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SURGICAL TECHNIQUE

Dissection technique for selective liver harvesting



**B. Le Roy^{a,b}, R. Memeo^b, G. Pittau^b, M. Gelli^b,
O. Ciacio^b, A. Sa Cunha^{b,*}**

^a *Service de chirurgie et oncologie digestive, CHU de Clermont-Ferrand, 63003 Clermont-Ferrand, France*

^b *Service de chirurgie hépatobiliaire, CHB Paul-Brousse, 12-14, avenue Paul-Vaillant-Couturier, 94800 Villejuif, France*

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Introduction

Liver procurement is usually performed in association with multiple organ harvesting that includes kidneys, often the heart and great vessels, and occasionally the lungs and pancreas. In principle, liver harvesting should guarantee the integrity and quality of the graft, with perfusion of the organ with an iced preservation solution through both arterial and venous routes to maintain hypothermia, and finally explantation of the liver in such a way as to avoid trauma and preserve its vascularization [1].

The original technique for liver harvesting was described by Starzl et al. [2]. In this article, we describe a four-phase harvesting technique:

- the first phase consists of preparation of the graft (Sections 1 to 5);
- the second phase consists of vascular clamping and cooling (Section 6);
- the third phase consists of the actual explantation of the graft (Section 7);
- the fourth phase consists of *ex vivo* preparation of the graft on a back table (Section 8).

The technique we describe herein differs in two ways from the Starzl technique [2]. Firstly, the arterial dissection is performed during the warm phase prior to vascular clamping; this facilitates identification of the vessels and decreases the risk of vascular injury, and it also helps to decrease the cold ischemia time, since the time required for explantation is reduced to 10–15 minutes. The second variation involves the explantation phase; the mobilization maneuver is facilitated by introduction of the fingers into the great vessels, which again reduces the risk of arterial injury and helps to protect the celiac trunk [3].

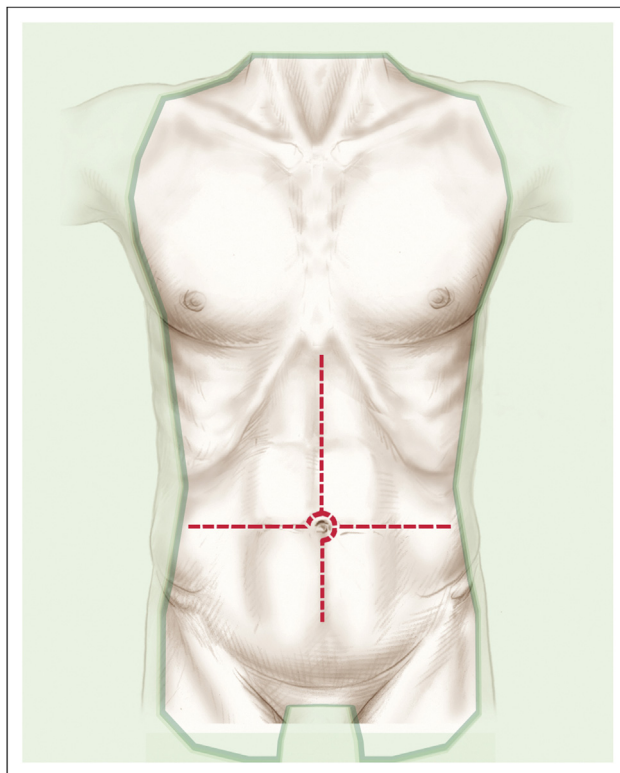
In conclusion, this slightly modified technique for liver harvesting is safer, reduces the cold ischemia time and decreases the risk of arterial injury.

* Corresponding author.

E-mail address: antonio.sacunha@pbr.aphp.fr (A. Sa Cunha).

1 Positioning and skin incision

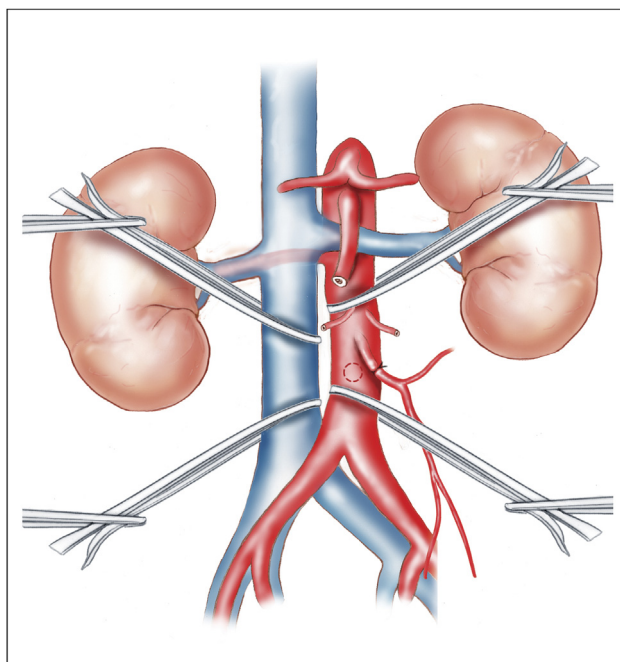
The donor is positioned supine with both arms abducted to 90 degrees. The “hepatic surgeon” stands to the donor’s right. Draping varies according to the specific organs that will be harvested. If vascular harvesting is planned, the head drapes are positioned to expose the neck below the level of the mandibles to allow harvesting of the carotid arteries while the leg drapes provide exposure down to the knees to allow harvesting of the femoral vessels. The lateral drapes are placed very low to allow a cruciform incision that is well-adapted to the harvesting of the intra-abdominal organs (kidneys, liver, \pm pancreas); a midline xiphoid-to-pubis incision is not as well-suited to liver harvesting. When the heart and lungs will also be harvested, a midline sterno-laparotomy is the preferred approach.



2 Preparation of implantation sites of the aorta and vena cava

The urologic harvesting team usually performs the dissection of the aorta and vena cava as well as placement of perfusion catheters. Mobilization of the colon from both gutters, duodeno-pancreatic mobilization and exposure of the root of the mesentery opens the approach to the retroperitoneal great vessels.

The site for aortic cannulation is 2–3 cm above the iliac bifurcation. Division of the inferior mesenteric artery between two ligatures facilitates exposure of the aorta at the site chosen for cannulation. The aorta is circumferentially dissected and encircled with two vascular tapes, taking care to avoid injury to lumbar arteries arising on its posterior surface. The site for inferior vena cava (IVC) cannulation is prepared at the same level as for the aorta. Once the IVC has been dissected circumferentially, it is encircled with two vascular tapes. Each of these guide vascular tapes is separately clamped and held in readiness for future use. The perfusion lines are prepared and flushed but are not immediately inserted.



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