

LETTER TO THE EDITORS

Feasibility of safe procurement of isolated intestinal and pancreatic grafts

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Abdominal organs of paediatric/young donors are a vital but rare resource potentially contributing to maximum number of good quality grafts per donor, hence ensuring the safety and transplantability organs procured from these donors is essential. Paediatric and adult patients awaiting intestinal transplantation were relatively disadvantaged because of the lack of sufficient small-sized donors, before some countries introduced changes to organ allocation prioritizing intestine containing grafts [1,2]. These changes are to the benefit of intestine transplant recipients; however, vascular compromise or even sacrifice of pancreatic grafts is possible when isolated intestine grafts are procured. This is more likely to occur if the liver, intestine and pancreas grafts are procured individually, hence the call for prioritization of the liver graft over the pancreas from the same donor [3].

The vascular anatomy of the duodenum and pancreas head region relies on the integrity and collateralization of the fine arterial arcade and collateralization, fed by both celiac and superior mesenteric axis (SMA) (Fig. 1) [4]. Preservation of the inferior pancreatic-duodenal artery (IPDA) is the key to successful pancreas graft outcomes providing main arterial inflow to the head of the graft. Furthermore, the dorsal pancreatic artery may arise from the 1st jejunal branch of the SMA [5,6]. Isolated small bowel procurement therefore is a technically challenging operation that requires explicit anatomical knowledge related to blood supply of all abdominal viscera [7].

Our experience in the field of isolated small bowel procurement suggests that safety of all three solid organs can be ensured, enabling individual procurement of each of these for transplantation. We employ a “near-total” warm phase dissection during organ procurement, which differs from previous technical reports describing the separation of individual organs on ice bath [8]. Advantage of our technique relies on complete isolation of the blood supply of individual organs under clear and direct vision, and also minimizing the cold ischaemic time. The initial steps of organ procurement are similar to general abdominal multi-visceral procurement technique, including Cattle-Braash manoeuvre [9] and isolation of SMA as it emerges from the aorta. The two crucial and added steps in our technique

involve a) posterior mobilization of the pancreas to expose the left side of the aorta and b) dissection of root of the mesentery. The lateral dissection of the aorta from the left side should expose the celiac trunk and SMA as they emerge from the aorta. Dissection of the mesenteric root is challenging. First the superior mesenteric vein and then inferior pancreatico-duodenal vein (IPDV) identified. The line of vessel transection should be just below; IPDV also provides the anatomical landmark to identify the IPDA originating from the SMA. Fine dissection around the SMA is postponed to the cold phase to avoid unwarranted bleeding and haematoma formation. During the cold phase the course of the SMA is traced from the lower border of the pancreas into the root of the mesentery, and generally the 1st jejunal branch is preserved at transaction of SMA. Length of the SMA for intestinal graft anastomosis is obtained by distal dissection in to the root of the mesentery.

Recently, authors have procured six isolated small bowel grafts with preservation of the pancreas as a transplantable quality graft. These pancreata were exported to the pancreas transplant centres and outcomes were followed up in the National database. Of the six grafts, four were successfully transplanted. In the medium term follow up all these grafts reported to perform well. However, two grafts were discarded by transplant centres; in one case fatty graft was the primary reason along with graft injury cited as a cause for discard. In the only remaining graft, short graft vessels were perceived as procurement injury. This probably arises from lack of communication between the procurement and implanting teams. There is limited number of publications in the literature on isolated small bowel procurement, preserving the pancreas also as an isolated graft [8,10]. UNOS data suggest from 159 adult donors, isolated pancreata have been transplanted that were procured from a same donor of an isolated small bowel graft. The same series reports the experience from a single procurement organization where pancreas organ discard rate of nearly 60% when procured from the same donors, primarily because of younger age [10]. The pioneering reports describing the technique of isolated pancreas procurement from intestinal donors also suggest higher pancreas discard rate when the donors are young [8].

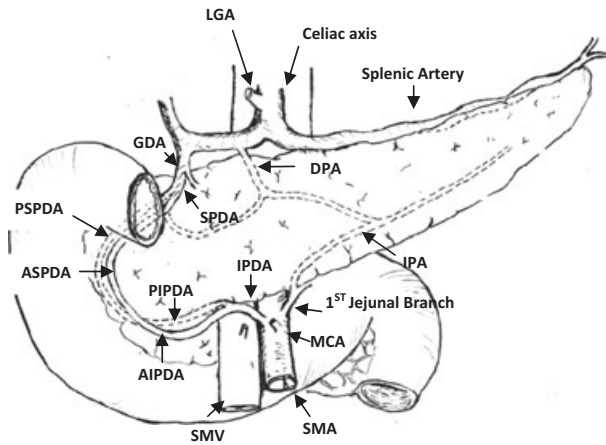


Figure 1 Pancreatic arterial anatomy. The arterial anatomy of the pancreas with anastomosis in the region of pancreatic head. AIPDA, anterior inferior pancreaticoduodenal artery; ASPDA, anterior superior pancreaticoduodenal artery; DPA, dorsal pancreatic artery; GDA, gastroduodenal artery; IPA, inferior pancreatic artery; IPDA, inferior pancreaticoduodenal artery; MCA, middle colic artery; PIPDA, posterior inferior pancreaticoduodenal artery; PSPDA, posterior superior pancreaticoduodenal artery; SMA, superior mesenteric artery; SMV, superior mesenteric vein.

Our experience confirms that isolated pancreas procurement is possible and transplantation of such grafts is safe even when the small bowel grafts are procured simultaneously. The advantage in smaller size donors is the reduced amount of mesenteric adipose tissue making the warm phase dissection and identification of the anatomical planes easier. On the other hand many of the important side vascular branches described above are smaller in diameter; hence a delicate dissection is mandatory for safe procurement and transplantation of organs. As described above the technical success relies on not-embarking the crucial steps until the cold phase is begun [8]. For example, the lateral and posterior dissection of the superior mesenteric vessels during the warm dissection may be detrimental to the both pancreas and small bowel graft hence this step should be delayed.

In the era of donor organ shortage organ procurement, surgeons are vested with great responsibility to maximize the utility of organs procured, with minimal compromise to safety. This report reiterates the limited data in the literature on feasibility of isolated pancreas graft procurement along with small bowel as a separate graft. This practice probably should be routine rather than sporadic. As the most of the donors considered for small bowel grafts are young and stable, it is essential that all steps are taken to recover transplantable quality pancreas grafts whenever an isolated bowel is procured. Engagement of dialogue with the pancreas transplant surgeon at an early part of organ procurement operation might be of helpful. Since pancreas grafts procured concurrently with isolated intestinal grafts

differ to those procured conventionally, this may facilitate the understanding between the surgeons to further improve the utility of such grafts.

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