



What is the role of surgical oncologist in the treatment of gastric cancer?

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Surgical oncologist plays a pivotal role in treating patients with cancer in the era of precision medicine. In this article, we summarized traditional roles of surgical oncologists and suggested further additional ones for the modern day in the multidisciplinary approach to gastric cancer treatment.

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INTRODUCTION

In recent circumstances, the multidisciplinary approach for the gastric cancer patient yields better oncological outcomes compared to a single treatment, including surgical or medical treatment alone. In the era of precision medicine, where treatment is tailored to each patient, a multidisciplinary approach is an indispensable prerequisite for gastric cancer treatment. In a multidisciplinary approach, the surgical oncologist is an essential member of the cancer treatment team, playing a critical role in the diagnosis and management of gastric cancer.

Surgical oncologist has been defined as a surgeon who has acquired special skills and expertise and has made a commit-

ment to treating patients who have neoplasms [1,2]. Surgical oncologists go beyond simply treating patients diagnosed with cancer and provide a body of knowledge that extends to all factors of cancer, including prevention, diagnosis, treatment, rehabilitation, and surveillance [1,2]. The best summary of surgical oncologist characteristics was described about 30 years ago by the editors of the *Annals of Surgical Oncology* [1,2], and is still valid for 21st-century surgical oncologists and is regarded as must-have traits for candidates who wish to become surgical oncologists.

SUMMARY OF SURGICAL ONCOLOGIST CHARACTERISTICS

Fourteen characteristics are suggested in the Editorial of the *Annals of Surgical Oncology* [1,2]. These traits could be classified into three aspects. First, the surgical oncologist himself. As a competent technical surgeon and a skilled oncologist with extensive knowledge, he or she primarily cares for cancer patients. Surgical oncologist manages complex and unusual presentations of cancer involving a diverse number of anatomic sites and suggests optimal surgical treatment option. The surgical oncologist provides leadership in a multidisciplinary team. To fulfill this role, surgical oncologists need additional training, such as a fellowship. Second, relationship with patients. Surgical oncologist takes care of the patient's life after treatment such as rehabilitation and detecting recurrences and second primaries. Third, education for physicians. The surgical oncologist provides educational leadership to the community's physicians and to the next generation of physicians.

ADDITIONAL ROLES FOR SURGICAL ONCOLOGISTS IN THE TREATMENT OF GASTRIC CANCER

In addition to the roles of the surgical oncologist outlined above, additional roles are required at this time. The first thing to emphasize is the design of a well-organized clinical trial. There have been various pivotal trials in the history of gastric cancer diagnosis and treatment. The representative excellent clinical trials for gastric cancer are as follows: MAGIC trial evaluating the role of perioperative chemotherapy [3], ACTSGC trial evaluating the efficacy of adjuvant TS-1 chemotherapy [4], JCOG9501 trial comparing D2 lymphadenectomy alone or with paraaortic nodal dissection for advanced gastric cancer [5], ToGA trial evaluating the efficacy of trastuzumab for Her2-positive advanced gastric cancer [6], CLASSIC trial evaluating the efficacy of adjuvant capecitabine and oxaliplatin chemotherapy [7], ARTIST trial evaluating the efficacy of perioperative chemoradiotherapy [8], and REGATTA trial evaluating the role of debulking gastrectomy followed by chemotherapy for stage IV gastric cancer [9]. Recently, KLASS trial series conducted by the Korean Laparoendoscopic Gastrointestinal Surgery Study Group (KLASS) are underway to evaluate the efficacy of laparoscopic approach for gastric cancer. KLASS-01 study confirmed laparoscopic distal gastrectomy as a standard procedure of choice for early gastric cancer located in the distal

to middle portion of the stomach [10]. KLASS-02 study confirmed laparoscopic distal gastrectomy as a recommended procedure for advanced gastric cancer located in the distal to middle portion of the stomach [11]. KLASS-03 study showed the safety of laparoscopic total gastrectomy in patients with early gastric cancer located in the upper body of the stomach [12]. KLASS-04 study reported comparable postoperative complications and mortality in laparoscopic pylorus-preserving gastrectomy compared with laparoscopic distal gastrectomy [13]. KLASS-05 study documented comparable short-term outcomes of laparoscopic proximal gastrectomy with double-tract reconstruction compared with laparoscopic total gastrectomy [14]. Other KLASS trials are actively underway.

In addition to designing clinical trials, surgical oncologists are familiar with the surgical techniques and procedures used to treat cancer and can provide valuable insights into how these procedures can be optimized and standardized in the context of a clinical trial. Since surgery is the first treatment option for stage II to III gastric cancer and some stage I patients, surgical oncologists have no choice but to play an important role in clinical trials related to these patients [15]. Even for stage I gastric cancer patients indicated for endoscopic resection; the role of a surgical oncologist is necessary because additional gastrectomy is required for non-curative resection after endoscopic submucosal dissection [15]. For patients with stage IV gastric cancer, palliative chemotherapy is required. The role of the surgical oncologist in clinical trials for these patients is also important because many surgical oncologists directly perform chemotherapy, and a conversion surgery is sometimes necessary for curative treatment after chemotherapy.

The second thing to emphasize as an additional role of the surgical oncologist is to make guidelines. As specialists in the surgical management of cancer, surgical oncologists are frequently involved in the development of guidelines related to surgical procedures and techniques for various types of cancer. They may contribute to the guideline development process through participation in guideline development panels, reviewing and providing feedback on draft guidelines, and presenting or publishing research related to the surgical management of cancer. Surgical oncologists also play a key role in the implementation of guidelines in clinical practice. They may use guidelines as a framework for decision-making in the diagnosis and treatment of their patients and help educate other healthcare professionals on the recommended best practices for the surgical management of cancer. Finally, surgical oncologists may contribute to the refinement and update of guidelines over time.

As new evidence emerges, guidelines may need to be updated to reflect changes in the recommended practices for the surgical management of cancer. Surgical oncologists can contribute to this process by conducting research, presenting data, and providing feedback on proposed changes to guidelines. Overall, the relationship between surgical oncologists and guidelines is a close one, with surgical oncologists playing a critical role in the development, implementation, and refinement of guidelines related to the surgical management of cancer. Through their expertise and experience, surgical oncologists can help to ensure that guidelines are evidence-based, practical, and effective tools for improving the outcomes for patients with cancer.

In Korea, gastric cancer is a significant health problem with higher incidence rates than in many other countries. In response to this burden of disease, a series of clinical practice guidelines have been developed in Korea to help guide the diagnosis and treatment of gastric cancer. The first version of Korean gastric cancer treatment guidelines was developed in 2004 by the Korean Gastric Cancer Association. These guidelines were based on the results of clinical trials and expert consensus and covered topics such as diagnosis, staging, and surgical management of gastric cancer. The second version of guidelines was developed in 2014, including 23 recommendation statements for diagnosis ($n = 9$) and treatment ($n = 14$) based on key questions [16]. From this version, the guidelines were structured with a multidisciplinary approach. The third revision of the guidelines was published in 2018 by the Korean Society of Gastroenterology and the Korean Gastric Cancer Association, with the aim of providing a more tailored and individualized approach to the diagnosis and treatment of gastric cancer [17]. These guidelines emphasize the importance of multidisciplinary care and the use of personalized medicine approaches, such as targeted therapies and immunotherapy. Recently, the fourth edition of guidelines was published. Current guidelines are collaborative works of the interdisciplinary working group, with a total of 33 key questions updated or proposed and 40 statements developed according to the systematic review [15].

THE FUTURE PERSPECTIVE OF SURGICAL ONCOLOGISTS IN THE TREATMENT OF GASTRIC CANCER

The role of surgical oncologists will expand significantly over the years, with new advances in technology and research presenting opportunities for improved outcomes for patients with cancer. Some of the major future development areas for the

surgical oncologist include as follows:

1. Minimally invasive surgery: Laparoscopic surgery will become the standard procedure for nearly all cancer surgeries, including advanced gastric cancer. Robotic surgery is gradually expanding its field and is expected to show comparable or superior surgical outcomes to laparoscopy in the near future.
2. Immunotherapy: Immunotherapy is a type of cancer treatment and a rapidly growing field of harnessing the power of the immune system. Surgical oncologists are increasingly involved in the use of immunotherapy in combination with surgery or chemotherapy to improve outcomes for patients with cancer.
3. Artificial intelligence: Artificial intelligence is being used to improve the accuracy and efficiency of cancer diagnosis, staging, and treatment planning. Surgical oncologists are increasingly using artificial intelligence tools to assist in treating cancer patients.

CONCLUSIONS

Surgical oncologists play a pivotal role as essential members of multidisciplinary teams in the era of precision medicine. Additional roles, such as designing clinical trials and making guidelines, are required for current surgical oncologists. In the future, the activity field of surgical oncologists will be further expanded.

NOTES

Authors' contributions

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All authors read and approved the final manuscript.

Conflict of interest

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