



Pancreas Alone Grafts from Cardiac Death Donors; is Procurement Damage an Issue?

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Authors' contributions

This work was carried out in collaboration between all authors. Authors FGA and RC contributed in data collection and wrote the manuscript. Authors JF, SW and DT supervised and overviewed the work. All authors read and approved the final manuscript.

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Short Research Article

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ABSTRACT

Aims: In order to minimize damage to DCD (deceased cardiac donors) pancreatic grafts the donor surgery has to proceed as quickly as possible. Because of this previous studies have suggested that organs procured (liver and kidney) from DCD donors have higher discard rates. The aim of this study was to establish whether DCD pancreatic grafts were more likely to be damaged and discarded when compared to conventional DBD (deceased brainstem) pancreatic grafts.

Methods: Data was collected retrospectively from pancreatic alone organ offers to our single centre over a 12 month period and analyzed, Simultaneous kidney pancreas (SPK) grafts were excluded.

Results: Of 33 pancreas alone offers 15 were DCD's and 18 were DBD's. There was no difference in leading cause of death between DCD or DBD donations of which intracranial hemorrhage was the most frequent and Hypoxic brain injury [joint with cardiovascular accidents (CVA) for DBD donations] the next most frequent cause. There was also no difference in BMI between the two groups. For DCD's the mean donor age was 45.5 years compared with 42.6 years for DBD organs.

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6% of all organs were discarded (n=2) because of procurement damage and all were from DBD donors. Of the remaining 31 organs only 6 were transplanted (DBD n=5 to DCD n=1). The leading cause of decline for the remaining 27 organs was donor history for both groups followed by prolonged cold ischemia for DBD's and other logistical reasons for DCD's. Procurement damage was the third most common cause of decline for DBD pancreas alone grafts.

Conclusions: Although there did not appear to be a higher incidence of pancreatic graft damage when the organ was retrieved from a DCD donor in comparison to DBD donors, there are still organs being discarded because of procurement damage. Enhanced training techniques/supervision during the retrieval process still need to be optimised to reduce organ discard rates even further so no organs are ever wasted because of procurement damage.

Keywords: Deceased donor; pancreas; procurement damage.

1. INTRODUCTION

With the current era of donor organ shortage, surgeons have an increased responsibility to maximize safe procurement of donor organs to maximize the utility of these organs [1]. En-bloc procurement of organs with subsequent isolated transplantation of all abdominal grafts has gained popularity [2]. Combined harvesting of liver and pancreas in particular has become a reasonably common practice [3,4]. The added pressure of rapid organ retrieval to minimize ischemic injury in DCD donors may lead to a higher risk of injury to harvested organs as suggested by previous studies showing a higher discard rate of liver and kidneys from DCD donors [5,6].

The aim of this study was to establish whether DCD pancreatic grafts were more likely to be damaged and discarded when compared to conventional DBD (deceased brainstem) pancreatic grafts.

2. METHODS

Data was collected retrospectively from pancreatic organ retrievals over a 12-month period from a single centre. All pancreas alone offers were included, excluding Simultaneous Kidney-Pancreas (SPK) grafts. Patient demographics, cause of death, confounding patient variables (including medical history), ischemia times and damage, and logistic causes of organ rejection were recorded. Data was analysed using SPSS version 21 (2012) and p value of 0.05 was considered significant.

3. RESULTS

Over the twelve month period January 2012- December.2013 there were 33 pancreas alone offers (18 DBD Vs 15 DCD). Patient age (DBD 42.6 years Vs DCD 45.4 years, p value 0.51),

BMI (DBD 24.9 Vs DCD 25.7, p value 0.607) and cause of death (Table 1) showed no statistically significant difference between the two groups. 6% of all organs harvested were discarded (1 parenchymal damage and 1 vessel damage), all from brain dead donors. Procurement damage was the third most common cause of rejection for DBD pancreas alone grafts whereas no DCD organs were discarded due to procurement damage. The procurement damage pancreas discard rate for our centre was greater for DBD than DCD. Of the remaining 31 organs only 6 were transplanted (DBD n=5 Vs DCD n=1). The leading cause of decline for the remaining 27 organs was donor history (including co-morbidities, age, cause and mechanism of death) for both groups followed by prolonged cold ischemia for DBD's and other logistical reasons for DCD's (Fig. 1).

Table 1. Causes of death in the two groups

	DBD (n=18)	DCD (n=15)
Intracranial haemorrhage	10 (56%)	6 (40%)
Hypoxic brain injury	2 (11%)	4 (27%)
CVA	2 (11%)	1 (7%)

4. DISCUSSION

Shortage of organs available for transplantation remains a major challenge in this era of growing demand and despite an increasing number of potential donors, the gap between supply and demand is still vast [7]. Optimisation of the brain or cardiac dead donor is essential in ensuring good quality organ harvest for maximum utilization [8]. Common challenges in donor management include hypothermia, hypotension, diabetes insipidus (especially in brain trauma) and cardiac dysfunction [8] with various protocols introduced to optimise the deceased physiologically [7].

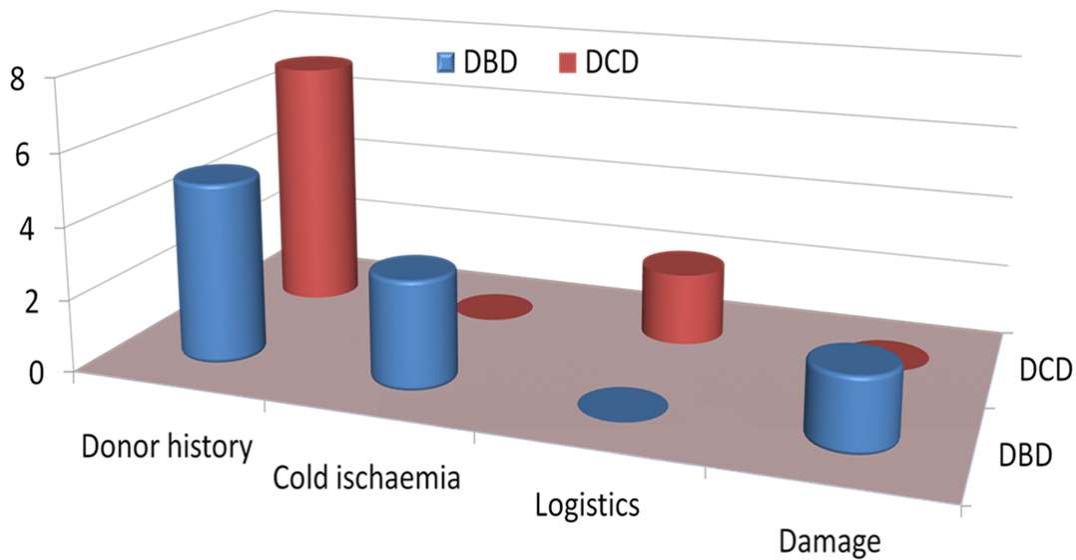


Fig. 1. Pancreas alone offers; Causes of organ decline

Advances in protocols as well as training have minimised wastage of organs due to procurement damage however a proportion of donor organs are still lost due to this factor alone.

Organ procurement whether isolated or en-bloc poses diverse challenges since each organ requires different ideal conditions for harvesting and different windows for ischemic damage [2]. Pancreas is often harvested en-bloc with liver or small bowel [1-3]. This warrants special attention to careful surgical dissection so that an optimum axial blood supply to all the organs is ensured [9]. This also allows safer dissection on the back table for the future liver graft [10] as well as focusing on the preservation of the inferior pancreaticoduodenal artery and the splenic artery for the safer use of the pancreas graft when used in isolation [9]. Due to the life saving nature of liver transplantation, it usually has priority over pancreas procurement however techniques have been reported to maximize safe pancreas retrieval as well [2]. Historically the pancreas graft was even sacrificed to ensure safe procurement of the liver graft [7]. There is limited data to date reporting isolated small bowel harvest enabling isolated safe harvest of pancreas for transplant [11,12]. The series by Abu-Elmagd [9] reports a pancreas discard rate of 60% when harvested with small bowel, especially if the donors are young. In addition to the importance of chronological order in multi organ retrieval, the speed of retrieval is as important. As compared to the more controlled environment of DBD procurement, DCD organ harvesting is a much rapid se-

quence of events in order to avoid ischaemic injury to organs. This increases the risk of procurement damage and has been documented in previous studies focusing on kidneys and livers [5,6]. These studies have however, not looked into pancreas which poses its own procurement challenges. In contrast to these studies and where pancreas is concerned, the procurement damage organ discard rate for our centre was greater for DBD than DCD organs. Reduced organ damage rates for DCD pancreas organs when compared with DBD's may be due to retrieval technical differences and higher rate of concurrent liver procurement in DBD organs.

5. CONCLUSION

Deceased donor organ retrieval can lead to significant procurement damage causing wastage of organs. This can be an issue in brain dead donors as well as donors after cardiac death. It is essential that we keep organ discard rates for procurement damage to a minimum and we recommend enhanced training techniques and supervision during the retrieval process to further reduce these rates. Further damages should be clearly reported to the accepting transplant centre so an informed decision regarding its use can be made.

CONSENT

It is not applicable.

ETHICAL APPROVAL

In view of the retrospective nature of this study, ethical approval was not deemed necessary.

DISCLAIMER

This manuscript was presented in the conference "ASGBI International Surgical Congress 2014" available [link is "http://www.epostersonline.com/asgbi2014/?q=node/2106"](http://www.epostersonline.com/asgbi2014/?q=node/2106) date April 30 - May 2, Harrogate, United Kingdom.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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