early because they’re going to have an occult air leak or they just have a small air leak that they didn’t recognize, and maybe these pleural drainage systems help with that or they’re going to develop effusions afterward. When you looked at the data, this was supposedly a protocol-driven early chest tube removal thing, but if you had this increase over time, what happened over that time period that allowed you to take those out earlier? Were there intraoperative management things? Was it just everybody learned how to interpret the digital devices? In the article, you noted that you used 2 different devices, and there was kind of a jump in your removal. Was that related to that device?

Dr Mohamed El Zaeedi (New York, NY). For the first question, yes, it’s improvement in process. It is intraoperative as well as after the surgery, so during the case, we learned to be more gentle on the lung and more strategic on our dissection to minimize the air leak, and after the surgery, I think the team over time got more involved and more comfortable. The residents, fellows, and physician assistants feel more comfortable to assess the air leak using the digital device, and they don’t even have to go back and ask the attending. Once the criteria are met, they get the tube out, so I think everyone including the surgeon over time got on board and felt more comfortable removing the tubes.

Dr Robert Cerfolio. Matt wasn’t there in 2017, so unequivocally going to the Centese that had a pleural assessment. The Thopaz 1 and 2 (Medela Healthcare) don’t. You know, the angst of removing a tube 2 hours postoperatively was incredible, and so I was met with resistance, and once we had the Centese, I’d say, “Forget your dogma. We have a pleural assessment of negative numbers.” We have an air leak, even if it’s −40 or 50 (that’s why −20 was in quotes), so clearly the device was part of it but also the culture wrapped around the safety of it.

Dr Blum. The second question I have is about these 12 patients who developed an effusion that ultimately received thoracentesis. Was there any indication that chest tube drainage for a longer period of time would have prevented that?

Dr El Zaeedi. I don’t think so. Looking into historical data, keeping chest tubes longer usually doesn’t prevent thoracentesis, and the number of patients who required those interventions remained at the smaller percentage compared with the whole series, so I don’t believe keeping the chest tube would have changed that.

Dr Blum. Because those are both the 2 things that make people uncomfortable, can you remove them with air leaks, and are you going to have a pleural fluid collection that requires intervention.

My last question is about the process, and we talked about this a little earlier yesterday. You know, this is an academic
center. There are other thoracic surgeons there. This would be a process that would have been ripe for collaboration with the other surgeons. Why just a single surgeon? Why didn’t that happen?

**Dr Cerfolio.** Let me handle this. First, I want to thank Matt for doing what I think discussants should do. He made this educational. Now part of this is his own character and leadership, and I’m proud of that, but part of it is what the Western represents, and it is such a special place. It’s a unique place with culture. You have fun. The science is good, and people are honest, so I want all the members here to know how lucky we are to have the Western. I hope they never change the program and the format and keep the family atmosphere, so thank you and Western.

The answer is because I’m not a good enough leader, so if I was a great leader, all 8 of my partners would be doing this. Now I have 4 taking tubes out in the operating room. I have a couple who are young. I’m too old to have a complication. It doesn’t even make sense to me, but this is why we showed that last slide. What can we do to give our patients better care and to improve? Someone’s showing this is safe, and there’s nothing magical about what I’m doing in my operating room compared with everybody else. There’s no skill. There’s no talent. There’s no nothing. We’re doing the exact same thing you all are doing. If we can do it, anybody can do it.

The patients who had the effusions didn’t have higher or lower outputs. It doesn’t matter how much. The fact that people even look at volume doesn’t even make sense to me. We’ve been saying that for 15 years. We now know that’s true. There’s a cardiac article just presented at the Society of Thoracic Surgeons or American Thoracic Society that says that, so it’s dogma and resistance to change, and as I wrote in the editorial in the *Annals of Surgery*, it is the safety card. Every doctor plays the safety card. “It’s not safe, I don’t feel comfortable.” The 2 most dangerous words in medicine. “I don’t feel comfortable.” I don’t care about your comfort level. I care about the patient doing well. “It’s not safe.” Well, it’s not safe because you don’t think it’s safe, but a car driving by itself is coming, and it’ll be safe, and so is pulling a tube out at the time of surgery.

Is it perfect? No, all these people have chest x-rays that look bad. We get called by the radiologist. They all do well. As we got more and more comfortable doing it, more and more people will do it, so that’s why we put the bullet there, but I will tell you as an administrator, this is our biggest complaint about doctors. You know, we have 23 neurosurgeons who do this. Three do it much better than the other say 20, and yet we can’t get the other 20 to follow the 3, and that is a big problem, doctor variability from the C suite. So we should get better before we have people making us change or payers telling us. I will tell you what happened in the orthopedic hospital with knees where it used to be an overnight stay, and all the payers said, “We ain’t paying for it.” That is $150,000 down to $70,000 to the hospital. They’re all done as an outpatient, and don’t think that’s not going to happen to lobe and segment soon. It will, and we need to be ready for it.

**Dr Brian Cain.** There’s a question in the back.

**Dr Alexander Kraev.** I’m Sasha from Central Washington, and thank you for presenting these data. I think it’s awesome. Sara, my partner, went out and spent a week with you, and she brought it back, and we tried it, and we were in Montana, and we had a few failures. You know, the first failure, okay, we’re not going to change our practice, we’re going to keep trying this, and then 2, 3, and the trouble is when they’re presenting to the hospital 300 miles away, they’re getting an incision this big for a chest tube, but then they’re getting on an airplane, and there are so many bells and whistles that ultimately it became kind of painful for us and the patient that we’ve kind of abandoned it at this point, so I don’t know. I think the environment in New York City where everybody’s pretty close is different than more rural areas.

**Dr Cerfolio.** I disagree. The patients who had the tubes put in, were they treating the patient or the x-ray? Was the patient sick or did the x-ray look bad?

**Dr Kraev.** Yeah, that’s part of the problem. If you show up at a little critical care hospital, a pneumothorax is an emergency, and half the time they don’t call you, they just treat it.

**Dr Cerfolio.** There you go. Mo, what did you say the patients do when they leave the hospital? Whose cell phone do they get?

**Dr El Zaeedi.** They get the surgeon’s cell phone.

**Dr Cerfolio.** So the second they go to the emergency department (ED), you’ve failed, so they have to call you. Did you set them up with a pulse oximetry, and that shows heart rate and saturation. Don’t let them go to the ED.

**Dr Kraev.** Yeah, the Montana patients, they’re not going to call you. They’re too respectful.

**Dr Cerfolio.** Well, they’re too respectful to text you, okay. I’ll let that statement go.

**Dr Kraev.** So half of them don’t call us, and half of them, the ED doesn’t call us, so okay.

**Dr Cain.** So we’ll take a question in the back and then Dr Mitchell in the front.

**Unidentified Speaker 1.** Chris, Oregon. I agree with the sentiment. A quick mechanical question. What’s the pleural measuring device, the Centese, what’s the benefit to that as opposed to assessing for an air leak intraoperatively and just taking out the chest tube?

**Dr Cerfolio.** We use 3 things in the ED. We don’t immerse the lung in water. I think it’s a waste of time, but we have digital ventilators, so we ask the anesthesiologist, “What are you giving, and what are you getting out?” Our
criteria when we started this last study was -20. Now it’s 50, now it’s 75, so even with an air leak of 75, now that’s with them intubated on their side. Once you turn them over and extubate them, that 75 goes to zero, so the false-negative rate of the pleural assessment is much better than the false-negative rate of an air leak quantitative number, so that’s changed.

Unidentified Speaker 1. What about the history?

Dr Cerfolio. Well, you only have a few minutes in the operating room. In the beginning, we all bailed and said, “Let’s leave the tube out.” We’d turn them over, extubate them, and the 110 went to 6. Now I have to pull the tube out, and I can’t do a plastic surgical closure. I’ve got to re-prep and drape them when they’re awake because you want to make it look pretty, so now we’re just pulling them out in the operating room.

Unidentified Speaker 2. Dr Cerfolio, do you think one way to transition to this would be to have some kind of a carbon dioxide detector? I know it’s working for you with the digital meter, but a carbon dioxide detector on the chest tube. Have you thought about that kind of deal?

Dr Cerfolio. No, I haven’t thought about it. I’d love to talk to you about it. I’m not that smart. I’m not sure how that would help, but I’m happy to discuss it.

Unidentified Speaker 2. Sounds good.

Dr John Mitchell. I have 2 questions, 1 for Cerf and 1 for you. First, Cerf, why are you wearing a headlight during a robotic case?

Dr Cerfolio. Because I care about my staff and love them, so when the lights are on or off, I have a battery-operated headlight so they can put the lights on or off. It doesn’t matter because I can turn my headlight on anytime I want. I see better, and I’m 61. I need light to see a menu at the restaurant, and I need it in the operating room to sew.

Dr Mitchell. Okay, and then a question for you. Essentially, now 95% of your patients regardless of whether there’s a sleeve or other complicated resection don’t have a chest tube, and there are no air leaks, there are no problems, nobody gets a tube put back in. That’s quite remarkable, so I’ll acknowledge that, but the question I have for you is do they go home earlier? Maybe you said that, but I missed it, and when they go home, you had nobody come back to the ED, so beyond Cerf’s phone number, what other adjuncts do you use to keep people at home, keep them comfortable, and keep them safe?

Dr El Zaeedi. We send 90% of the patients home by day 1, and we give them very clear instructions. Especially if the patient has a fixed space on the chest x-ray or has subcutaneous emphysema, we educate the patient each time about what’s going to happen, how you’re going to feel, and when you should be worried, and we give the patient the surgeon’s cell phone, and they communicate with the surgeon many times. I think that’s the key. They feel more comfortable when they have an open discussion and they can reach out to the surgeon anytime. I think when they hear from the surgeon that everything is okay, you don’t need to come back, they feel more comfortable because they’re getting that advice from the surgeon who performed the surgery.

Dr Cerfolio. Yeah, but John is right. It’s not perfect. For instance, we had a first rib the other day. We had to put a chest tube back in there in the recovery room, and we had a patient we operated with a neurosurgeon and we had to put a tube back in. It’s just not in the series because they weren’t lobes or segments, and there are people out of our place that go to outside EDs, and then you’re screwed. Once they go to the ED, you’re screwed. You’ve got to tell the patient before they go there that the doctor has to call you or don’t go, and then you can talk them down. You can’t say they don’t call you in Montana. You’ve got to give the patient your cell phone and say, “You have to talk to me before you go to the ED, whether you’re respectful or not,” because once they go there, you’re screwed. They’re only going to get readmitted, and every ED doctor overtreats the pleural space, and they’re going to continue to do it, so it’s really incumbent on us, and there are people who will get admitted under observation. They don’t count as a readmission on the “database,” but they’re in the hospital for 12 hours or whatever at outside places and we’re able to get them home, so the “readmission” is zero, but people are observed. I think there was 2% of those in that series.

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