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# Editorial on the Special Topic: Advances in Surgical Techniques for Liver Tumors

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Liver surgery - once defined by the magnitude of open incisions, heroic exposures, and unforgiving learning curves - has entered a decisive new chapter. The convergence of technology, refined technique, and collective wisdom has begun to redraw the boundaries of what is possible for patients with hepatobiliary malignancies. It is within this vibrant landscape that we present this Special Issue of *Mini-invasive Surgery*, dedicated to "Advances in Surgical Techniques for Liver Tumors".

As minimally invasive liver surgery matured from curiosity to global standard, our field has learned that innovation is not merely the invention of new tools - it is the disciplined refinement of decision-making, the pursuit of precision, and the courage to rethink long-held assumptions. Today, laparoscopy, robotics, fluorescence imaging, AI, and 3D-simulated navigation coexist to reshape the liver surgeon's craft. What previously required extensive mobilization can now be achieved through caudal approaches that preserve the rib cage's natural protection. What once demanded tactile feedback is increasingly supported by augmented imaging, machine-learning-assisted interpretation, and high-fidelity anatomical reconstructions that guide the surgeon's hand.

This issue brings together work that not only documents progress - it illuminates the mindset enabling it.

## REFINING TECHNIQUE: PRECISION THROUGH RESTRAINT

Acidi *et al.* showcase an evolving philosophy in robotic liver resection for colorectal metastases: parenchymal preservation as a strategic advantage, not merely a technical achievement[1]. Their emphasis on tailored portal control, thoughtful anesthetic modulation, and ICG-guided precision represents the maturity of a craft that now blends art and engineering in the operating room.

Similarly, Morise's reflections[2] on minimally invasive redo surgery reveal the quiet revolution brought about by the caudal approach, simulation, and navigation - a



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philosophy that minimizes tissue injury while maximizing oncologic and functional outcomes. This perspective reframes "redo surgery" from a dreaded challenge into a solvable, navigable domain when guided by image-based strategy and restraint.

## EVIDENCE FOR BETTER OUTCOMES

In this issue, Maeda *et al.* offer compelling data affirming that minimally invasive anatomical hepatectomy reduces incisional surgical site infections while decreasing transfusions, blood loss, and hospital stay - all without compromising oncologic results[3]. The message is clear: minimally invasive anatomical resection is not simply equivalent to open surgery - it can be safer for patients when executed by trained teams using structured criteria.

## THE TECHNOLOGICAL HORIZON

AI-enhanced navigation, augmented reality overlays, and 3D-printed liver models are no longer speculative aspirations; they are rapidly becoming indispensable extensions of the hepatobiliary surgeon's cognition. Chatzikomnitsa *et al.* illuminate how AI-driven segmentation, biomechanical modeling, and real-time augmented guidance promise to reduce human error and enhance intraoperative decision-making[4]. As robotics integrates with these technologies, our future operating rooms may well evolve into intelligent ecosystems that elevate both safety and mastery.

## WHEN INNOVATION IS BORN OF CONSTRAINT: RECLAIMING ERGONOMICS IN HIGH-DIFFICULTY ROBOTIC SURGERY

The fifth contribution in this Special Issue shifts the lens from advanced platforms to adaptive ingenuity at the operating table. This article demonstrates how innovation does not always arrive as new hardware. A simple Fr 12 nasogastric tube, introduced through a superior epigastric port and stabilized by a robotic arm, is repurposed into a flexible, surgeon-controlled suction device capable of CUSA-like sweeping in the hepatic dome. Integrated with intraoperative ultrasound, ICG demarcation, and an "expose-and-clip" pedicle strategy, this technique restores ergonomic control precisely where conventional instrumentation fails[5].

Beyond its technical description, this contribution underscores a broader message that resonates across this Special Issue: progress in minimally invasive liver surgery is not solely defined by access to technology, but by the capacity to adapt, simplify, and re-engineer solutions when constraints arise. In an era increasingly guided by difficulty scores and outcome metrics, it reminds us that real-world mastery often emerges at the intersection of experience, creativity, and restraint.

## THE FUTURE WE ARE BUILDING

Taken together, these contributions embody a truth that has guided our specialty from the beginning: progress in liver surgery is never linear. It is a rhythmic cycle of courage and caution, innovation and introspection, vision and evidence.

Across Asia, Europe, and the Americas, we are witnessing the emergence of a shared philosophy - one that embraces:

- precision over magnitude,
- parenchymal preservation over radicality whenever oncologically sound,
- navigation over aggressive exposure,
- team-based mastery over individual heroics, and
- technology as partner, not replacement.

This issue stands not only as a collection of papers, but also as a quiet manifesto for the next decade of hepatobiliary surgery: a decade where minimally invasive approaches continue to democratize safe liver surgery, where robotics becomes not a luxury but a standard, and where intelligent systems empower surgeons to extend lives with greater safety, accuracy, and compassion.

To the authors, reviewers, and global community who contributed to this endeavor - thank you. Your work advances more than technique; it advances hope. And to every surgeon reading this issue, may these pages offer both knowledge and inspiration, lighting the way forward as we continue to push the boundaries of what can be achieved for patients with liver tumors.

## DECLARATIONS

### Authors' contributions

The author contributed solely to the article.

### Availability of data and materials

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### AI and AI-assisted tools statement

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### Conflicts of interest

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### Ethical approval and consent to participate

Not applicable.

### Consent for publication

Not applicable.



## REFERENCES

1. Acidi B, Haddad A, Tran Cao HS. Tips and tricks for the robotic-assisted approach to colorectal cancer liver metastases. *Mini-invasive Surg.* 2024;8:33. DOI
2. Morise Z. Current status and future perspectives of minimally-invasive redo liver surgery - what can we add with technologies of simulation/navigation and robot? *Mini-invasive Surg.* 2024;8:34. DOI
3. Maeda T, Ito Y, Hosaka H, et al. Does minimally invasive anatomical hepatectomy reduce surgical site infections? *Mini-invasive Surg.* 2025;9:2. DOI
4. Chatzikomnitsa P, Gkaitatzi AD, Papakonstantinou M, et al. The role of artificial intelligence and 3D printing in minimally invasive liver surgery. *Mini-invasive Surg.* 2025;9:8. DOI
5. Teh CSC, Ong KG, Casupang MAJ. Overcoming instrumentation limitations in robotic anatomic segment VIII resection. *Mini-invasive Surg.* 2026;10:21. DOI