

# ESOT Transplant Fellowship 2021 - Report

**Emilio Canovai MD, PhD**

**Host Institution: Cambridge Transplant Centre, Addenbrooke's Hospital, Cambridge University Hospital, Cambridge, United Kingdom.**

Honorable members of the ESOT Fellowship Committee,

## **Project description and outcomes achieved:**

As part of my personal development plan to become an Abdominal Transplant Surgeon, I was granted the support from the ESOT Committee to join the Cambridge Transplant Institute. In this world-renowned transplant center, I was allowed to participate in the full breath of Abdominal Transplantation including intestinal, liver, pancreas and kidney transplantation. This included both extensive clinical and research experiences.

### **1) Intestinal Transplantation: *Clinical experience.***

I was fortunate enough to join the Cambridge Intestinal Failure and Transplantation team. This multidisciplinary team of Surgeons and Gastroenterologists have the largest experience in Europe with this rare and complex pathology. They receive about 50-60 referrals from both the entire UK but also internationally for evaluation of intestinal transplantation (ITx). After careful consideration and a national approval process by a multicenter panel, about 10-15 these patients are listed and transplanted each year. During my time here, I was fortunate to first spend 4 months on the medical side, taking care of pre- and posttransplant patients. This allowed me to get to grips with the full breath of pre- and post-surgical care that these patients require, including many years after ITx. These include rare immunological, infectious and oncological complications that are unique to this population.

After this period, I transitioned to the surgical side of the ITx. Here I continued to participate in multidisciplinary meetings, clinics and emergency/elective operations on ITx. This was in addition to my routine clinical surgical duties as part of the Abdominal Transplant Team (see below). During this time, I became independent in ITx graft retrievals both liver- and non-liver containing grafts having performed 10 myself. I also participated more than 15 ITx and multiple elective and emergency operations post-ITx.

During this period, I also attended local and national multidisciplinary meetings as well as the clinics, where (potential) ITx patients are seen.

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## 2) Intestinal Transplantation: *Research experience*

Beside the immense clinical transplant experience, I also continued my research in the field. In June 2020, I defended my PhD entitled “*Novel Insights in Intestinal Transplantation and Modulation of Ischemia Reperfusion Injury*” under the supervision of Prof. Dr. Pirenne in Leuven. This marked the official completion of more than 5 years of research and was a moment of immense personal pride.

Furthermore, I continued to work on the GENetic Mutations in Intestinal Transplantation (GEM-IT) study. The aim of this study will be to assess the impact of certain genetic polymorphisms in the outcomes after ITx. We managed to get formal UK ethical approval after a rigorous vetting process. We managed to include more than 70 patients and their respective donors in this study. Together with our other participating centers (Paris, Leuven, Buenos Aires), we will have more than 120 patients in our study. In this small field, these are considerable numbers. The UK samples have since been dispatched to our lab in Leuven, Belgium for analysis. We will expect the first results in the next 3-6 months and to present the findings at the 2023 biannual, ITx symposium (which will be held in Chicago). If successful, we hope to improve our risk stratification by increasing surveillance and immunosuppressive therapies in patients at higher risk of rejection. In future, with the advent of rapid DNA analysis, we hope to improve donor/recipient matching. By avoiding the negative polymorphism combinations, we expect to help reduce the incidence of rejection/graft loss and thus improve long-term outcomes.

Due to the large volume of patients in follow-up at Cambridge, I was also able to perform several retrospective studies. These include research into the effect of portal versus systemic drainage of the small bowel, contributing to a review on the role of abdominal wall transplantation (to facilitate abdominal closure after ITx) and the role of ITx to treat extensive, neuro-endocrine tumors.

All these experiences, are allowing me to prepare for my return to my home institution where I will complete my fellowship training before becoming a staff member there. Due to this experience, I will be able to continue combining research with my clinical transplant activity with a special attention to ITx.

The kind support by ESOT allowed me both the additional time and financial support to facilitate this.

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### **3) General Abdominal Transplantation:**

Besides the unique ITx experience, Addenbrooke's Hospital is also a high-volume liver, pancreas and kidney transplant center. With regards of the liver transplantation, this institution performs about 100 liver transplants each year and has extensive experience with machine perfusion. Both normothermic regional perfusion (NRP) and normothermic machine perfusion (NMP) are extensively used, both in DCD donation and assessment of marginal grafts. During my time at Cambridge, I was trained by Prof. Dr. Chris Watson and Mr. Andrew Butler to be independent in putting livers on the NMP machine and performing NRP retrievals. This included the surgical techniques but also the interpretation of the various biochemical assessments used to evaluate the liver graft. Learning these emerging technological advances will be crucial as they are rapidly becoming standard of care, especially in marginal donor organs. Furthermore, this technology will only expand further to allow organ reconditioning and improved logistics.

Equally, more than 200 kidney transplants are performed annually at Cambridge. This includes 50 living donations, which are done fully laparoscopically. During my time here, I have performed many kidney transplants, including about 20 in an independent fashion. The volume presented at CUH has allowed me to accelerate my learning curve. Furthermore, we do not have fully laparoscopic living kidney donation at my home center. My experience at Cambridge will hopefully allow us to roll out the implementation of this technique at our center.

Furthermore, this center has a large experience in pancreas transplantation (mostly SPK) at about 20-25 per year. Interestingly, about 40-50% of these grafts are from DCD donors, something I do not have experience with in Belgium. Given that the outcomes are very similar, this could help encourage our team to start accepting such organs. On top of that, I learned different surgical techniques such as variations of graft locations and type of enteric anastomosis that has provided valuable, added insight.

Finally, Cambridge provides one of the National Organ Recovery Teams (NORS) that provide national deceased organ retrieval cover. It is the second-most busy team in the country and performs about 250 multi-organ retrievals per year. This includes both DBD and DCD procedures. During my time here, I have performed more than 60 retrievals, including all abdominal organs. Although, I was already quite experienced in Belgium, this period has allowed me to learn additional valuable skills and gain some important insights.

### **Overall experience:**

I find it hard to express how valuable this experience has been and how grateful I am to the ESOT family for supporting this. The Cambridge team took me in as one of their own from day 1. I have made valuable, professional connections with renowned colleagues as well as many new friends for life. I was exposed to the full spectrum of abdominal transplantation, including innovative perfusion technologies and novel surgical techniques. I was immersed in ITx, following patients through the full pathway of referral, transplantation and short- and long-term follow-up.

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From a research point of view, my hope is that through the connections made by the GEM-IT study, we can maintain a long-term framework for multicenter collaboration. This will be vitally important, as the rare nature of ITx makes data generation much more challenging.

Let me end thanking you all very much for giving me this immense opportunity. I have learned from and enjoyed every moment of it. These ESOT programs as truly vital in supporting international exchange of young transplant professionals and this is an immense asset to the community as a whole.

Respectfully yours,

Emilio Canovai

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