The Journey of Liver Surgery and Future Perspectives

Prof. Bjørn Edwin[1,2], MD, PhD
[1]*Dep. for HPB surgery, Oslo University hospital*
[2]*Institute of Clinical Medicine, Oslo University, Oslo, Norway*
E-mail: bjoedw@ous-hf.no
Gastroenterolog 2023; suplement 1: 49–50

ABSTRACT

Liver surgery has undergone a remarkable evolution, marked by the contributions of pioneering surgeons, advancements in surgical techniques, and the integration of innovative technologies. This abstract delves into the historical development of liver surgery, its anatomical intricacies, surgical innovations, and its promising future horizons. The exploration begins with an introduction to liver anatomy, emphasizing the groundbreaking work of Claude Couinaud, who classified the liver into distinct segments based on portal blood distribution.

The emergence of liver tumors, both benign and malignant, has spurred the need for effective surgical interventions. Various types of liver resections are discussed, ranging from formal anatomical resection, anatomical segmentectomies to atypical resections. The Brisbane 2000 Terminology of Liver Anatomy and Resections serves as a framework for understanding liver surgery nomenclature. Notably, the liver's regenerative capacity enables the removal of up to 70% of its mass without compromising its essential functions.

Key innovations that have facilitated successful elective abdominal operations are highlighted. These include the introduction of anesthesia by Morton in 1846, Pasteur's discovery of microorganisms causing diseases, Lister's development of antisepsis in 1867, and the utilization of Paquelin's Thermo-Cautery. Sterilization through steam, pioneered by Von Bergmann in 1886, revolutionized surgical practices. The presentation also chronicles significant historical milestones, such as German surgeon Carl Johann August Langenbuch's first successful hepatic resection in 1888 and subsequent resections of metastatic liver cancers by Bruns and hemangiomas by von Eiselberg.

Hemorrhage emerged as a major challenge in early liver surgeries, with techniques like Pringle's Maneuver being developed to achieve hemostasis. A multicenter analysis from 1977 underscored the operative mortality rates associated with hepatic resections, prompting further refinement of techniques. The concept of Future Liver Remnant (FLR) gained prominence, emphasizing the importance of preserving adequate liver function after resection. The 1980s and 1990s marked a period of acceptance for liver surgery, driven by improved anatomical understanding and advancements in anesthetic care, transection techniques, and hemostatic methods.

A paradigm shift occurred with the advent of minimally invasive surgery, particularly laparoscopy, which earned recognition as "patient-friendly surgery." The presentation elucidates various surgical approaches, including open, minimally invasive, and parenchyma-sparing techniques. Multimodal treatment strategies, combining surgery with other therapeutic modalities, gained traction, requiring robust evidence through frameworks like IDEAL (Idea, Development, Exploration, Assessment, Long-term follow-up).

The presentation underscores the significance of evidence-based practice in liver surgery, highlighting the importance of matched series, systematic reviews, meta-analyses, and randomized controlled trials. European guidelines provide a comprehensive framework for standardizing liver surgical practices. As the field looks to the future, the abstract anticipates the integration of value-based healthcare, the fusion of medicine with technology, and the role of robotics, navigation technologies, and hybrid operating rooms. The potential of localized ablation of liver tumors, the transformative power of big medical data, and the advent of personalized cancer treatments also shape the landscape of liver surgery.

In conclusion, this presentation encapsulates the journey of liver surgery from historical breakthroughs to modern advancements and envisions its promising future. It underscores the importance of interdisciplinary collaboration, evidence-based practice, and the harmonious amalgamation of surgical expertise with cutting-edge technology as the catalysts for continued success in liver surgery.