

Purpose

Ex vivo lung perfusion (EVLP) has the potential to assess bilateral lungs initially perfused en bloc which may ultimately lead to a single isolated lung being suitable for transplant. The purpose of this study is to explore the idea that EVLP may allow for individual assessment of lungs while en bloc and result in an isolated lung transplant when the contralateral lung is assessed as not being suitable for transplant.

Methods (Cont.)

EVLP assessment included, but not limited to:

- Radiograph images ^(A)
- Bronchoscopy ^(B)
- Blood gas differentials ^(C)
- Controlled deflation ^(D)
- Compliance metrics
- EVLP consultation to determine transplant suitability of one or both lungs.

Results

- In total, there were 17 en bloc EVLP cases that went on to transplant either as double lung or isolated transplant.
- 65%, (11), resulted in both lungs transplanted into single recipients.
- 29%, (5) were converted to isolated transplants of three left lungs and two right lungs.
- 6%, (1) was split and transplanted as two isolated lung transplants at different centers.
- Isolated lung metrics which resulted in transplant revealed a mean delta PaO₂ for the transplantable lungs at 422 mm Hg (Range: 412 – 479) and the non-transplantable lungs mean delta PaO₂ of 336 mm Hg (Range: 213 – 475 mm Hg).
- Bronchoscopy revealed watery/foamy secretions in 4 of 5 (80%) non-transplantable lungs.
- Results from controlled deflation showed 80% minimal to incomplete deflation of the non-transplantable lungs versus the transplanted lung group with normal deflation.

Conclusions

The results of these findings suggest the possibility of the EVLP system to assess the isolated function of bilateral lungs undergoing EVLP. Thus, retaining one lung for transplant out of the two optimizes the potential within the lung donor population.

References

- Cypel M, Yeung JC, Liu M *et al.* Normothermic *ex vivo* lung perfusion in clinical lung transplantation. *N. Engl. J. Med.* 364(15), 1431–1440 (2011).
- Clinical Trial Protocol PXUS 14-001

Acknowledgements

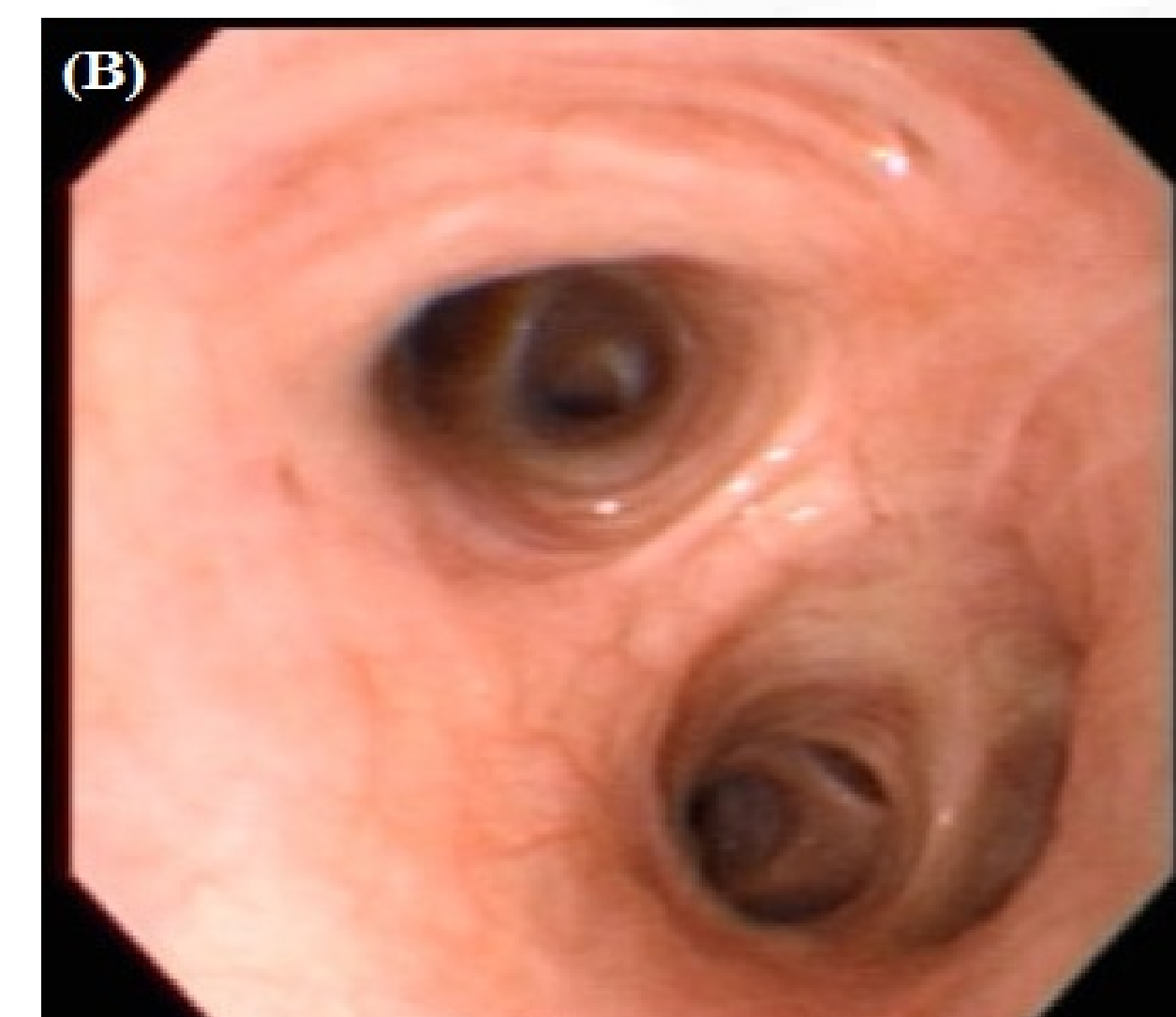
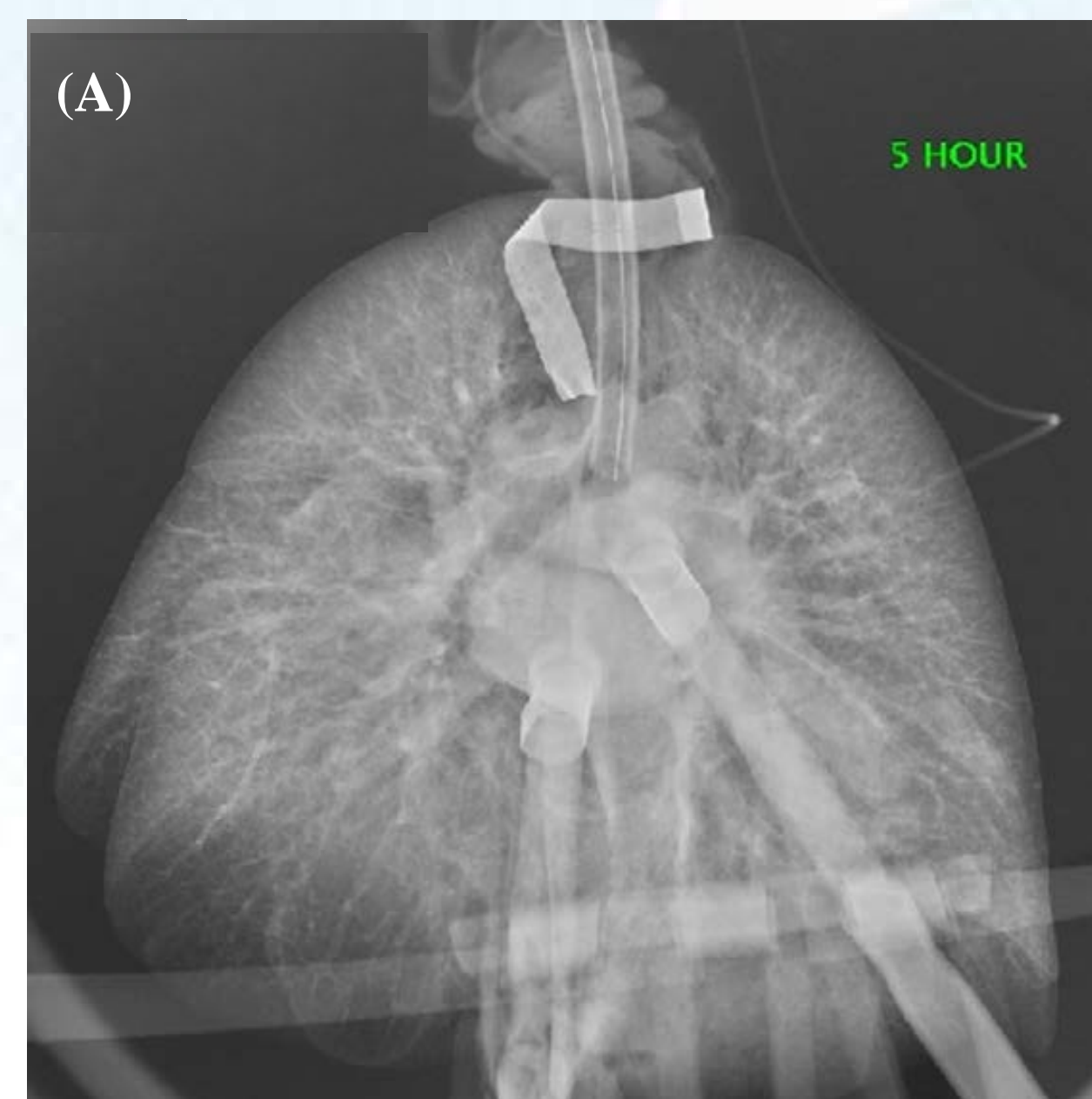
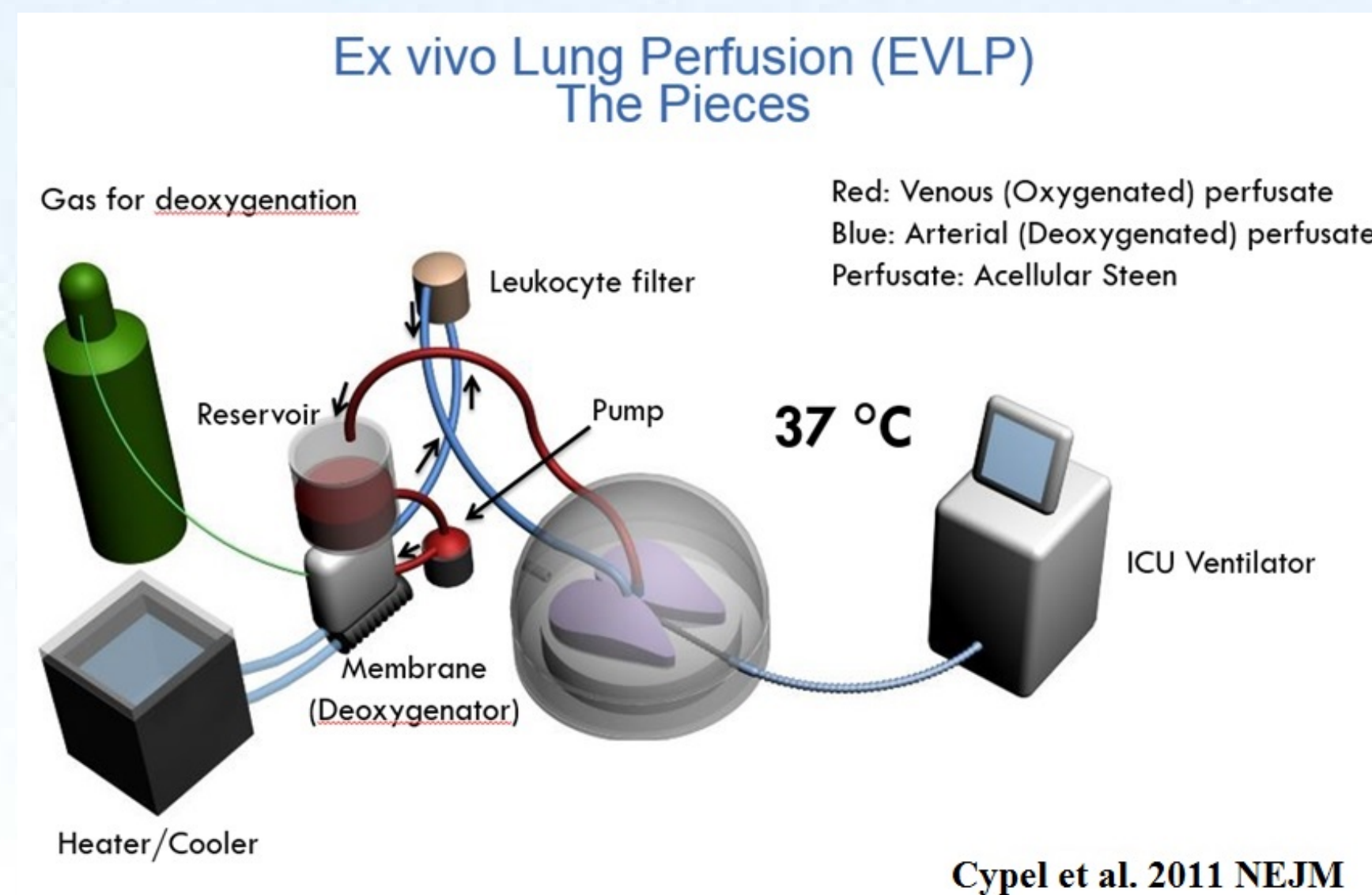
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Disclosure

- The Toronto EVLP system used to assess the lungs for this report is currently undergoing a clinical investigation in the United States.
- The system is for Investigational Use Only.
- Data presented do not reflect the full dataset anticipated under the clinical protocol design.
- Any conclusions drawn from these data are preliminary.

Methods

We reviewed a continuous series of clinical EVLP procedures performed at Lung Bioengineering's stand alone facility using the Toronto EVLP system between November 2014 and December 2016. Lungs in this series were all transplanted either as double lungs or isolated lungs. En bloc EVLP data were captured to assess single lung suitability for transplant following a determination that both lungs were not transplantable into a single patient.



(C) Differential PO₂

| Time | Hr | RUL | RLL | LUL | LLL |
|-------|----|-------|-------|-------|-------|
| 17:02 | 2 | 398.1 | 489.2 | 430.2 | 333.7 |
| 19:01 | 4 | 366.5 | 495.5 | 443.6 | 315.9 |

