AG-2022-1
doi.org/10.1590/S0004-2803.202202000-57

Combined "hanging liver maneuver" and "intrahepatic extra-Glissonian approach" for anatomical right hepatectomy: technique standardization (video)

Fabio Ferrari **MAKDISSI**, Gilton Marques **FONSECA**, Jaime Arthur Pirola **KRUGER**, Vagner Birk **JEISMANN**, Fabricio Ferreira **COELHO** and Paulo **HERMAN**

Received: 3 January 2022
Accepted: 21 March 2022

Liver resection is the main treatment for liver malignances. Bleeding is one of the primary risks throughout hepatectomies. Many technical strategies have been described to increase safety during these procedures. The "hanging liver maneuver"[1] and "intrahepatic extra-Glissonian approach"[2] are different modalities that can be combined to facilitate anatomical right hepatectomies[3].

The hanging liver maneuver comprises passing a tape or a rubber tube between the anterior surface of the retro-hepatic vena cava and the posterior surface of the liver. Upwards traction on the rubber tube allows the liver to be suspended, acting as a guide to a linear anatomic hepatic parenchymal transection, helping to control bleeding and eliminating the need for a wide mobilization of the right liver[1].

The intrahepatic extra-Glissonian approach is a strategy for rapid access and control of the main Glissonian pedicles within the liver, without the need of time-consuming pedicle components dissection[2]. The basis and anatomical landmarks for intrahepatic Glissonian pedicle access to right liver segments are described elsewhere[2]. An instrument for liver pedicle retrieval was later designed, allowing an atraumatic intrahepatic extra-Glissonian pedicle isolation in a soft and gentle maneuver, preventing rupture of intrahepatic structures[4]. Once isolated, the Glissonian pedicle can be clamped, leading to an ischemic delineation for anatomical liver resection, making dispensable the total clamping blood inflow control (Pringle maneuver) during liver transection, allowing maintenance of perfusion to the future liver remnant. A main concern related to this technique during right hepatectomies is the risk of extended contralateral pedicle clamping, leading to the injury of the left bile duct after right pedicle ligation or stapling[5]. In the technique hereby applied (E-VIDEO), the section of the right pedicle is left to a late stage of the surgery, after the complete transection of the hepatic parenchyma, allowing the complete exposure of the entire right Glissonian pedicle before ligation or stapling[3].

Technical standardizations are upmost to increase the safety of surgical procedures. This may be especially important in academic teaching hospitals. The combination of "hanging liver maneuver" and the "intrahepatic extra-Glissonian approach" for anatomical right hepatectomy has been standardized and used for the treatment of oncological patients at our institution, a tertiary teaching hospital with a training program in hepatobiliary surgery[3].

Orcid

Fabio Ferrari Makdissi: 0000-0001-8202-5890.
Gilton Marques Fonseca: 0000-0002-7260-0799.
Jaime Arthur Pirola Kruger: 0000-0002-0169-4927.
Vagner Birk Jeismann: 0000-0003-3785-1960.
Fabricio Ferreira Coelho: 0000-0002-5290-8286.
Paulo Herman: 0000-0003-2859-5846.

Declared conflict of interest of all authors: none
Disclosure of funding: no funding received
Hospital das Clínicas (HCFMUSP), Faculdade de Medicina, Universidade de São Paulo, Divisão de Cirurgia do Aparelho Digestivo, Departamento de Gastroenterologia, São Paulo, SP, Brasil.
Corresponding author: Fabio Ferrari Makdissi. E-mail: ffmakdissi@gmail.com
E-VIDEO: https://youtu.be/kGil17DDXrY

Makdissi FF, Fonseca GM, Kruger JAP, Jeismann VB, Coelho FF, Herman P. Associação da manobra de *"hanging liver*" e "acesso intra-hepático extra-glissoniano" para hepatectomia direita anatômica: padronização de técnica (vídeo). Arq Gastroenterol. 2022;59(2):319-20.
Keywords: Hepatectomy, Hanging liver maneuver, Intrahepatic glissonian approach.

REFERENCES

1. Belghiti J, Guevara OA, Noun R, Saldinger PF, Kianmanesh R. Liver hanging maneuver: a safe approach to right hepatectomy without liver mobilization. J Am Coll Surg. 2001;193:109-11. doi:10.1016/s1072-7515(01)00909-7
2. Machado MA, Herman P, Machado MC. A standardized technique for right segmental liver resections. Arch Surg. 2003;138:918-20. doi:10.1001/archsurg.138.8.918
3. Makdissi FF, de Mattos BVH, Kruger JAP, Jeismann VB, Coelho FF, Herman P. A Combined "Hanging Liver Maneuver" and "Intrahepatic Extra-Glissonian Approach" for Anatomical Right Hepatectomy: Technique Standardization, Results, and Correlation With Portal Pedicle Anatomy. Front Surg. 2021;8:690408. doi: 10.3389/fsurg.2021.690408.
4. Makdissi FF, Machado MA, Surjan RC. A new instrument for intrahepatic access of Glissonian pedicles during anatomical liver resections. Surg Innov. 2014;21:350-4. doi:10.1177/1553350613505716
5. Moris D, Rahnemai-Azar AA, Tsilimigras DI, Ntanasis-Stathopoulos I, Marques HP, Spartalis E, et al. Updates and Critical Insights on Glissonian Approach in Liver Surgery. J Gastrointest Surg. 2018;22:154-63. doi:10.1007/s11605-017-3613-9