APHRS NEWSLETTER

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Contents

Introduction of the Saitama Medical University, International Medical Center

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Assistant Professor, Deputy Director of Cardiology Department, Saitama Medical University International Medical Center

The Saitama Medical University was first established in 1972 in Moroyama, Saitama. Our International Medical Center was established in 2007 in Hidaka City. Saitama prefecture is in the northern part of Tokyo, and our Hidaka city is located in the western part of Saitama, 80km away from Haneda Airport (*Figure 1*). The International Medical Center specializes in treatment for emergency medicine, cancer, cerebrovascular disease, and cardiovascular disease. The Cardiovascular Center consisted of the Cardiovascular Department, Electrophysiology (EP) Department, Cardiovascular Surgery Department, Pediatric Cardiovascular Department, and Pediatric Cardiovascular Surgery Department.

We have three catheter laboratory rooms and one hybrid operating room. Structural interventions, such as transcatheter aortic valve implantations, mitral clips, left atrial appendage occlusions (LAAOs), and percutaneous atrial septal defect closures, are performed by the intervention team. Heart transplantations and left ventricular assist device therapy are also performed for severe heart failure patients by the heart team.

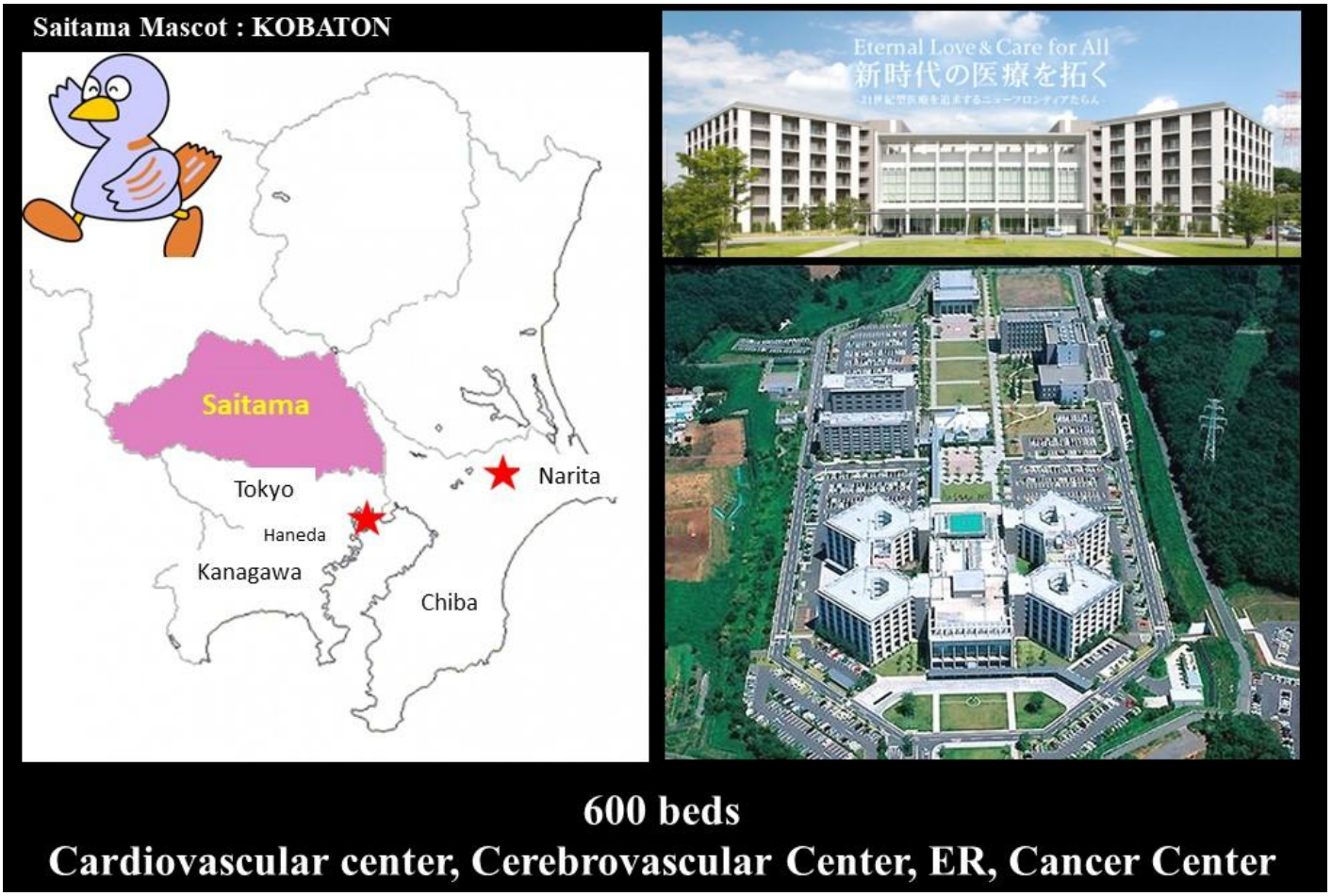

Figure 1. Location of Saitama and picture of our hospital

Electrophysiology Department

Our team was established by Professor Kazuo Matsumoto, a former director of the EP Department and current Editor in Chief of the Journal of Arrhythmia. Professor Ritsushi Kato is the current director of our team, and the team consists of three attending EP doctors and five EP fellows (*Figure 2*).

Figure 2. The attending EP doctors, EP fellows, medical engineers, and device nurses

Our EP team performs ablation therapy, device implantations, lead extractions, and LAAOs. Our hospital has three mapping systems (CARTO system, Ensite system, and Rhythmia system), and we have selected the best system considering the tachycardia characteristics. Catheter ablation was first performed at our hospital in 1990, and we performed ablation in more than 500 ablation cases in 2021 including supraventricular arrhythmias, atrial fibrillation, premature ventricular constrictions, and ventricular tachycardia (*Figure 3*). The majority of the cases are for atrial fibrillation, and balloon ablation is performed too. The pediatric cardiovascular team (Professor Naokata Sumitomo) performs ablation for children, including tachyarrhythmias after surgery for congenital heart disease.

We also perform cardiac implantable electronic device (CIED) therapy implantations for about 300 cases per year (*Figure 3*). Not only conventional transvenous implantations but also leadless pacemaker implantations (Micra, Micra AV) have been performed for bradycardia patients. Transvenous implantable cardioverter defibrillators (ICDs) and subcutaneous ICDs are implanted in patients with ventricular arrhythmias. Cardiac resynchronized therapy is performed for heart failure patients. The CIED treatment has been supported by medical engineers and specialized CIED nurses. They use remote monitoring systems to follow up with the CIED patients. We have also been performing lead extractions since 2009. More recently, LAAOs have been performed for high-bleeding-risk patients with AF.

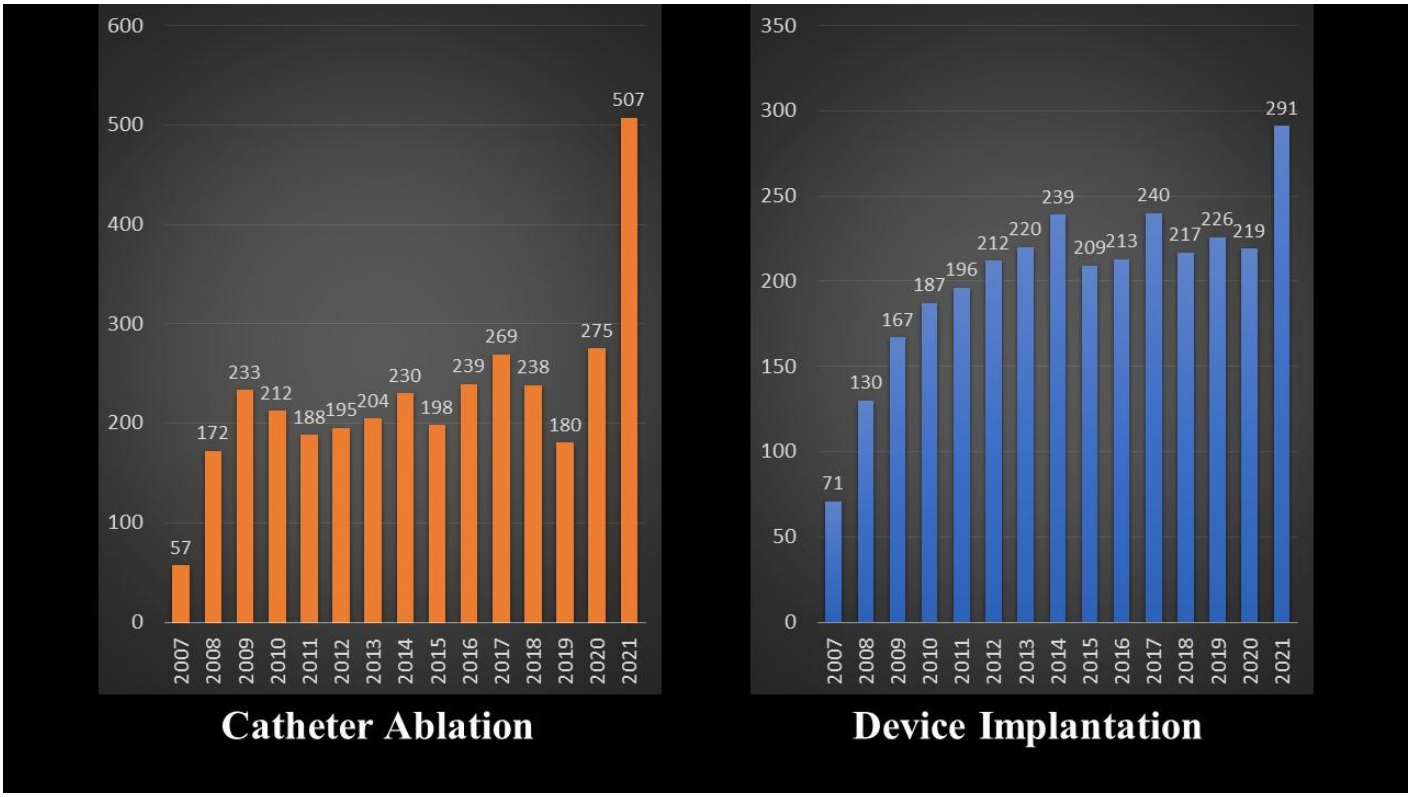

Figure 3. Catheter ablation & CIED implantation cases in our hospital

Our researchers have recently focused on the biophysics of the ablation and mapping technologies. We have also performed research on device treatments, using our device database since 2007. Eight original articles and 4 case reports have already been published and a lot of presentations have been shared during several meetings.

Our facility has welcomed a number of doctors, other medical professionals, and students domestically and from abroad. Four Turkish EP doctors have trained at our hospital between 1998 to 2011 (*Figure 4*). They are now playing important roles in their home country.

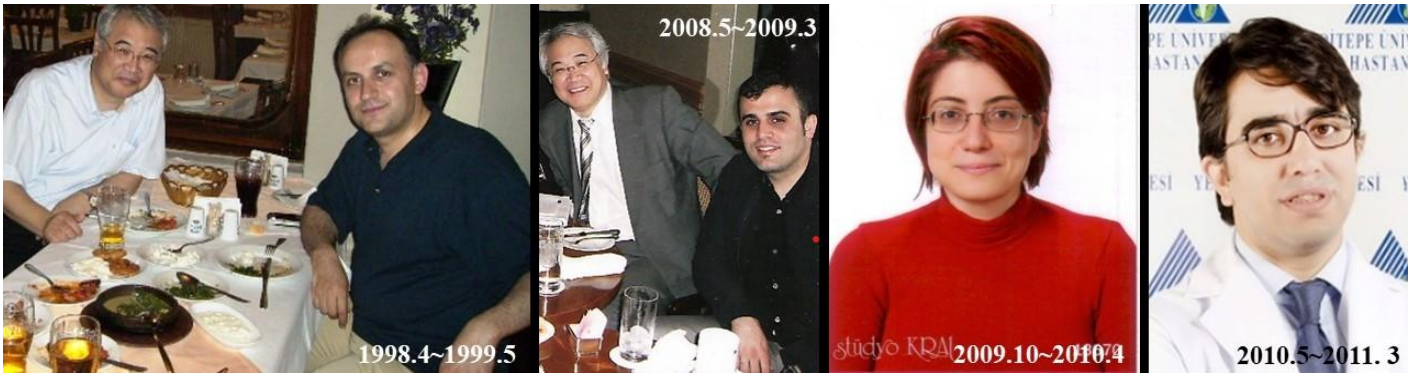

Figure 4. Four Turkish EP doctors have trained at our hospital since 1998 to 2011

GETTING TO KNOW APHRS LEADER

Kumar Narayanan, MD

APHRS Young EP Subcommittee Chair 2023

Director of Cardiac Electrophysiology
Medicover Hospitals, India

Why did you choose to enter medicine and above all, prefer to specialize in Electrophysiology?

From my school days, I have been fascinated by the workings of the human body which are truly wondrous and appealed to my sense of scientific inquiry. Furthermore, medicine is one of the few fields where you can have the satisfaction of directly intervening and improving someone's life for the better. During undergraduate medical training, I became interested in rheumatic heart disease, which is still a significant problem in India and decided to do cardiology. However, during my cardiology fellowship, when I was exposed to electrophysiology, the idea of being able to decipher the origins of arrhythmias and potentially cure them was simply amazing. I was also fortunate to encounter some excellent teachers in the field, including my outstanding mentor Dr C Thomas Peter, who further fueled my interest to take up EP as a career.

What do you regard as the most significant development in Electrophysiology in the recent past?

I think conduction system pacing has been a very exciting development and has rapidly evolved in the last 3 to 4 years. It's an old idea revisited, but dedicated tools are now available to enable us to do a much better job of it. I am particularly excited by the prospect that it could form a more cost-effective alternative to cardiac resynchronization therapy (CRT). India has a large heart failure population, but most people eligible for advanced device therapies are unable to afford it. Hence lower cost innovations which deliver outcomes on par or potentially better than existing technologies hold major relevance in our context. I am eagerly looking forward to further developments in this field.

Can you talk about an accomplishment that you are particularly proud of?

I started being involved in research in the field of sudden cardiac death (SCD) during my EP fellowship in the US. In 2015, I returned to a private practice set-up in India and generally in private practice, it is difficult to continue involvement in academics and research. However, due in part to my perseverance, some good friendships established across borders over the years and support from my institution, I have been fortunate to pursue my research interests and recently crossed 100 indexed publications in PubMed.

If you could have an alternative career, what would it be and why?

I would probably be a school teacher. I have always loved teaching and the opportunity to interact with young, curious minds, to potentially shape and guide future leaders of the society would be both interesting and satisfying!

Who has inspired you the most in your life and why?

I was fortunate to have my medical education in Christian Medical College, Vellore, in South India which is a 120-year-old institution with a rich heritage. During my time there, I encountered inspiring stories of several medical pioneers. Two such that especially inspired me were those of the founder Dr Ida Scudder, and legendary hand surgeon Dr Paul Brand. The life stories of these two great personalities serve as examples of what one can achieve with persistence and determination in the face of overwhelming odds.

What are your hobbies and interests outside of medicine?

I like reading books, doing crossword puzzles and enjoy good music. I also love to travel and discover new places, meet new people and understand different cultures.

What is the funniest thing that has happened to you recently?

With everyone wearing masks due to covid, sometimes you don't recognize people (and vice versa) when you see them maskless! I remember one instance where I was in the office and had temporarily removed my mask when a relative of an admitted patient walked in. I clarified her doubts and explained further plans for the patient, when she interrupted me and said that the family would agree only if Dr Kumar Narayanan advised them directly! I told her that I was indeed the same person and she looked sheepish and said I looked very different without a mask (for better or worse I am not sure!)

What is your best life advice, motto or favorite quote?

The ancient Indian text of Bhagavad Gita states: "Perform your duty but be not attached to the results". In essence it extorts us to do our job sincerely, to the best of our ability but to be serene in our minds whether we succeed or fail. I think knowing that even the best of people can fail on occasion, we must remain grounded and focused on doing our job with commitment without worrying about outcomes.

What advice would you give to your younger self?

Looking back, I would probably advise myself to respect myself more, be more confident and assertive. I would also reinforce the thought that while it is important to chase goals and dreams, it is also important to enjoy the journey at the same time and to not worry too much if things are not going as you planned. Ultimately things may work out in unexpected ways sometimes!

What are your thoughts about some of the emerging technologies, and the way they will shape the future care of arrhythmia patients?

I think we are living in a transformative era as far as technology is concerned. On one hand, devices are becoming smaller and more connected and on the other hand, developments in genetics and genomics hold the promise of delivering truly personalized medicine. Wearable devices, mobile technology with geo-localizing capability and drone delivery have the ability to revolutionize emergency responses. Artificial intelligence and machine learning are also witnessing rapid strides enabling more automation and the ability to effectively handle big data to enhance our understanding of disease processes and improve therapies.

If you were a movie character, who would you be and why?

I would like to be Tintin- honest, straightforward, courageous and with a healthy dose of luck!

You're a new addition to the crayon box. What color would you be and why?

I think I would be red because I am partial to bold colors that stand out.

How do you keep a healthy work/life balance?

I always keep in mind that if we want something, we need to give up something else- there are only 24 hours in a day. We all need to decide our individual comfort zones, while being realistic about our professional goals. I realized early that immersing myself completely only in work cannot be satisfying or sustainable for me. I made conscious decisions not to take on certain extra work during evenings/weekends. As a result, I have had to give up some opportunities, but I have gained in terms of giving time to myself and to family. This keeps me going and able to give my best professionally.

Favorite weekend activity?

Reading a good fiction book on a quiet afternoon.

Arrhythmia Streams Live at the 70th Annual Scientific Meeting of The Cardiac Society of Australia and New Zealand (CSANZ 2022)

***Dr Andrew Martin**, MBChB*
Clinical Lead, Heart Rhythm Service, Auckland City Hospital, Auckland, New Zealand

Following two years of virtual meetings, the 2022 Cardiac Society of Australia and New Zealand convened at the Gold Coast of Australia in August was a date circled by many Cardiologists and Electrophysiologists. For many it was the first in person meeting since the start of the Coronavirus pandemic and proved a fantastic opportunity to reconnect with old friends and colleagues (and make new ones too). I had the privilege of co-ordinating the Arrhythmia stream alongside Dr Matthew Webber (Wellington Regional Hospital, New Zealand), and Prof Prash Sanders (Royal Adelaide, Australia).

We were delighted to be joined by a distinguished international faculty including Prof Hui-Nam Pak (Yonsei University, South Korea), Prof Sabine Ernst (Royal Brompton Hospital, UK), and Dr Miguel Valderrabano (Houston Methodist Hospital, USA). Prof Pak provided insights into the evaluation and ablation of non-pulmonary vein triggers for AF, and Dr Valderrabano on the use of ethanol infusion within the vein of Marshall to augment catheter ablation in the treatment of persistent atrial fibrillation. Prof Ernst gave an overview of her early experience of using remote navigational assistance to undertake complex ablation procedures with vascular access via arm veins.

The meeting had a total of eight arrhythmia sessions with topics ranging from lead management to atrial arrhythmias in ACHD patients, and imaging in VT ablation to stroke prevention. A particular theme of the meeting was improving equity. This was exemplified by Assistant Prof Daehoon Kim's (Yonsei University, South Korea) lecture regarding how social inequalities in South Korea influence the introduction of non-vitamin K antagonists in patients with atrial fibrillation.

A particular highlight of the meeting is the debate. This year, Associate Prof Darren Hooks (Wellington Regional Hospital, New Zealand) and Prof Rajeev Pathak (Canberra Heart Rhythm Centre, Australia) contested the moot “catheter ablation should be used before anti-arrhythmic medications to treat patients with paroxysmal atrial fibrillation”. The audience was treated to a sterling and at time humorous appraisal of recent data and how best to apply this in our clinical practice. As a New Zealander, I may be biased, but I felt Assoc Prof Hooks was the victor!

The four days of the meeting simply flew by with relationships created and ennewed. The next meeting in Adelaide 2023 can’t come soon enough.

Clinical Practice for Arrhythmia in the Post-Pandemic Era - What We Learned from the COVID Pandemic?

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Introduction

The novel coronavirus disease (COVID) that emerged in late 2019 and spread rapidly around the world has had a devastating impact on public health and our daily life. As cardiologists, we had to deal not only with pneumonia, but also with cardiovascular events such as thromboembolism and arrhythmias.[1,2] Today, more than three years have passed since the beginning of the pandemic and the situation has calmed down considerably worldwide. In this letter, we would like to share the current medical situation in Japan and what we have learned from this apocalyptic period.

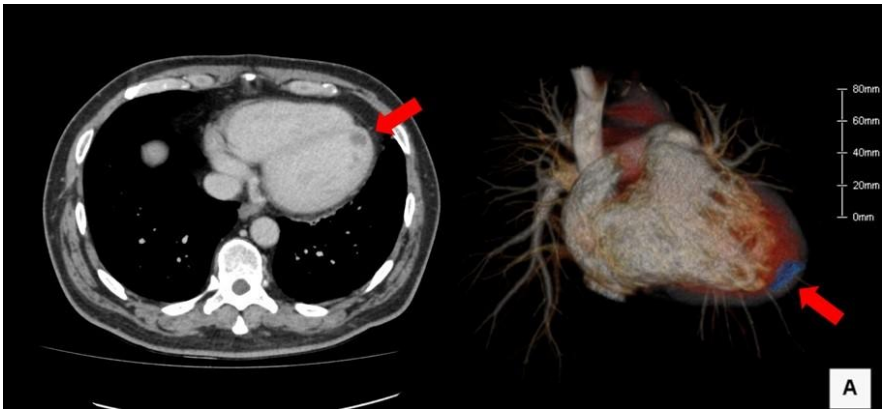

Figure 1. A case of COVID infection with acute ST-elevation myocardial infarction. Figure of thromboembolism in the right coronary artery. (A case from own institution)

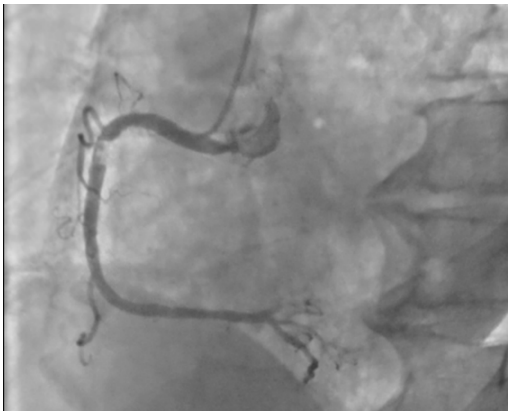

Figure 2. A case of COVID infection with acute ST-elevation myocardial infarction. Figure of thromboembolism in the right coronary artery. (A case from own institution)

Arrhythmia Practice During the Pandemic

Since the outbreak of COVID infection in December 2019, Japan has declared a public health emergency a total of four times. Although the number of infections and deaths has been lower than in other countries, many medical facilities have experienced a severe shortage of medical resources. The author's hospital was no exception, as general practices became overwhelmed with COVID patients, resulting in a significant decrease in the number of catheter ablation procedures and cardiac device implantations.

In addition, as the government implemented the lockdown of cities and restricted social contact to control the spread of the disease, patients tended to refrain from visiting the hospital. Our hospitals have experienced an apparent decline in the number of newly diagnosed or referred arrhythmia patients in the outpatient setting, and nationwide, the number of the secondary health problems, including out-of-hospital cardiac arrest, has become a serious concern.[3,4]

Figure 3. A deadly silent train in Tokyo under lockdown. (Photo by Kazunori Kasahara)

Figure 4. Tokyo International Airport, where people disappeared after the COVID outbreak. (Photo by Kazunori Kasahara)

Contemporary Japan in Transition to the Post-COVID Era

After three chaotic years of viral mutation transitions, we are getting back our daily routines as vaccines become widespread and herd immunity is developed. Although still more infectious and fatal than influenza, the death rate is steadily declining. In Japan, the government plans to change the status of COVID infection from "Class 2" (the same as severe acute respiratory syndrome and some avian influenza) to "Class 5" (the same as seasonal influenza) as of May 2023. Although late compared to other countries, the government also issued a statement on the wearing of masks, leaving it to the discretion of the individual, which was finally lifted in March of this year. Society is moving forward, step by step, towards the post-COVID era.

Clinical Practice Focused on “Social Distance”

Digital transformation (DX) has been accelerating over the past decade, even before the pandemic, and healthcare, traditionally based on face-to-face interaction with patients, was no exception. The pandemic, which fundamentally changed public health and our lifestyles, became a turning point to intensify the trend of telemedicine supported by DX.

Arrhythmia care, especially implantable cardiac devices, was an area where telemedicine systems were conventionally developed. Follow-up visits for cardiac device are crucial for monitoring device function and patient condition, but the frequency of outpatient visits varies among institutions and physicians. This can lead to heterogeneous detection and response to sudden changes in patient condition, arrhythmic events, and device malfunctions. Telemonitoring systems have conventionally been recommended as a standard method of cardiac device management, a means to compensate for the aforementioned shortcomings and can reduce the frequency of patient visits.[5,6] Needless to say, the pandemic has accelerated the trend towards the implementation of telemonitoring systems, which contribute to the reduction of spatial and temporal human contact.[7,8] Before the COVID pandemic, our institution had approximately 750 cardiac device patients being followed up in the outpatient clinic, and about 75% had adopted a telemonitoring system. However, since the pandemic, more than 90% of the newly implanted patients are introducing the system. We are now working as much as possible to introduce the system to outpatients, and are also trying to extend the follow-up intervals accordingly. Naturally, those who introduced a telemonitoring system could reduce the number of clinic visits and also minimize their contact and length of each visit by analyzing the follow-up information sent prior to their visits. These benefits also contributed to improved patient satisfaction.

Because of the lack of conventional face-to-face examinations, it is important to make a sufficient assessment of the patient’s condition at the time of system implementation to ensure their safety in case of an emergency. However, these telemetry systems, accelerated and established by the pandemic, are more useful and beneficial than ever in providing comprehensive support to patients.

Figure 5. Electrical storm induced by COVID infection in a patient after ICD implantation and surgery for tetralogy of Fallot. (A case from own institution)

Smart Device and Healthcare

Another trend in clinical practice that has grown with the trend of DX is the use of smartphone applications (apps) and smart devices.[9,10] The Apple Heart Study to detect atrial fibrillation in a large healthy population is still fresh in our minds.[9] Some hospitals in Japan have recently started smartwatch clinics. In this area, our institution has previously reported on the effectiveness of a smartphone app to promote smoking cessation.[11] In addition, our electrophysiology lab has also conducted a study to evaluate the detection of atrial fibrillation using the Apple Watch app compared with conventional devices, which is currently under analysis. It is expected that these smart devices, which are widely used by the general population, will further promote health maintenance as a means of primary and secondary prevention.

Final Remarks

COVID infections were an unprecedented catastrophe that caused numerous sacrifices over three years. However, in the field of arrhythmias, where personal contact has traditionally been avoided, the accelerating trend toward telemedicine and the use of smart devices will surely improve patient health and well-being even in the post-pandemic era.

It is the first unrestricted spring in Japan in four years. People are enjoying Hanami under the beautiful cherry blossoms, feeling the new breeze of post-pandemic.

Figure 6. Blooming cherry blossoms during and after the pandemic. (Photos by Kazunori Kasahara)

Acknowledgments

Author is grateful to Kazunori Kasahara for providing the amazing photos.

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