

Interview with Dr. Yi-Wei Chen: education is the main method to popularize BNCT, a powerful special cancer treatment

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Editor's note

The 3rd Annual Academic Conference of Taiwan Society of Neutron Capture Therapy (Jointly with the 10th Trilateral BNCT meeting between Taiwan and Japan) was held in Taipei Medical University Hospital in Taiwan on January 27th, 2018. Experts from Taiwan and Japan exchanged their opinions and discoveries related to Boron Neutron Capture Therapy (BNCT) on the forum. AME Publishing Company was honored to have the opportunity to interview Dr. Yi-Wei Chen, a doctor serving at Taipei Veterans General Hospital, to share with our readers his experience as a pioneer of BNCT treatment in Taiwan. During the interview, Dr. Chen mentioned the history of BNCT in Taiwan and the clinical application of BNCT in Taiwan's most hospitals on the horizon.

To know more, please refer to the following in-depth interview with Dr. Yi-Wei Chen by *TRO* (Figure 1).

Experts' introduction

Dr. Yi-Wei Chen (Figure 2) is an assistant professor of the faculty of Medicine, National Yang-Ming University and an attending physician of Department of Oncology, Taipei Veterans General Hospital, Taiwan.

His researches mostly focus on Adult and Pediatric Neuro-Oncology. Besides, he also has research interest in particle therapy with high radiobiological effectiveness, including BNCT. With his outstanding academic achievement, he has received several research grants from Taiwan's Ministry of Science and Technology. Now, he is also the executive board member of International Society of Neutron Capture Therapy (ISNCT), an important global society for the development of BNCT. Concerning the application of BNCT, in 2017, he once applied BNCT on a recurrent malignant brain tumor case. Not enough radiologists in Taiwan are familiar with the concept and application of BNCT. To accelerate the development of BNCT in Taiwan, Dr. Chen is also an



Figure 1 *TRO* editor took a photo with Dr. Yi-Wei Chen after the interview.



Figure 2 Dr. Yi-Wei Chen.

important member of Taiwan Society of Neutron Capture Therapy, TSNCT and has worked hard to promote BNCT.

Get a close look at Boron Neutron Capture Therapy

TRO: *It needs experts from different fields to apply BNCT, like physicians, radiation oncologists, physicists, chemist, and so on. Could you tell us your role in BNCT and the new trend of BNCT?*

Dr. Chen: As I am a radiation oncology doctor, I usually use the radiation and the X-ray for the clinical cancer patients. But except frequently-used radiation treatments, there is also another kind of cancer treatment called BNCT, which is a special particle therapy for cancer patients. It could be the best treatment for patients with brain tumors since it could create different effects compared to ordinary therapy. Since lots of expertise are needed in BNCT, as a clinical doctor, my duty in BNCT is to strive as much as possible to survey patients who are suitable to be treated by BNCT. After finding the suitable cases, I will gather the relevant experts, make a detailed treatment plan, and then refer the patient to Tsing Hua Open-Pool Reactor (THOR, an open reactor in Tsing Hua University, 80 kilometers away from my hospital) for neutron irradiation. After the treatment, I will be in charge of observing the patient and following up the treatment results.

Nevertheless, one reality could not be ignored. In fact, some patients might be not suitable for BNCT because BNCT is a very special cancer treatment. Before we start the medical treatment, we have to make the positron emission tomography (PET) examination; therefore, we need to refer patients to our nuclear medicine department for special PET, called F-BPA PET. If patients' results of F-BPA PET do not reach the criteria of undergoing BNCT, we cannot apply BNCT to patients.

TRO: *What is the disadvantage of BNCT?*

Dr. Chen: BNCT is a high biologically effective cancer treatment. Hence there are some disadvantages certainly. The main disadvantage is "toxicity". The most used boron drug, BPA, has lower toxicity to tissues for sure. However, if we can deliver it specifically only to the tumor cells, surrounding normal tissues would not be influenced by the toxicity of drugs or undergo side effect brought by the therapy. Because of this reason, drugs play an important role in BNCT. With suitable drugs, the disadvantage brought by BNCT could be avoided. Moreover, this special particle therapy has high radiobiological effectiveness, which means there are high linear energy transfer effect, so the tumor

cell will be destroyed significantly. As a result, it is an ideal cancer treatment because we can highly destroy cancer tumors with less tissue toxicity. In short, BNCT could provide more hope than other standard treatments.

The vision of Boron Neutron Capture Therapy

TRO: *BNCT has a long history, but it is not so popular in the world. Taiwan and Japan have the newest BNCT technique. Could you share the BNCT's development in Taiwan and Japan and what's the difference?*

Dr. Chen: BNCT is a multidisciplinary treatment. For applying BNCT, we need a lot of experts including clinical doctors, nuclear engineers, medical physicists, and biologists, chemists to work together, so it is not easy to do this kind of treatment in a single institute. Both in Japan and Taiwan, BNCT could be developed since there are enough experts, facilities, and associations built to coordinate the cooperation among experts from different fields. De facto, there are more BNCT researchers and experts in Japan, so they can cultivate the experts more quickly. Their BNCT research achievements and techniques have even outperformed than anywhere else in the world and I spent one year for advanced study of BNCT in Kyoto University Research Reactor Institute (KURRI) in 2010. Now, in Taiwan, we also have the similar technique, and we will try to improve our technique so that we can provide more and more cancer patients with this kind of treatment in the future.

TRO: *As one of the few Taiwanese experts in BNCT, which is not familiar by most radiologists in Taiwan, you have the newest technique and knowledge about BNCT. What's the vision of BNCT you see?*

Dr. Chen: I think BNCT is a very special cancer treatment and the future of BNCT looks bright. After the concept of BNCT introduced to Taiwan from Japan, we would like to establish an association: Taiwan Society of Neutron Capture Therapy (TSNCT), to provide a lot of education for young researchers so that we could teach them how powerful BNCT is. Members of TSNCT have tried to achieve this objective through education. Education is the main method to popularize this powerful special cancer treatment. With our efforts, maybe in the future, more and more young guys will understand the mechanism and the theory of BNCT; therefore, BNCT could become an option for more



Figure 3 Dr. Yi-Wei Chen: education is the main method to popularize BNCT, a powerful special cancer treatment (1). Available online: <http://www.asvide.com/article/view/23388>

patients. By letting more patients benefited from BNCT, we can promote BNCT more easily and reach our ultimate goal benefiting patients.

Please check the video for more information (*Figure 3*).

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