Prof. Yi-Tao Ding: my dream of building the best humanistic hospital in China

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In 2013, Prof. Yi-Tao Ding (*Figure 1*), director of Nanjing Drum Tower Hospital (*Figures 2,3*), the Affiliated Hospital of Nanjing University Medical School, treated two patients with unresectable hilar cholangiocarcinoma using the novel neoadjuvant chemoradiotherapy combined with orthotopic liver transplantation. As a medical practitioner and a hospital administrator, Prof. Ding has diligently worked in the health care field for decades and has made outstanding contributions.

Recently, *Annals of Translational Medicine* (*ATM*) had an interview with Prof. Ding, sharing his opinions on the treatment for hilar cholangiocarcinoma and the hospital management with our readers.

Prof. Yi-Tao Ding had been trained in PLA Institute of Hepatobiliary Surgery and Australian National Liver Transplant Center in his early years. Currently he is the Director and CCP Secretary of Nanjing Drum Tower Hospital. He is also the senior member and Chairmen of more than eight national and international societies, including the International Hepato-pancreato-biliary Association, Standing Committee of the Chinese Society for Organ Transplantation and he served on the editorial board of more than twenty journals including the Chinese Journal of Organ Transplantation. His research has been supported by the National 863 Program, Priority Research Program of the Chinese Academy of Sciences, the National Natural Science Foundation, and many other State-level research programs. He has published more than 300 scientific articles and monographs and was the winner of over 13 ministerial and provincial scientific research awards (as the first author). Under the tireless efforts of his team (example of team work is shown in *Figure 4*), the Department of General Surgery of Nanjing Drum Tower Hospital has been listed as a national key discipline and department (by the Chinese Ministry of Education), and the clinical medical center of Jiangsu Province. He has been awarded as the "National Expert with Outstanding Contributions", "National Top 100 Hospital Administrators", "Outstanding Staff Member in the National Health Care System", "Nanjing Science & Technology Hero", and "Nanjing's Top Ten Science & Technology Stars". After 1993, he began to enjoy special allowance from State Council of China. In 2004, he won the first "Chinese Clinician Award". In 2006, he was awarded as the "National Outstanding Hospital Director". In 2008, he was the winner of the "Award for the Outstanding Contributions to Hospital Managementnt

Early practice of piggyback liver transplantation and half extracorporeal hepatectomy

ATM: Prof. Ding, thank you for joining us at the interview. We learned that you have been to Australia to study the liver transplantation in 1990s. Would you like to introduce the background at that time?

Prof. Ding: I received medical training in Australia in 1995. When I first came to Australia, the local doctors were very skeptical about the competence of Chinese doctors and they showed me a photo of a huge liver tumor to test my capability. I told them that I had to perform hundreds of surgeries to remove similar sizes of liver tumors every year, and then they all gave me full marks and have never looked down upon our Chinese doctors ever since. Soon after that the local colleagues advised me to take examinations to obtain medical license from the Australian Medical Council. After having successfully obtained the medical license, I began to perform surgeries at a local hospital. The only difference between me and the local doctors was that I received no salary but free accommodations and a little transportation subsidy of about $70 a week. At that time my wage was less than RMB 1,000 a month in China. Conditions were really tough for Chinese people working in foreign countries. Sometimes I had to shuttle among several hospitals in order to learn more, and I finished breakfast at a hospital and brought some extra food to another hospital so that I would not have to buy my lunch there.

Figure 1 Prof. Yi-Tao Ding in the operation room.

Figure 2 Full view of the new building of Nanjing Drum Tower Hospital.

Figure 3 Bird's eye view of Nanjing Drum Tower Hospital.

ATM: After you returned home, the first case of piggyback liver transplantation in East China was successfully performed by you upon the invitation of Prof. Mengchao Wu (the well-known hepatobiliary surgeon named as the "father of hepatobiliary surgery" in China). Would you tell us more about that case?

Prof. Ding: I returned to China in 1996, and then I was involved in East China's first case of piggyback liver transplantation. It was on May 24, 1996 that Prof. Wu invited me to participate in the liver transplantation. In fact, I was trained in Prof. Wu's department in 1980s, so Prof. Wu hoped that my training experience in Australia would help their surgical operations. This surgical procedure was quite challenging. You had to fully utilize your brain and hands to resolve various problems occurring during the operation. For example, the massive intraoperative bleeding could be a serious problem. Fortunately, it was reported that patient finally survived for more than 10 years.

Figure 4 Hepatopancreatoduodenectomy (1).

ATM: In addition to the piggyback liver transplantation, you are also the creator of the half extracorporeal hepatectomy in China. What's the inspiration for your first case?

Prof. Ding: Actually, early in 1990s, Prof. Wu had thought about the introduction of extracorporeal hepatectomy in China. However, it had never become a reality due to multiple difficulties. Then I came to a thought and proposed a scheme of "half extracorporeal hepatectomy". Maybe because I had pondered on this for a long time, I was finally endowed with the inspiration. Prof. Wu was so glad that his dream was realized after I developed this procedure. Today this surgery has become a normal procedure and it may be hard to image how difficult it was back in 1990s. What should be noted is that innovation is always a treasure for scientific research.

Development of a model of interdisciplinary cooperation through multi-center studies

ATM: In 2013, for the first time in Asia, your team performed the neoadjuvant chemoradiotherapy combined with liver transplantation for patients with unresectable

hilar cholangiocarcinoma. What is the advantage of this treatment protocol?

Prof. Ding: A significant number of patients with hilar cholangiocarcinoma have already became intolerable for surgical resection when they are presented, because the hepatic hilum is located at a hidden site and the tumor often invades the major blood vessels and thus are difficult to operate on. So, before the transplantation, the first thing we need to make sure that the patient does have an unresectable lesion. The idea came from abroad. In the Western countries, a few literatures have reported the combination of neoadjuvant chemoradiotherapy and liver transplantation in treating Stage I and II cholangiocarcinomas. We then develop a multidisciplinary treatment strategy for the unresectable hilar cholangiocarcinoma with our currently available resources that fit our patients.

ATM: Why do you think the combination of neoadjuvant chemoradiotherapy with liver transplantation would be feasible for Chinese patients with stage III unresectable hilar cholangiocarcinoma?

Prof. Ding: Once a tumor is rated as stage III, the role of surgical resection is very limited. In these patients, radical resection is impossible, and the patients often suffer from recurrence. In China, the disease often becomes advanced when they are presented (due to jaundice). In the past, these patients were kind of "sentenced to death". Today a new strategy called "bundle treatment" has been adopted in our hospital. More specifically, it is a multidisciplinary treatment mode combining both the neoadjuvant chemoradiotherapy and the in situ liver transplantation, attempting to reduce the cancer to a descent stage before the surgery, achieve the radical resection of the lesion during the surgery, and prolong the long-term disease-free survival time after the surgery.

ATM: To our knowledge, multi-center clinical studies on this combination will be carried both in China and abroad. Would you briefly tell us more about these studies?

Prof. Ding: We have applied this combined therapy in several patients, and up to now the outcomes have been quite good. Thus, recently we have initiated an international multi-center clinical study together with some partners such as the Chinese University of Hong Kong and the New York Medical College (*Figure 5*). Of course, the approvals from Ethics Review Board and the registration of clinical trials are required before the initiation of this project. Our current project is not just a multi-center study but also a model of interdisciplinary cooperation. Many experts from the departments of hepatobiliary surgery, gastroenterology, oncology, nuclear medicine, pathology, and radiology were involved in this study, performing multiple rounds of multidisciplinary intra-hospital discussions for each patient. In addition, some medical companies (e.g., a company that manufactures biliary stents carrying radioactive particles) also participate in this project. There are many excellent young scholars in our team, and they often have many creative ideas. My task is to facilitate them to translate these ideas into realities, which represents a process of innovation. Today, many modern enterprises have adopted "assembly lines" during the production. Likewise, similar cooperation process can be applied among hospitals. In future, the diagnosis and treatment of one patient can be performed step by step in different hospitals. Of course, issues may incur during such cooperation. We need to be more open-minded towards these issues and find more reasonable solutions through the inputs of all the stakeholders. Our team will carefully review the involved parties during the integration and enhance the information sharing.

Figure 5 Prof. Youmin Wu (the Fifth from the left) from New York Medical College meeting with Prof. Ding's team in Nanjing Drum Tower Hospital.

It is our goal to build the best humanistic hospital in China

ATM: When we first came into the Drum Tower Hospital, we felt it quite different from the same level of hospitals in other cities in China. For instance, we can see piano and Starbucks as well as other supportive facilities inside the hospital. As an excellent hospital adminstrator, would you

Figure 6 The piano in the outpatient hall of Nanjing Drum Tower Hospital.

Figure 7 The library in Nanjing Drum Tower Hospital.

please share your philosophy and experience about hospital management?

Prof. Ding: I'm still far from an expert of hospital management, but indeed I have gained some experience after working in the administrative line for years. Premier Li Keqiang stressed that the overriding priority for China's healthcare reform is to motivate the medical staff. However, it does not mean that spending more money will necessarily make a better hospital. When we paid a visit to the Mayo Clinic in the United States, we were surprised to find its excellent mode in developing doctors' outlook on basic values. In China, a doctor's professional competence is largely decided by how many papers he or she has published at prestigious journals and how many times their papers were cited by others. By saying the publications cannot fully reflect a doctor' value, a doctor should harbour humanistic feelings. You may have seen how doctors treat their patients in Japan, and they provide not only medical treatment, but also considerate services. In our hospital, you can see a piano at the outpatient hall (*Figure 6*). It's intended to relieve the physical and mental stress of the patients (*Figure 7*). We hope patients not only get cured at our hospital, but also receive emotional comfort and consolation. I believe this will be an evident trend in the future, and hospital construction should demonstrate the importance of humanity care. Therefore, it is our goal to build the best humanistic hospital in China.

ATM: Hepatobiliary Surgery is a preponderant medical discipline at the hospital and across China, so what is the main direction of its future development?

Prof. Ding: Hepatobiliary surgery is an advantageous discipline in our hospital compared to that in other hospital in China. In the future we will continue to focus on the basic and clinical research on chronic severe liver diseases as well as hepatobiliary tumors. Also, our studies will cover liver transplantation, bile duct cancer, and artificial bile duct. With regard to artificial biliary duct, we have devoted a lot of manpower, material and financial resources and suffered setbacks with new challenges, but our research will move on in the hope that one day we can develop treatment guidelines that fit Chinese patients.

We need knowledge of philosophy and humanistic feelings to be a good doctor and researcher

ATM: Prof. Ding, we learn that you are a member of the standing committee of Chinese Society of Organ Transplantation and have been studying organ transplant for many years. As we know, shortage of organ donors has been a big challenge for organ transplantation in China. Now we notice from media reports that 3D print technology may possibly be applied to the medical industry in the future. What's your opinion about this technology? Do you think it can solve the problem of organ shortage?

Prof. Ding: This reminds me of the talk of "universal organ" a few years ago. To my understanding, 3D print technology is an engineering breakthrough, but there are still a lot of thorny issues to be further studied and addressed before the technology can be used in the biomedical field. If we only need an external organ, like an ear, the existing 3D print technology can satisfy the need. Because for external organs like ear, we just need an object that looks like ear, not an object with sophisticated functions. But things could totally be different if we want to "print" more complicated organs like liver, which carries more than 500 physical functions. How many functions can the "printed liver" achieve? And what materials should we

use to print a liver? These issues have not been properly considered at present. Of course, for people of my age, we cannot jump to conclusions that there is no possibility for these issues to be resolved some day, since many things we thought impossible in the past have become reality later. So I hope 3D print technology can be used in the medical industry some day in the future and bring the medical science to new heights.

ATM: As for the training of young doctors, would you like to give your suggestions?

Prof. Ding: Though I'm always busy, I will be present at every meeting for opening report and thesis defense conducted by my students. I believe that the master candidates' major task is to learn how to do scientific researches, while doctorate candidates need to develop innovative thinking. When the youngsters came to work on the first day, I told them that philosophy is as important as your profession, because philosophy can make doctors smarter and help them identify the principal tasks out of the miscellany of them. People without knowledge of philosophy and humanistic feelings can neither be good doctors nor good researchers.

ATM: Thank you very much!

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(Science Editor: Grace Li, ATM, editor@atmjournal.org)

