Discussion to: Preliminary results in tracheal replacement using stented aortic matrices for primary extensive tracheal cancer

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Dr Rafael Andrade (Minneapolis, Minn). Professor Martinod, this was an excellent presentation and I’d like to congratulate you and your team on really an impressive feat. This is the culmination of 25 years of work and a very scrupulous process from the lab to bedside and following strict ethical principles. So, it’s very impressive and I think it’s exemplary work on how to solve a difficult problem. I think these 13 patients, almost all of them had adenoid cystic carcinoma, and it’s a subgroup from your Triton study. The mortality you mentioned, 7.7% of morbidity, is in line with other studies of large tracheal resections. And the other important thing about this study is that these are patients who otherwise would have been unresectable. They would not have been able to have had surgery. So, you’re offering these patients some hope of cure. And in contrast to other more complex operations—particularly the forearm flap reconstructions methods with or without transplantation—it’s pretty simple.

It’s not this lengthy 2-stage operation or this lengthy 12-hour operation with high morbidity and mortality. So overall, this is very, very impressive. And finally, an 85% negative margin rate is also much higher than what has been reported in the past for adenoid cystic carcinoma, which is usually 50% to 60%. So overall, this is a wonderful example of how work should be done. So, I have 3 questions for you. The first thing that came to mind—and this is about the biology of the graft was, how do you manage to sew the trachea, which is a living organ, to this fairly inert tube, at least initially inert tube, because it doesn’t have blood supply, and get away with it without dehiscences? That’s my first question.

Dr Emmanuel Martinod (Paris, France). Thank you very much, Dr Andrade, for these very nice comments on our work. It was a surprise for us because at the beginning of the story, at our laboratory in Paris, we didn’t know what could be happening with these grafts. We know with our experience in vascular surgery that it is not very important that these grafts have been revascularized. Because in vascular surgery, when we replace vessels using cryo-preserved graft, there is no revascularization. And these grafts are submitted to a very high arterial pressure, and no rupture are observed in the majority of the cases. This is the first answer, and the second is that we clearly showed regeneration of the epithelium from the native trachea. And for the cartilage, I know that there is some doubt about this regenerative process, but we have a grant from France, from the ministry, and we are working hard with some immunologists, some scientists, and specialists in cartilage regeneration or epithelial regeneration—airway epithelial regeneration—to explain the mechanism.

But we know that after, for example, 10 years of cryopreservation, we can have some secretion of cytokines and growth factors, especially interleukin 33, after extraction of the graft from the ice. And we believe that this is the key point. And another fact is that most probably since the beginning of the story, we worked with a tissue bank in Paris, which is, I think, the only bank in Europe that...
uses −80 °C cryopreserved autologous grafts. And maybe it could be better than −150 °C grafts.

Dr Andrade. Okay, and then my second question. The least attractive part of this is the silicone stent that’s in for years in patients. Can you tell us a little bit more about how you manage these and how patients fare with these stents for periods of 4, 5, or more years?

Dr Martinod. As you have seen, we had some complications related to the stent, but the majority of patients experienced only granulomas at the extremities of the stent. We manage using flexible or rigid bronchoscopies. This is a collaboration with our pulmonologist. They do flexible bronchoscopies and we do rigid bronchoscopies by chance is by the natural airways.

Dr Andrade. And then finally, when do you extubate your patients?

Dr Martinod. On table, if it’s possible.

Dr Andrade. Thank you. Excellent work.