



The Spanish National Transplant Organisation (ONT), which promoted the international development of this programme among the countries of the South Transplant Alliance, has coordinated the operation

Spain and Italy perform the first international paired kidney exchange in Southern Europe

- One patient in Spain and another in Italy were able to receive a living-donor kidney transplant thanks to the exchange of organs from their respective donors. Donors and recipients are doing well and have already been discharged
- The transplants were performed at the Fundació Puigvert in Barcelona and the Ospedale Cisanello in Pisa. Their implementation involved complex logistics and required full coordination between the professionals of the countries involved in the operation
- Participating in this first successful matching run as part of the International Paired Kidney Exchange programme were 10 Spanish hospitals, 3 Italian hospitals and 1 Portuguese hospital, with a total of 113 pairs, 79 Spanish, 19 Portuguese and 15 Italian
- It aims to offer patients awaiting a kidney transplant in any of these three countries the opportunity to receive a living-donor graft, despite the fact that their partner or relative is incompatible
- The ONT provides its experience and the IT platform to analyse the exchange possibilities between pairs registered in the International Registry. It also carries out the matching runs, reports on the outcomes and coordinates the logistics

8 August, 2018 - Spain and Italy perform first international paired kidney exchange in Southern Europe. One patient in Spain and another in Italy have received a living-donor kidney transplant thanks to the exchange of organs between their respective donors. Donors and recipients are doing very well and have already been discharged.

The kidney removals and transplants were all performed on the same day, 19 July, at the Fundació Puigvert in Barcelona, a leading hospital for paired kidney exchange, and the Ospedale Cisanello in Pisa.

The paired kidney exchange programme is based on the exchange of living kidney donors between 2 or more pairs. It aims to offer patients with chronic kidney disease the opportunity to receive a living-donor graft, despite the fact that their partner or relative, who would like to make the donation, is incompatible.

This type of transplant involves a **complicated logistical process**, further complicated by its internationalisation, which required full collaboration between the head offices of the national transplant organisations in Spain and Italy, the territorial and/or regional transplant coordinators and the medical teams at the two hospitals that took part in this operation. There were only **8 weeks between the day the ONT performed the matching run**, which detected the possible compatibility between these two pairs, and **the transplants**.

14 hospitals participated in this first successful matching run as part of the International Paired Kidney Exchange Programme. 10 of these hospitals are Spanish, 3 Italian and 1 Portuguese, with 113 donor-recipient pairs: 79 Spanish, 19 Portuguese and 15 Italian (**See attached tables**)

The paired kidney exchange programme is one of the forms of living-donor kidney transplants launched by the ONT in Spain almost a decade ago after developing a joint working protocol in collaboration with a multidisciplinary working group. The first paired kidney exchange was performed in Spain in July 2009. Since then, 194 transplants of this kind have been performed in Spain under the national programme.

Paired kidney exchange is a highly developed therapeutic modality in certain countries with a high level of living-donor kidney transplant activity. This is the case in Australia, Canada, South Korea, the United States, Holland and the United Kingdom, which have been performing this type of procedure for some time now with excellent results.

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The use of increasingly less invasive surgical techniques and the study and care of the donor (before, during and after the procedure) have boosted this type of transplant, given that any possible complications for the donor have considerably decreased and, at present, living kidney removal is considered a low risk procedure.

DONOR-RECIPIENT PAIR REGISTRY

We must remember that the **donor-recipient pair registry** is a fundamental aspect of the programme, which requires a computer application to perform the matching runs and quickly see the outcomes.

Spain, through the ONT, was the very driving force behind the creation of the International Paired Kidney Exchange Programme among the **countries making up the South Transplant Alliance** (Spain, France, Italy, Portugal, the Czech Republic and Switzerland). Italy and Portugal decided to participate alongside Spain in the first matching run that led to this first transplant. However, it is likely that the remaining countries will gradually join in as they see the results.

The programme must be supervised by the head of the national paired donation programmes in each participating country: in this case, Italy, Portugal and Spain.

The internationalisation of this programme aims to increase the chances for pairs to find a compatible donor and be able to exchange their donors' organs. The more pairs taking part in the programme and the greater their genetic heterogeneity, the more options there are for effective kidney donation and exchange.

Other countries in Northern and Central Europe are working in the same direction.

THE ONT PILOTS THE PROCESS

The ONT, which has coordinated this operation at all times, has provided its experience in this kind of transplant **and also the IT platform** to analyse the **exchange possibilities between the pairs registered in the International Registry.**

The ONT is also responsible for **managing the matching runs for the pairs**, appropriately informing the participating countries of the possible combinations detected after each matching run and drawing up an annual report on the outcomes. In order to achieve this goal, the online platform of the ONT's

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paired kidney exchange programme, which contains information on all incompatible donor-recipient pairs, has been adapted. This platform is found at the ONT where the staff are responsible for its maintenance and administration.

(TABLE 1) PAIRS PARTICIPATING IN THE INTERNATIONAL REGISTRY

SPAIN	No. of pairs
Fundación Puigvert	5
Hospital Carlos Haya	15
Hospital Clinic i Provincial	18
Hospital del Mar	6
Hospital General de Vall D'Hebrón	7
Hospital Germans Trias i Pujol	3
Hospital Univeritari de Bellvitge	7
Hospital Universitario 12 de Octubre	16
Hospital Universitario Virgen del Rocio	2
Total Spain	79
ITALY	
Hospital of Pisa	9
Hospital of Siena	6
Total Italy	15
PORTUGAL	
Hospital San Antonio de Oporto	19
Total Portugal	19
Overall total	113

(Table 2) HOSPITALS PARTICIPATING BY COUNTRY

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SPAIN	ITALY	PORTUGAL
Hospital de Cruces	Hospital of Pisa	Hospital Santo Antonio Oporto
Hospital Clinic de Barcelona	Hospital of Siena	
Hospital Valle Hebrón	Hospital of Bologna	
Hospital of Bellvitge		
Hospital Del Mar		
Fundación Puigvert		
Hospital Germans Trias i Pujol		
Hospital 12 de Octubre		
Hospital Virgen del Rocío		
Hospital Regional de Málaga		

THE TRANSPLANT IN STAGES

- **24/05/2018:** The ONT performs the matching run which detects the possible compatibility between some of the pairs included in the International Registry and informs the countries taking part in the programme. Finally, a decision was made to consider the possibility of performing the exchange between a Spanish and an Italian pair.
- **04/06/2018:** The national transplant organisations of Spain and Italy approve the match.
- **18/06/2018:** Dr. Lluís Guirado, head of the nephrology service at the Fundació Puigvert in Barcelona and Dr. Emanuele Cozzi, leading immunologist in the Italian National Transplant Coordination Services, confirm the immunological compatibility of the donors in Barcelona and Pisa. The histocompatibility analyses were performed in the laboratories of Pisa and Florence in Italy and in the HistoCat at the Hospital Clinic in Spain.
- **29/06/2018:** The transplant centres in Barcelona and Pisa inform the ONT and the CNT of the clinical suitability of the two pairs involved in the paired exchange.
- **04/07/2018:** Clinical and instrumental data are exchanged between the Spanish and Italian hospitals regarding the two pairs involved in the paired exchange.
- **11/07/2018:** The medical teams of both countries set the date for the nephrectomies and transplants.
- **19/07/2018:** Between 9 a.m. and 7 p.m. the kidney removals are performed in Barcelona and Pisa, the organs transported and exchanged at El Prat airport and the transplant procedures completed.
- A few days later, donors and recipients are discharged.