

Organ donation after circulatory death in Switzerland: slow but constant progress

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Introduction

Worldwide, the number of patients wait-listed for organ transplantation is growing. In most countries, however, there is a shortage of donor organs. Switzerland has one of the lowest *post mortem* donation rates among European countries. While most organs donated for transplantation are retrieved from primary or secondary brain-dead donors with sustained circulation (heart-beating donors), organ donation after circulatory determination of death (DCD or non-heart-beating donors) is increasingly accepted to partly compensate for the general shortage of organs suitable for transplantation in many countries. This is the case especially regarding kidney transplantation, where waiting lists are long and transplantations with standard-criteria DCD kidneys can increase the survival of patients with end stage renal disease [1]. According to the so-called Maastricht classification, DCD donors are classified into “uncontrolled DCD” for Maastricht categories I (dead on arrival) and II (unsuccessful resuscitation), and “controlled DCD” for Maastricht categories III (awaiting cardiac arrest) and IV (cardiac arrest while brain dead and allocation completed) [2]. In Switzerland, the procurement of organs from DCD donors is only allowed if cardiocirculatory arrest occurs within 60 minutes after therapy withdrawal, followed by brain death diagnosis after 10 minutes of documented circulatory arrest. Artery cannulation for distal perfusion or invasive measures, such as a fast track laparotomy, are not allowed before brain death diagnosis. One should keep in mind however, that DCD is only possible from selected patients. Furthermore, organ procurement from DCD donors is a demanding procedure which is mainly performed in highly specialised centres. Therefore, the number of DCD donors and the impact on the transplant activity remains relatively low.

DCD in Switzerland

In Switzerland, DCD was introduced in 1985, but it was stopped after the introduction of the national transplant law on the 1st of July 2007 due to legal uncertainty [3–5]. Physicians and surgeons refrained from retrieving organs from DCD donors because it was unclear whether the law allowed preparatory medical measures with regard to DCD,

and due to issues concerning the timing of request. In addition, there was an apparent inconsistency between the law and the guidelines of the Swiss Academy of Medical Sciences (SAMS). In order to clarify the legal issue, Swisstransplant brought together the decision makers of the transplant centres, representatives of the Federal Office of Public Health (FOPH), and the SAMS. Following that, a legal opinion by the FOPH made clear that DCD was authorised by law, and that the SAMS guidelines ought to be adjusted to allow preparatory medical measures with regard to DCD [4, 5].

After the analysis of the legal situation and the adaption of the SAMS guidelines, the Zurich University Hospital was the first to reintroduce a DCD programme in late 2011 (Maastricht category III; procurement of lungs, livers, pancreas and kidneys) [6]. Today, kidneys from DCD donors are also being procured in the Cantonal Hospital St. Gallen (Maastricht category III) and in the Geneva University Hospital (Maastricht category II). The other transplant centres (Basel, Berne and Lausanne University Hospitals) are evaluating the potential for DCD in multidisciplinary teams, as well as the modalities and ethical aspects in view of a reintroduction of DCD programmes.

In total, the number of DCD donors steadily increased from 3 in 2011 to 7 in 2012 and 12 in 2013 [7]. Similarly, the percentage of DCD donors relative to the total of deceased organ donors in Switzerland grew from 2.9% in 2011 to 7.3% in 2012 and reached 10.9% in 2013. The donation rate per million of population in 2013 was 1.5 for DCD, as compared with 12.0 for donation after brain death. Between 2011 and 2013, 55 organs were transplanted from the 22 DCD donors, equalling an average yield of 2.5 organs per donor. Compared with the international data, the average number of organs transplanted per DCD donor in Switzerland is relatively high [8]. This is mainly due to the expertise of the medical staff committed to the DCD programme in Zurich University Hospital where not only kidneys, but also lungs, livers and pancreas are evaluated and procured, if deemed suitable for transplantation by the experts.

DCD in Europe

The International Registry in Organ Donation and Transplantation mentions twelve countries in Europe that had a DCD programme in 2012. Besides Switzerland, these are Austria, Belgium, the Czech Republic, France, Italy, Ireland, Latvia, the Netherlands, Romania, Spain, and the United Kingdom [9]. According to a study published in 2011 on behalf of the European Committee on Organ Transplantation, seven countries had no present or planned DCD activity, namely Bosnia-Herzegovina, Finland, Germany, Greece, Hungary, Lithuania and Turkey. In these countries, except for Turkey, DCD was forbidden by law [2]. The highest DCD donation rates per million of population (pmp) in Europe are reported for Latvia (11.5 pmp), the United Kingdom (7.9 pmp), the Netherlands (7.4 pmp), and Belgium (6.3 pmp) [9].

In a recent comparison of the effect of promoting DCD policies on donation rates after brain death, Bendorf et al. found that in most countries, DCD makes a relatively small contribution to the overall deceased organ donor rate [8]. In addition, the average number of organs retrieved from DCD donors was significantly lower than from brain-dead donors. They also observed that countries with higher DCD rates tend to have lower donation after brain death rates. These findings led them to conjecture that in some countries and to a certain degree, DCD donors might be sourced from potential DBD donors. Therefore, they concluded that there is a risk that the promotion of DCD might come at the cost of reducing donation after brain death, and thus it may not be an effective approach to enhance the overall number of organs available for transplantation [8].

Conclusions

Today, we are in a situation where approximately 10% of deceased organ donors in Switzerland are Maastricht category II and III DCD donors. In view of the low organ donation rate, this means that even though the number of DCD donors is relatively small, some more patients on the waiting list may benefit from a transplant. The long-term outcomes of transplantations from DCD donors are comparable with that of organs retrieved from brain-dead donors [10]. One should keep in mind, however, that DCD is a resource-intensive process which requires an interdisciplinary approach, and clearly defined guidelines. In addition and importantly, potential organ donors should always be considered for heart-beating donation after brain death first, and for DCD only if they do not fulfil the clinical criteria of brain death at the time of therapy withdrawal.

In summary, DCD can and should be considered as a valuable option in selected patients. This is reflected by the high acceptance of DCD among the next of kin and the similar or slightly higher consent rate compared with donation after brain death. Sometimes, DCD is a possibility to honour a patient's explicit wish to donate her or his organs. This may be the case when, according to the guidelines of the Swiss Medical Association, the discontinuation of therapy is indicated, but the patient does not fulfil the clearly

defined brain death criteria. On behalf of the patients on the waiting list and the health care professionals involved in organ transplantation, I would like to express the deepest appreciation to everyone who is considering donating their organs.

Acknowledgements: I wish to express my sincere thanks for the implementation of the DCD programmes and the review of this editorial to Yvan Gasche, Leo Bühler (Geneva University Hospital), Roger Lussmann (Cantonal Hospital St. Gallen), Markus Béchir, Renato Lehnerr (Zurich University Hospital), and Christoph Haberthür (President of the Comité National du Don d'Organes (Swisstransplant)). In addition, I thank the teams in the accident and emergency departments, the teams in the intensive care units, as well as the multidisciplinary teams (surgeons, transplant coordinators, neurologists, nursing staff, ethicists) for their support with the setup and reintroduction of the Swiss DCD programmes. I would also like to thank Julius Weiss for his assistance in preparing the manuscript.

Funding / potential competing interests: No financial support and no other potential conflict of interest relevant to this article were reported.

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