

Bronchospasm and airway clearing



Removing atelectasia

Firmin is a 20-year old patient with Purtilo syndrome. For this reason, he received an allograft donated by his sister in September 2015.

Three months after transplantation, liver, skin, eye and digestive GVHD (Graft-Versus-Host Disease) manifested.

Pulmonary GVHD was diagnosed in March 2016 at the chronic respiratory failure stage. Long-term oxygen therapy and nocturnal NIV was introduced. Firmin then presented an FEV₁ at 17% of the predicted values, and an FVC at 229% of the predicted values.

July 2016, *Scopulariopsis brevicaulis* colonisation manifested. After drug treatment, negative bronchial samples were observed in September, 2016.

From July to December 2016, Firmin showed great respiratory and motor improvement with daily physiotherapy, even several times a day. Physiotherapy helped to make Firmin an expert in autogenous drainage. Drainage was performed with oscillating PEP and a chest strap due to Firmin's airway hyperresponsiveness and significant distension. He was determined and never ceased to make an effort during this long hospitalisation. His willingness and sharp sense of humour made the sessions privileged moments.

He also had the full support of his family. In July, he could not leave his bed. In December, he was able to go up and down four flights of stairs. His chest expansion increased from 2 cm to 9 cm. He had gained weight and was due to be registered on the transplant list (pulmonary + liver) in early January 2017. Doctors even described his, "surprising respiratory status (eupneic in ambient air), given the previous severity of the respiratory condition".



Mathilde Proffit, respiratory physiotherapist

However, in late December, he suffered a febrile episode, hemoptysis and respiratory and functional degradation. *Scopulariopsis* infection re-manifested and greatly weakened him. His walking perimeter decreased and he began wearing the NIV night and day, with 2-h sessions during the day. He lost his appetite and weight; he was fed subsequently by parenteral nutrition during the night. Consequently, registration on the transplant list was delayed.

In early February, we were in a complicated physical and moral situation. Firmin had the feeling of having to start everything again, to be back in July 2016, and he did not feel he had the strength.

Testimonies

The first session was a bit difficult because we are not used to the machine and we do not expect what it makes us do. We breathe by the mouth more than anything else. The trick is to let it to happen. By the second or third session, we really manage to let it to happen by itself.

I am better able to increase my respiratory volumes. Easier and more, but especially easier. The secretions become much more fluid the next day and much easier to expectorate. Before, I suffered really heavy coughing and I was struggling to expectorate, whereas now, just after using the Simeox, cough = secretion, much easier and quicker to expectorate, without choking.

Now that I expectorate less, I always prefer to use the Simeox rather than oscillating PEP because I feel it is more efficient. Oscillating PEP may be a little less tiring, but I'm not sure to expectorate because I inspire less. While with the Simeox, I inspire more (ndlr inspires his current volume in the FEV) even if I do not expectorate immediately afterwards; by making a last effort, I manage to expectorate. Whereas without the Simeox, I think I wouldn't succeed.

Sometimes I go a little too far, I expire too long and it's a little stressful. That's why understanding how to use the Simeox is important because you always want to inspire, but you shouldn't. I would like now to have the Simeox with customised programmes and pauses a little longer."

In terms of drainage, he was no longer able to cough. We use the NIV during the sessions because of his fatigue. The secretions were white and frothy. They were the result of a proximal drainage only. We were unable to fetch secretions more distally because Firmin's airway hyperresponsiveness prevented us, and also his fatigue. We absolutely had to optimise Firmin's pulmonary drainage to help his body to

eliminate a maximum of Scopulariopsis. Registration on the transplant list requires three bronchial samples without spores. The drainage had to be optimal.

In this most delicate period, we introduced the use of the Simeox coupled with NIV.



From the first session, Firmin ceased to cough up this proximal frothy sputum

The sessions were shorter, more productive and Firmin felt a real gain in ventilation comfort following these three days of drainage with the Simeox.

He wanted to use the Simeox daily. While we were in a deadlock in this difficult situation with an exhausted patient, the Simeox was a great help. It allowed not only the achievement of more efficient drainage and gave a new dynamic to our duo, but also allowed Firmin to carry out much more comfortable sessions without



He expectorated this abundant and purulent mucus over the next three days

coughing. The Simeox is quite suitable in the sessions with fragile, polypneic and spastic patients.

We continue the adventure with Firmin and the Simeox now that this difficult period has passed. We can now look to the future and confidently pursue our physiotherapy sessions to better prepare Firmin's body before registration on the transplant list.