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Editorial

Thoracic Surgery Personalized Medicine: The Function And Prospects Of Robotic-Assisted Methods.

Takshi Egchi.

Department of Gastric Surgery, Sun Yat-sen University, China.

INTRODUCTION

The area of thoracic surgery has undergone a revolution with the introduction of robotic-assisted thoracic surgery (RATS), which presents a new paradigm for precision, tailored, and personalized medicine. The special qualities of RATS, such as improved agility, accuracy, and visualization, provide a more customized strategy to meet the unique requirements of every patient. In the treatment of thoracic cancers, where surgery can have a major impact on patient outcomes, this individualized approach is especially pertinent [1].The role of RATS is anticipated to grow as precision medicine continues to progress, providing patients with thoracic malignancies with more individualized and ideal therapy options.With an emphasis on RATS's function in personalized medicine, this presentation will examine the technology's present state and potential future developments.

A novel robotic method for customized lung excision

Segmentectomy, a novel method of robotic lung excision, is reported by Sakakura et al. [2]. Presenting a three-arm robotic open-thoracotomy-view technique, the authors describe the system configuration, port locations, and the functions of two assistants and confronting monitors in this method. They stress that the console surgeon and the two assistants may see the same views as they would normally have during open-thoracotomy procedures thanks to the clear visualization of cranial-side intrathoracic structures, which are frequently obscured by the traditional look-up-view strategy. With improved accuracy and visualization, this strategy might be a workable substitute for conventional techniques.

Adapting RATS to various mediastinal tumor environments

The second publication by Okazaki et al. explores the advantages of RATS for various kinds of mediastinal cancers, expanding on the idea of customized surgical techniques. including mediastinal malignancies in the anterior, superior, middle, and posterior regions [3]. The authors stress that the size, location, and aggressiveness of the tumor should all be taken into consideration when choosing the position and port placement.

The use of RATS to treat dumbbell tumors—which call for a posterior approach and can be carried out in the prone position—is also covered in the paper.According to the authors, RATS's prescription for mediastinal malignancies may be further expanded As robots advance, the significance of customized medicine in identifying the best surgical strategy for every patient is highlighted.

Using RATS to improve lung segmentectomy results

The significance of customized surgery in the age of precision medicine is emphasized in the third paper. When discussing the application of RATS in lung segmentectomy, Eguchi et al. emphasize how its fundamental technology can enhance operating performance.characteristics [4]. The authors talk about the difficulties associated with lung segmentectomy, specifically the requirement for intraoperative navigation and preoperative planning based on the topographic anatomy of each segment.

According to them, the RATS technique has an edge in terms of achieving superior surgical visualization because of the consistent retraction with its helper arm and the magnified visualization with its binocular scope system. The writers

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highlight the value of customized surgery in precision medicine, adjusting the surgical strategy for each patient according to their unique lung tumor oncological characteristics, humoral anatomy, functional history, and surgical tolerance. Additionally, highlight how RATS can improve patient outcomes by implementing customized surgical techniques.

Development of robotic port positioning for customized surgery

From the first stage of simulating video-assisted thoracic surgery (VATS) to the fourth stage of port placement changes, Sakakura and Eguchi talk about optimizing the da Vinci Xi robotic system's functional features [5]. They draw attention to the developments of the da Vinci Xi system, such as the addition of the robotic stapler and the enhanced latitude of robotic arms due to less external arm collision and more port placement flexibility.

This development demonstrates how flexible RATS is and how it can be further customized to meet the specific requirements of each patient as well as the surgeon's preferences. The writers stress the value of thoracic surgeons in their conclusion.

being well-versed in different methods to select the most appropriate one, so enhancing the function of individualized treatment in RATS.

Better noncancer results with RATS in the treatment of lung cancer

In their last study, Zhang et al. compare open thoracotomy with RATS in the treatment of non-small cell lung cancer [6]. The authors emphasize the viability of and security of the RATS method, which provides ergonomic benefits, improved precision, and three-dimensional visibility. In their meta-analysis, they confirm that robotic resections have better perioperative results than open thoracotomy, including a higher number of lymph node stations extracted and a lower frequency of atrial arrhythmias.

This study emphasizes how RATS can improve patient outcomes by using tailored surgical techniques, hence highlighting RATS's significance in the age of precision medicine. The authors recommend that additional advancements in robotics platform, as well as increased pricing and accessibility, will support the consolidation of its function in the surgical treatment of lung cancer.

Future Perspectives

RATS has a bright future in thoracic surgery, since continued developments are anticipated to improve the accuracy and customization of surgical procedures. We expect more advancements in surgical results as technology develops. patient recuperation and general well-being. By enabling more precise preoperative planning, intraoperative navigation, and postoperative monitoring, the use of AI and machine learning into RATS may also present new prospects for customized treatment.The usefulness of RATS in offering individualized and ideal treatment for thoracic malignancies is anticipated to grow in importance as we proceed in this fascinating era of precision medicine.

REFERENCES

1. Hristov, B.; Eguchi, T.; Bains, S.; Dycoco, J.; Tan, K.S.; Isbell, J.M.; Park, B.J.; Jones, D.R.; Adusumilli, P.S. Adusumilli, Minimally Invasive Lobectomy Is Associated With Lower Noncancer-specific Mortality in Elderly Patients: A Propensity Score Matched Competing Risks Analysis. Ann. Surg. 2019, 270, 1161–1169. [CrossRef] [PubMed].

2. Sakakura, N.; Nakada, T.; Takahashi, Y.; Suzuki, A.; Shinohara, S.; Kuroda, H. Three-Arm Robotic Lung Resection via the OpenThoracotomy-View Approach Using Vertical Port Placement and Confronting Monitor Setting: Focusing on Segmentectomy. J. Pers. Med. 2022, 12, 1771. [CrossRef] [PubMed].

3. Okazaki, M.; Shien, K.; Suzawa, K.; Sugimoto, S.; Toyooka, S. Robotic Mediastinal Tumor Resections: Position and Port Placement. J. Pers. Med. 2022, 12, 1195. [CrossRef] [PubMed].

4. Eguchi, T.; Miura, K.; Hamanaka, K.; Shimizu, K. Adoption of Robotic Core Technology in Minimally Invasive Lung Segmentectomy: Review. J. Pers. Med. 2022, 12, 1417. [CrossRef] [PubMed].

5. Sakakura, N.; Eguchi, T. Port Placement Variations for Robotic Lung Resection: Focusing on Their History, Conventional Look-Up-View and Horizontal Open-Thoracotomy-View Techniques, and More. J. Pers. Med. 2023, 13, 230. [CrossRef] [PubMed].

6. Zhang, O.; Alzul, R.; Carelli, M.; Melfi, F.; Tian, D.; Cao, C. Complications of Robotic Video-Assisted Thoracoscopic Surgery Compared to Open Thoracotomy for Resectable Non-Small Cell Lung Cancer. J. Pers. Med. 2022, 12, 1311. [CrossRef] [PubMed].