



Left-side approach to the uncinate process during laparoscopic pancreaticoduodenectomy

Giuseppe Zimmitti¹, Marco Garatti¹, Antonio Iannelli^{2,3,4}, Edoardo Rosso¹

¹Department of Surgery, Istituto Fondazione Poliambulanza, Brescia, Italy; ²Université Côte d'Azur, Nice, France; ³Digestive Surgery and Liver Transplantation Unit, Centre Hospitalier Universitaire de Nice, Archet 2 Hospital, BP 3079, Nice Cedex 3, France; ⁴Inserm, U1065, Team 8 "Hepatic Complications of Obesity and Alcohol", Nice, France

Correspondence to: Edoardo Rosso, MD. Department of Surgery, Istituto Fondazione Poliambulanza, via Bissolati n°57, 25124, Brescia, Italy. Email: edoardo_rosso@hotmail.com.

Abstract: The mobilization of the uncinate process is considered a difficult step during laparoscopic pancreaticoduodenectomy. The standard approach from the right side of the superior mesenteric artery requires to apply a major tension on the mesenteric vessels to dissect the uncinate process, such tension may increase the risk of injury and massive bleeding from pancreaticoduodenal vessels. We report an original technique for the mobilization of the uncinate process from the left side of the superior mesenteric artery which combine the advantages of the laparoscopic view from the left side to a reduced tension on the mesenteric vessel for the exposure of the operating field. The left side approach allows a safe and bloodless mobilization of the uncinate process in lean patients with small uncinate process as well as in obese patients with large uncinate process.

Keywords: Laparoscopic uncinate process; laparoscopic pancreaticoduodenectomy (LPD); left side approach; pancreatic cancer

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Introduction

Laparoscopic pancreaticoduodenectomy (LPD) still be a demanding procedure, which include a complex multi-organ resection and multiple digestive anastomosis for the reconstruction. One of the most difficult steps, during the resection phase, is the mobilization of the uncinate process. This segment of the pancreas is deeply located and is connected to the superior mesenteric vein and superior mesenteric artery (SMA) via pancreaticoduodenal vessels which are extremely variable in number, size and localization (1,2). Moreover, the size of the uncinate process can be small and limited to the right and posterior borders of the SMA or can be large and reaching the left border of the SMA (*Figure 1*). The mobilization of the uncinate process during LPD adopting a standard approach from the right side of the SMA, it requires to apply a major tension on the mesenteric vessels to obtain the optimal view for

dissection, such tension may increase the risk of injury and massive bleeding from pancreaticoduodenal vessels. The videos (*Figures 2,3*) report in details an alternative technique approaching the uncinate process from the left side of the SMA (5), such technique allows to avoid excessive tension on the mesenteric vessels and can be adopted either for small or large uncinate process.

Case presentation

We report two cases of male patients having resectable adenocarcinoma of the head of the pancreas. The body mass index (BMI) were 26 and 32 kg/m², respectively. Both patients underwent full LPD with a left side approach to the uncinate process accordingly to the following described technique. The patient is placed in the supine position with the legs in abduction. The pneumoperitoneum is induced at a pressure of 12 mmHg using a Hasson's technique in peri-

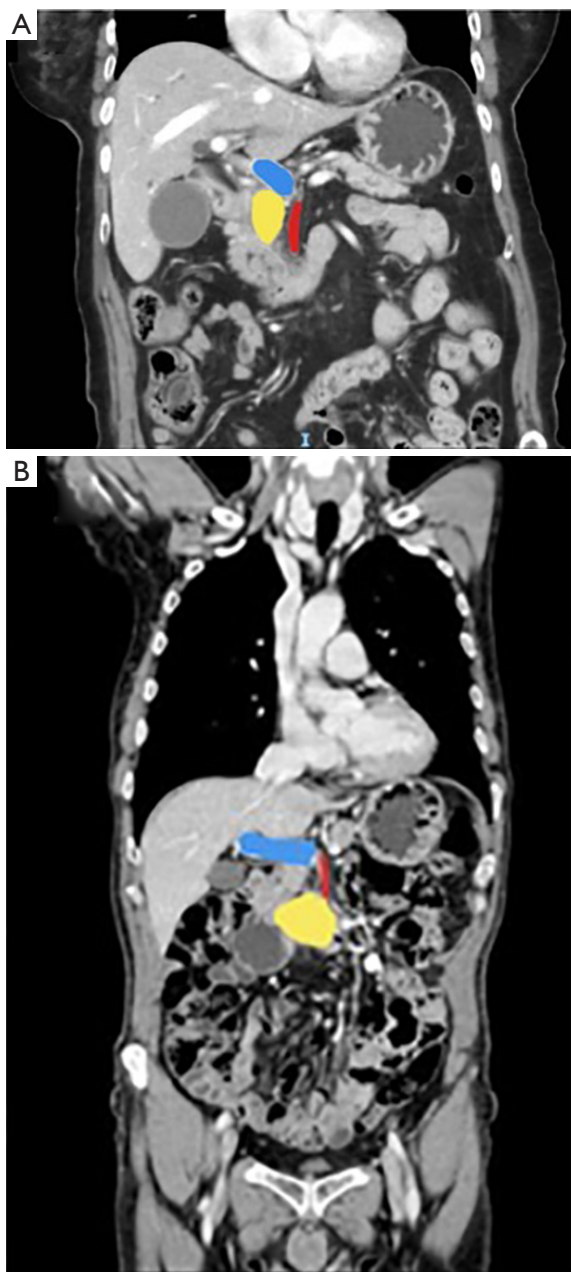


Figure 1 Pre-operative abdominal CT scan. (A) CT scan of a small uncinate process; (B) CT scan of a large uncinate process. In yellow the uncinate process; in blue the portal vein; in red the superior mesenteric artery. CT, computed tomography.

umbilical area, the remaining trocars are inserted under direct vision, two 10–12-mm trocars on both sides of the first one, a 5-mm trocars on both flanks and one 10-mm trocar for the smoke-suction system (AirSeal®) in subxifoid area. The position of the surgeon follows that of the optical



Figure 2 The left-side approach to small size uncinate process during laparoscopic pancreaticoduodenectomy (3). Available online: <http://www.asvide.com/watch/32991>



Figure 3 The left-side approach to large size uncinate process during laparoscopic pancreaticoduodenectomy (4). Available online: <http://www.asvide.com/watch/32993>

camera and depend on the stage of the procedure, in between the legs for the initial steps of the operation, on the left side during the mobilization of the uncinate process, and finally on the right side during the resection of the retroportal lamina. We used 3D flexible laparoscope. After division of the first jejunal loop at the Treitz ligament the small bowel is pulled toward the left and SMA axis toward the legs, the uncinate process is identified from the SMA with a combination of not resorbable clips and ultrasonic coagulation. In case the inferior pancreaticoduodenal artery originates from the posterior border of the SMA it is sutured, clipped and divided (*Figure 4*). The mobilization of the uncinate process is pursued from the left to the right as far as possible then the small bowel is transposed on the right and the mobilization of the uncinate process is

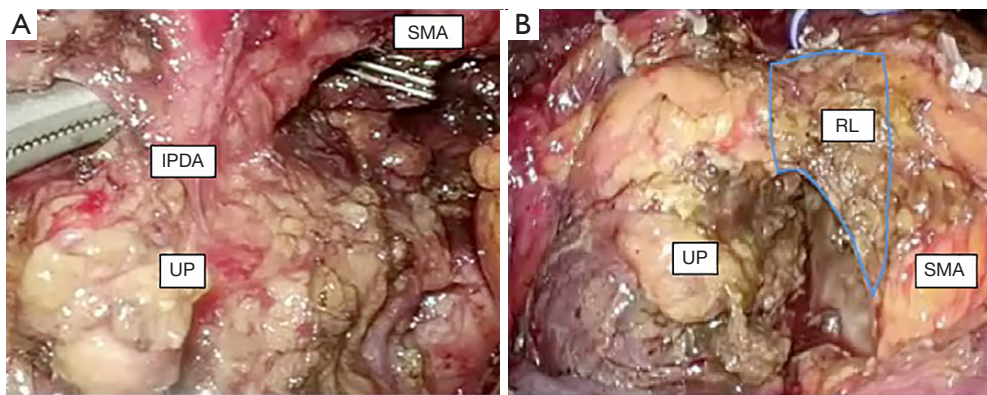


Figure 4 Intra-operative views of the uncinata process before mobilization on and after complete mobilization. (A) Large uncinata process, view from the left; (B) large uncinata process completely mobilized, view from the right. SMA, superior mesenteric artery; IPDA, inferior pancreaticoduodenal artery; UP, uncinata process; RL, retroportal lamina.

achieved by dividing the Henle truck and the remaining attachment to the mesenteric vessel. At this point of the operation to complete the resection phase it remains only to divide the retro-portal lamina following the right border of the SMA (Figure 4). Operative duration was 390 and 410 minutes, respectively without intraoperative bleeding.

Discussion

We reported an original technique to achieve a safe and bloodless mobilization of the uncinata process during LPD adopting a left side approach. Indeed, positioning the optical camera on the left side of the patient allows an optimal view on the left border of the SMA, and after having divided the first jejunal loop, the uncinata process becomes clearly visible and can be dissected from the SMA without exerting any excessive traction on the mesenteric vessels which can be at the origin of massive bleeding during the classical right side approach. We have shown that the left side approach is feasible not only in case of lean patient with small uncinata process but also in obese patient with large uncinata process; which constitute a major advantage in comparison with right side approach that is particularly difficult in obese patients. Finally, the left side approach allows to remove in all cases completely the uncinata process avoiding partial resection that can be associated with right side approach in obese patient.

In conclusion the left side approach to the uncinata process during LPS should be considered an alternative to the classical right-side approach and added to the armamentarium of pancreatic surgeon.

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Footnote

Conflicts of Interest: The authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/ls.2019.09.08>). ER serves as an unpaid editorial board member of *Laparoscopic Surgery* from October 2019 to September 2021. The other authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Declaration of Helsinki (as revised in 2013). Written informed consent was obtained from the patient for publication of this manuscript and any accompanying images.

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