



Prof. Jiaqing Xiang: no surgery for esophageal cancer is perfect

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“The happiest moment in my life was when I saved the lives of patients who had little chance of survival even after treatment. I felt that my hard work and wholehearted commitment to the surgery had finally paid off, and I was overjoyed at these moments.”—Jiaqing Xiang

When I was young

Concentration is the only real merit I had.

Jiaqing Xiang was born in 1963 to a family at Gaogou Town, Lianshui County, Jiangsu Province, China. He went to primary school at the age of five. In 1978, when he was fifteen years old, he was admitted to Shanghai Medical College, which was recognized by the State Council in the same year as one of the 88 key universities in China.

Jiaqing Xiang graduated from high school in 1978. His parents had too many children to take good care of, so his older brothers and sisters took him to school when he was just five. Due to the poor management at rural schools, he only spent ten years between primary and high school grades. He would have graduated from high school a year earlier if it had not been for the changes to the length of schooling.

Jiaqing Xiang had not begun to make full preparations for the national college entrance examination until two months before the start of the test. He described himself as “pathetic,” because he did not have a solid academic foundation or systematic textbooks, and even his teachers were going to take the examination along with the students. *“There was little school learning at those years. For mathematics, I barely knew how to address quadratic equations with one unknown, and I did not know how to resolve an integer or polynomial into factors.”*

He had become a desperate student in the last two months, and he barely slept in the evening. Studying so hard was not driven by any specific motive or goal to get admitted to the college; he said when recalling that period, *“I was still young and had little knowledge about the future. I just believed that I should seize the chance and do my best.”*

Nearly 300 students from his town participated in the

national college entrance examination, and only two were admitted to undergraduate universities. He was one of the two.

His parents were both working at the hospital. His mother was a doctor transferred from being a military health officer. Being a doctor was a respectable occupation at that time, and his father decided he should also go to a medical college, so he filed all his applications to twenty medical specialties in ten medical schools. Jiaqing Xiang was a bit upset at that time, but now he is very grateful for his father’s “unilateral” decision.

In spite of his now legendary achievement, Jiaqing Xiang was not convinced that he was a precocious child in the early years. To the contrary, he downplays his intelligence: *“My IQ is low because I took an IQ test when I brought my little daughter to have her IQ evaluated. I think concentration is the only merit I have.”*

Time is short, and the road ahead is long

There is no shortcut in the training of an esophageal surgeon.

“In the first place, you need to have a capable teacher; then you should have sufficient patient resources; ten years later you can be a qualified esophageal surgeon. At this stage, however, you are nothing but a skilled surgeon. It takes at least another ten years to be a professional surgeon with independent ideas and extraordinary skills.”

Jiaqing Xiang reckons that there is no shortcut in esophageal surgery. The standard three-field lymphadenectomy includes neck dissection, thoracic dissection, and abdominal dissection, and involves tumor removal, lymph node dissection, and esophagogastric reconstruction. There is no room for error at any step, and every procedure needs to be perfect (*Figure 1*).

Perhaps fate has its destiny. After graduation from Shanghai Medical College, Jiaqing Xiang came to work at the Children’s Hospital of Fudan University and the Cardiothoracic Surgery Department of Nanjing Gulou Hospital, but finally, he decided to pursue his dream of standing in the operating room. He studied and



Figure 1 Prof. Jiaqing Xiang performs cervical anastomosis after three-field esophagectomy for esophageal cancer.

obtained a master's degree and has since worked at the Department of Thoracic Surgery, Cancer Hospital of Fudan University.

“When I look back, the happiest moment in my life might be the period after I received the master's degree and before I could perform a surgery on my own.” He felt a strong sense of accomplishment every day because he had been making progress. In the beginning, he could barely handle simple surgeries, and later he could perform more complicated operations with instructions from his mentors and knowledge learned from books. Even attending a medical conference was a pleasure for him.

Listening and thinking more has become a habit for him. *“Even if you have understood 99% of what was shared by a speaker, you still have to take note of the other 1%.”* Speaking of these flashes of insight, he believes thinking not only takes place in the workplace, but also in bed, and sometimes in dreams. *“But I enjoyed myself very much,”* he remembers.

Jiaqing Xiang began to study three-field lymph node dissection for esophagus cancer in 1999. At that time, he had few opportunities to attend medical conferences and had little access to medical imaging data. He read a lot of Japanese anatomy books and figured out how to perform surgeries according to these books and illustrations.

Initially, a three-field dissection took the operators seven or eight hours to complete, typically starting at 8:30 a.m. and ending at 4 or 5 p.m. *“At that time, the surgeon who performed a three-field dissection often had to pay for the lunch of colleagues at noon because the surgery lasted too long.”*

The most challenging part of three-field dissection was to remove the left and right recurrent laryngeal nerve (RLN) lymph nodes—a problem which has hampered the broader application of three-field dissection. It was not until six years later that Jiaqing felt that he had mastered this procedure.

He still remembers the fourth esophageal cancer patient he operated on. When the lymph nodes near the left RLN were removed, bleeding occurred. He immediately administered hemostatic treatment. Only after the operation did he know that the place where he clamped for hemostasis was the left RLN. He suddenly recalled that the left RLN “is located at the origin of the aortic arch,” as described in textbooks. Fortunately, it was still a successful surgery, and the patient is still alive today.

For Xiang, the improvement of surgical technology is like the pursuit of truth: you can keep approaching it but cannot reach it. *“Don't think that the operation has been done perfectly. Many surgeons think the occurrence of a complication is due to the patient's bad luck or is an accident. But we must rethink whether we have not handled any link well enough. It's also true during the operation. If there's any action that feels a little awkward, you can find a more natural and smooth way to replace it.”*

Therefore, he has been looking for improvements in esophageal cancer surgeries. He has applied the right thoracic approach during the Ivor-Lewis esophagectomy for esophageal cancer, which allows the dissection of upper esophageal lymph nodes more efficiently. He is not rigid in thinking and open to new ideas. For instance, he combines open surgery with endoscopic surgery to make up for the shortcomings of both techniques. He never worries about “losing face.” When he felt that the traditional cervical “U-shaped” incision was not cosmetic, he went to the department of head and neck surgery to learn how to perform a “collar” incision.

“I now do more than 1,000 operations a year. But for most patients, it is their last chance to survive. So, we must cherish this final opportunity. Do no harm is the premise of surgery.” Under this premise, Prof. Xiang keeps learning and practicing day and night and has finally formed his unique style, with the way which most suits himself.

“The patients who have been treated by me in the past five years and will be treated by me in the coming five years are lucky.” He states bluntly that a mature esophageal surgeon is indispensable for his skill, conscientiousness, and energy, which can only co-exist within a short period.

The ultimate goal

A standardized radical esophagectomy for esophageal cancer.

Empirical medicine, standardized medicine, and precision medicine are three stages of medical technology development. For Xiang, the average level of treatments for esophageal cancer in China is still in an initial phase of transition from experimental medicine to standardized medicine:

“So now we can only offer every patient with a standardized radical operation for esophageal cancer; on this basis, every effort should be made to reduce accidental injuries. Because the lymph node metastasis of esophageal cancer is not regular, the pre-operative assessment is not accurate enough, with an accuracy of lower than 70%. If we fully depend on pre-operative assessment, the surgery will become a gamble, which is certainly not feasible. Thus, three-field dissection is the only choice, during which all the suspicious lymph nodes will be removed.”

Xiang encountered a typical case: the preoperative assessment showed that there were multiple lymph node metastases, and during the surgery, Xiang also felt that seven or eight lymph nodes were involved. He still remembers how the patient's daughter cried when he informed her about the disease condition after the surgery; however, the post-operative pathology showed that all the specimens were negative. *“Ten years have passed, and the patient is still alive. I had seen some similar cases when I participated in consultations in other hospitals. The preoperative assessment showed a typically positive result, and intraoperative observation showed consistent findings; however, the final pathological diagnosis was not as expected. Thus, the evaluation is not always accurate, and your eyes may cheat you.”*

Despite these issues, promoting a standardized radical esophagectomy for esophageal cancer is still a challenging task. The standard three-field lymphadenectomy includes neck dissection, thoracic dissection, and abdominal dissection. If a surgeon is not confident about one part, lymph node dissection in this part has to be reduced or even abandoned for the sake of safety. *“We are always talking about individualization of patients. In many places, however, esophageal cancer is still in the stage of individualization of surgeons; that is, the surgery performed depends on the capability of a surgeon.”*

According to Xiang, safety and radicalness are the most difficult and most crucial unity of opposites in the surgical treatment of esophageal cancer. *“I often tell my students, safety and radicalness are highly contradictory from the perspective of philosophy. A complete and thorough dissection of the involved lymph nodes is the premise of an effective surgery. If the left and*

right LRNs are not dissected, the surgery will be unsuccessful in at least one-third of the patients. The metastasis rate of cancer in the upper esophagus is as high as 40%, but the dissection can be extremely dangerous in this area. Both surgeons and patients have to bear the risk.”

Xiang recognizes that surgeons' experiences and skills dramatically affect the outcome of a surgery. Thus, he tries to perform salvage lymph node dissection after the operation, with an attempt to give a second chance of surgery to patients who have undergone incomplete lymph node dissection or suffered from metastasis after the procedure.

However, a controlled clinical trial led him to shift his focus from surgical techniques to oncology itself. The Ivor-Lewis esophagectomy for esophageal cancer via a right thoracic approach had been performed in the Tumor Hospital Affiliated to Fudan University for nearly six years. Compared with the traditional radical treatment for esophageal cancer via left thoracic approach, the Ivor-Lewis esophagectomy had a significantly longer 3-year overall survival (OS) and disease-free survival (DFS); astonishingly, the 5-year OS and DFS showed no significant difference between these two groups. *“Later, our literature review revealed similar findings: the OS and DFS might be different within three years but became similar in the fifth year, because systemic metastasis will become the major concern after five years.”*

Xiang realized that the optimization of surgical techniques has a limited role in improving the overall therapeutic efficacy. *“The ultimate goal of cancer treatment needs to be defined by three dimensions: safety, survival, and quality of life. A precise treatment may be achieved as long as we can address these three issues.”* There is no optimal treatment for individual patients, no matter if the surgery is performed openly or with an endoscope, via left or right thoracic approach, via single or multiple ports, radiochemotherapy first or surgery first. Ultimately, only the most suitable treatment for a specific patient is the best treatment. However, there is still a long way to go to achieve individualized treatment for each patient.

Nowadays, the most delightful thing for Xiang is that many patients who had been treated by him many years before having to come see him again for further treatment. *“I could not remember some of them. Then, I checked their medical records. If the disease were still in its early stage, I would take it for granted that the patient was still alive. If I found the patient already had six to seven metastases when he sought treatment for the first time, I would feel very proud of his or her survival. The happiest moment in my life is when I saved the lives of patients who had little chance of survival even after treatment.”*

“I still remember a patient with advanced esophageal cancer from a highly prevalent area. He revisited me, with some of his relatives with this malignancy. He told me that he was living well, and most of the other patients who had suffered from esophageal cancer and sought treatment in other hospitals had died. I felt that my hard work and wholehearted commitment to the surgery had finally paid off, and I was overjoyed at these moments.”

Tumor treatment is always full of helplessness. Not every patient can be saved, even after a “perfect” surgery. An unpredictable metastasis, fatal complications, and the uncertainty of life can affect the outcome of an operation, for which Xiang has been able to face calmly.

“Even if one day I am old and dead, I have no regrets. As long as the treatment of my patients is within my ability, I will try my best to do it.” Prof. Xiang reflects on his career as a surgeon: *“I’m grateful that my dad urged me to be a doctor, and then I chose to be a thoracic surgeon and finally an esophageal surgeon. I have never regretted it. I feel delighted. It makes my life very successful. I like this job very much.”*

Interview

JTD: *Which key points should be considered when performing the Ivor-Lewis esophagectomy for esophageal cancer via a right thoracic approach?*

Prof. Xiang: The right thoracic approach allows the complete lymph node dissection along the left and right RLN at the upper mediastinum. Interestingly, no matter whether the primary esophageal cancer is located in the top, middle, or lower segment, it is most likely to metastasize to the right and left RLN lymph nodes of the upper mediastinum, which cannot be dissected via a left approach. However, not all patients are suitable for the right thoracic path. One day I was invited to attend a consultation for a patient who had received surgery for right upper lung cancer three years before. Preoperative radiographic evaluation showed severe pleural adhesion. Bleeding would be massive if a right thoracic approach was adopted. I’ve been reflecting very carefully on this issue in recent years. I have learned a lot of valuable lessons from my own experiences. If the adhesion is separated forcedly, the esophagus might finally be opened, and the patient can survive; however, it can result in atelectasis, and a dead cavity may form. Once anastomotic fistula occurs, the fistula may not be wholly cured for life. The right approach is also not feasible for patients with scoliosis because the esophagus is bent to the left in some of these

patients and the esophagus may not be reached from the right approach. In some patients, esophageal cancer may have a close relationship with the aorta. A left approach is recommended for them because the aorta will be well exposed on the left side, and bleeding on the right side will be dangerous. Therefore, although the right thoracic approach is preferred, the left thoracic approach is more feasible in some cases. Individualized treatment should always be emphasized. For these patients, a three-incision left thoracic procedure will be established, which is slightly different from the conventional left thoracic approach.

JTD: *Would you tell us more about the three-incision left thoracic approach?*

Prof. Xiang: The conventional left thoracic approach is performed without turning patients over on the operating table. The dissection begins from the left chest, followed by the dissociation of the stomach via the diaphragm. The stomach is directly anastomosed with the esophagus without dissecting the upper mediastinum. However, this procedure is not radical enough. Therefore, in my practice, I will follow the procedure done in the right chest: after the esophagus in the left chest is dissociated, the patient is turned over to receive another cervical and abdominal lymph node dissection, to make up for the low radicalness of the mediastinal dissection in the left chest. This is the so-called turn-over three-incision approach plus cervical lymph node dissection in the left chest.

JTD: *You have mentioned that the radicalness and safety of right and left RLN lymph node dissection should be balanced. How can this be done?*

Prof. Xiang: The affected lymph nodes should be dissected, whereas the LRNs should not be stripped too much. Part of the blood supply should be preserved. The balance between lymph node dissection and LRN stripping should be gradually recognized in clinical practice.

JTD: *How do you define a standard radical esophagectomy for esophageal cancer?*

Prof. Xiang: First of all, the primary lesion should be removed as completely as possible, known as “total mesenteric excision.” If we cannot peel off the tumors, we should try to remove some normal parts of the mediastinal pleura. Second, the upper incision margin should be as

high as possible. Cervical anastomosis is recommended for most patients with esophageal cancer. Previous studies have shown that the 5-year local recurrence rate of esophageal cancer is 13% when the upper resection margin of the malignancy is 5 cm. So the shorter the esophagus preserved, the better. Our follow-up visits also confirmed that the recurrence rate was higher in patients with more of the esophagus preserved. Finally, at least a standard two-field dissection in the abdominal and mediastinal areas should be performed; if the technical conditions permit, three-field dissection should be performed.

JTD: *Could you briefly introduce salvage lymphadenectomy?*

Prof. Xiang: Cervical lymph nodes are a common site of metastases after surgery for esophageal cancer. The effectiveness of traditional radiotherapy and chemotherapy is not satisfactory. Therefore, if a cervical lymph node metastasis that is not closely related with a blood vessel or trachea is found during follow-up, salvage lymphadenectomy can be performed. Nearly one hundred cases of salvage lymphadenectomy have been conducted in our center, and the effectiveness was good. After lymph node dissection, radiotherapy can be added for suspicious situations. A recent survey showed that the 5-year survival rate after salvage lymphadenectomy was close to 50%. During this procedure, the dissection area is adjacent to the anastomotic site, which proposes higher technical requirements for cervical dissection during the second surgical operation.

JTD: *In your opinion, what is the scope of surgery after neoadjuvant therapy?*

Prof. Xiang: Surgery after neoadjuvant therapy is more useful for patients with advanced esophageal cancer. The 5-year survival rate of such patients receiving direct surgery is only about 20%. After receiving neoadjuvant radiotherapy and chemotherapy, more than 40% of the patients will have negative pathology results after surgery, and the 5-year survival rate can reach 50–60%.

JTD: *Would you share your experience in the perioperative care of esophageal cancer?*

Prof. Xiang: Up to 30% of esophageal cancer patients may develop complications. In our center, one out of ten

patients may suffer from severe complications. According to old textbooks, the anastomotic fistula was the main complication after surgery, and the case-fatality rate could reach 25–75%; fortunately, it is no longer as fatal today. The case-fatality rate of anastomotic fistula in our hospital is about 3%. Nevertheless, the occurrence of fistula is inevitable. So we should make appropriate preparation for fistula in every surgical patient and prepare for the worst. A drainage tube should be placed beside the anastomotic fistula during the operation. Once the fistula has developed, the drainage will begin immediately. In other words, we need to take measures to prevent and deal with anastomotic leakage in a timely way.

At present, lung infection is even more dangerous. Once hospital-acquired pneumonia occurs, the mortality rate is high because in most cases it is caused by drug-resistant bacteria and the chance of a successful outcome is low, although in some patients the condition may gradually improve one week later thanks to their antibodies. Therefore, prevention measures including smoking cessation and aerosol inhalation are essential. For long-term smokers with reduced pulmonary function, large-dose ambroxol hydrochloride (Mucosolvan) treatment before and after the operation can effectively promote the production of pulmonary surfactant, increase the concentration of antibiotics in the lungs, and exert its anti-inflammatory and antioxidant effects. Prevention of RLN injury during operation is also a key measure to prevent pulmonary infection. RLN injury will increase the difficulty of a cough and is associated with a higher chance of aspiration, leading to aspiration pneumonia. Early ambulatory activities are recommended after surgery, which is helpful for the recovery of the respiratory tract, and the whole body and can also prevent thrombosis. In our center, low-molecular-weight heparin is routinely applied in some high-risk patients (e.g., patients with diabetes, hypertension, hyperlipidemia, hyperglycemia, obesity, and lower extremity venous thrombosis) to prevent pulmonary embolism. Typically, the anticoagulation therapy begins on the day of surgery. Also, family members are asked to massage the patient's lower limbs, which is very important for rehabilitation.

Afterword

Most jobs in the world are nothing but a means to make a living. It's very fortunate for people to do a job that they are interested in. Capable people always want to do



Figure 2 Prof. Jiaqing Xiang.

more and can do more. Having an appropriate level of wisdom is lucky. Successful people share some qualities like perseverance, determination, and concentration. Prof. Xiang has all of them. It's fortunate for many esophagus cancer patients to have a doctor like him.

Expert introduction

Xiang Jiaqing, MD, professor, chief physician, and supervisor of master's candidates, was born in 1963. He is the current chief of the Department of Thoracic Surgery, Cancer Hospital of Fudan University. He graduated from Shanghai Medical College as a bachelor of medicine in 1983, and he received his master degree in medicine from Shanghai Medical University in 1991. He has long been engaged in the surgical and multidisciplinary treatment of

chest tumors including lung cancer, esophageal cancer, and mediastinal tumors. He is one of the pioneers of three-field lymph node dissection for esophageal cancer in China and has offered treatment for nearly 1,000 cases. He is skilled in thoracoscopic Ivor-Lewis esophagectomy for esophageal cancer, thoracoscopic radical resection of lung cancer, and thoracoscopic resection of mediastinal tumors. He is a well-known expert in the surgical treatment of thoracic tumors. In recent years he has published over 20 articles in peer-reviewed journals as the first author or corresponding author (*Figure 2*).

He also serves as the vice-chairman of the First Professional Committee on Chest Cancer of the Shanghai Anti-Cancer Association, as a member of the Fifth Professional Committee on Esophageal Cancer of China Anti-Cancer Association, and as vice-chairman of the Thoracic Surgery Branch of the Shanghai Association of Chinese Integrative Medicine. He was elected as a member of the Chinese Society of Clinical Oncology (CSCO) in 2006.

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Footnote

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