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GUEST EDITORIAL

Real usefulness of the technological devices in open and laparoscopic hepatic resections

Hepatic surgery is a relatively new surgical specialty. The first right hepatectomy was performed in 1950 by Lortat Jacob JL in Paris and the results were published two years later [1]. The first right hepatectomy by laparoscopy was performed in 1994 by Huscher C [2].

From 1952 to 1980, there were only a few centers established in this field of surgery worldwide and liver surgeons remained limited to these centers. In this period, surgeons performing hepatic surgery were able to reach an excellent level of skill, an achievement that permitted obtaining a mortality of 3% or lower.

From 1980, the spreading use of ultrasonography permitted diagnosis of an increasing number of liver diseases suitable for surgery. As a consequence of this, hepatic resection became very popular and many general surgeons in the world started to perform it.

In the first part of the 1990s, a laparoscopic approach began to be used for hepatic surgery. This new method needed to be learn not only by neophytes in hepatic surgery but also by experienced liver surgeons. This represented a new challenge in a field that had achieved such success in previous decades.

The major factor affecting mortality of patients submitted to hepatic resection is bleeding, and the major source of bleeding in hepatic surgery is the surface of the liver being cut during hepatic transection. From 1980 onwards an increasing number of devices have been developed to permit safe hepatic surgery, as shown by publications cited in PubMed. In fact using the key term "liver resection" and the option research "limit" we obtained 127 articles from 1970 to 1979, 197 articles from 1980 to 1989, 517 from 1990 to 1999, and 826 from 2000 to 2007; many of the manuscripts published in the last two periods were about different devices useable for liver surgery.

The first publication about a technological device applied for liver resection appeared in 1983 [3] and concerned an "ultrasonic dissector"; another publication about this device was published in 1984 [4]; and a third publication was a prospective study, which started in 1979 and was published in 1985, about the Nd-YAG laser for liver resection [5]. All these publications focused on the importance of reducing bleeding during liver surgery, to minimize parenchymal damage and so make liver resection safer.

Since that period a lot of devices were developed that exploited many different technologies. The development of these devices had the objective of making liver resections safer and allowed even more surgeons to practice liver surgery. The increasing number of liver surgeons attracted the economic interest of industry to liver surgery and brought continuing introductions of new and even more sophisticated technological devices to the market.

Moreover, laparoscopy represents a new impetus for the development of these devices. In fact, in contrast to open liver surgery that can be performed only with a simple Kelly forceps, the use of technological devices that coagulate and/or resect liver parenchyma is mandatory for laparoscopic liver surgery.

Devices for liver transection can be divided into three groups by considering their different mechanisms of action on liver tissue: instruments that perform dissection with a blunt trauma on liver parenchyma; instruments that cause coagulation of liver tissue by electric energy; and stapling systems.

In this issue of HPB, dedicated to technological devices used for parenchymal transection, the real utility of these devices is investigated. This series of manuscripts represents a unique collection of articles about this field and can help to better understand the usefulness and the necessity of each device in open and laparoscopic surgery. Each author has precisely illustrated the nature of a device, its applications, and the results related to their personal casuistic and to the data presented in the literature.

Whereas the fundamental steps of hepatic surgery remain the knowledge of anatomy, intraoperative ultrasound, and low central venous pressure anesthesia, until now the only mandatory device considered for hepatic parenchymal transection in open surgery has been the very economical and widely used Kelly clamp. Clamp crushing permits performing hepatic resection, but many of the described technological devices may allow avoiding clamping of the liver and reducing blood loss and ischemia–reperfusion effect. In this way if they contribute to reducing morbidity and mortality, even if they are not mandatory, they

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can be recommended. Still, particular attention should be dedicated to intraoperative biliostasis in order to avoid high rates of postoperative biliary fistula, and the use of each device depends on the choice of the individual surgeon.

The situation for hepatic resection performed by laparoscopy is different. Hemostasis itself is improved by tamponading of the cut surface by the pneumoperitoneum. However, a technological device is mandatory, and none of these devices can permit hepatic transection alone. Usually, performing laparoscopic hepatic parenchymal transection requires two or more instruments. The technological research should focus on the development of a single device that can be used for the duration of a liver resection to minimize costs and time and to increase safety.

Finally, let me express to all the authors my deep appreciation for their outstanding contributions to this issue. They are part of excellent departments of hepatic surgery and represent a guiding light of reference for liver surgery.

Last but not least, I sincerely thank the Editor-in-Chief for permitting me to contribute this Editorial.

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References

[1] Lortat-Jacob JL, Robert HG, Henry C. Case of right segmental hepatectomy. Mem Acad Chir (Paris) 1952;78:244–51.
[2] Huscher C, Lirici MM, Chiodini S. Laparoscopic liver resections. Semin Laparosc Surg 1998;5:204–10.
[3] Putnam CW. Techniques of ultrasonic dissection in resection of the liver. Surg Gynecol Obstet 1983;157:474–8.
[4] Hodgson WJ, Del Guercio LR. Preliminary experience in liver surgery using the ultrasonic scalpel. Surgery 1984;95:230–4.
[5] Iwasaki M, Sasako M, Konishi T, Maruyama Y, Wada T. Nd-YAG laser for general surgery. Lasers Surg Med 1985;5: 429–38.