LEGENDS IN UROLOGY

Keong Tatt Foo, MBBS, FRCS (Edin.), FAMS
Clinical Professor
Emeritus Consultant
Department of Urology
Singapore General Hospital
Singapore

My life journey

Introduction

My journey in life began in the state of Penang, in Malaysia, a small tranquil island to the North of the Malay Peninsula, in the then Straits Settlement under British Colonial Government. It was 50 days before World War II broke out in the Pacific region, and I was fortunate to survive infancy and early childhood. The war lasted for 3 years and 8 months. The population pyramid showed a significant dent in my age group! Part of my fortune to survive could be attributed to the fact that I was born into a big extended Hakka Family. The Hakka, an ethnic group of Chinese originally living in the North of China, in the Yellow River Basin, are known to be tough survivors. Due to famine and war, some of my ancestors migrated south to warmer climates in the Southern Provinces of China, where they became the Hakka, meaning "guest people". They had to settle in the less fertile part of the land, the hilly regions far from the coast, and carve out a hard life. They terraced the hills to grow food and lived in large extended families. They built large houses like modern-day condominiums for mutual help and protection from bandits. These included large square dwellings and better-known round houses (tu lou) in the southern province of Fujian. This was where my ancestors settled and where the family tree, dating back about 600 years, can be traced to the village blacksmith! I am the 18th generation of the clan with the family name Hu, or Foo, spelled in Malay.

Watercolor painting by KT Foo - 2006.
My ancestral village in the Hakka region in China. Round houses for communal living for large extended families were mistaken for possible missile launching sites by an American spy satellite!

My mother was also a Hakka, and her ancestors came from the same county of Yongding as my father, in the Fujian province. The Hakka women did not bind their feet as was the custom in those days during the Qing Dynasty. This was mainly because the Hakka women were tough and worked in the fields, apart from doing housework and bringing up children. One wonders what the men did! They probably wandered around to find better fortune elsewhere, as my great grandfather did. Partly also because of the civil war in the south of China, the Taiping Rebellion, my great grandfather migrated to the South Seas (South East Asia or Nanyang in Chinese), to seek his fortune. He went to Indonesia and then to Malaya and settled in the south of the island of Penang where my grandfather was born.

Childhood days

My memories of my childhood, spent in the hills and padi (rice) fields at Bayan Lepas, a small village in the south of Penang Island, are happy ones. With my

brothers and many cousins, I used to roam the hills and catch fighting fish in the padi fields. I attended the village Chinese primary school from age five, and learned to read and write in Chinese, giving me a good foundation to understand the classic literature, philosophy, and history of China. After 4 years I was selected to join an English school for my further primary and secondary school education at Balik Pulau, the district capital about 10 kilometers away. The English education helped me connect with the world and with science.

For extracurricular activity, I joined the Boy Scouts movement in school and promised to do my best to God and country, to help other people at all times, and to obey the 10 scout laws. These are: to be trusty, loyal, helpful, brotherly, courteous, kind, obedient, smiling, thrifty, and clean in body and mind. We enjoyed the outdoor life, hiking and camping during the holidays. We learned to love nature and be observant, which was important in later life. We were taught not only to be good, but to do good.

I was good at mathematics in school and was considering a career in engineering. However, it was scouting that influenced me to consider taking up medicine as a career. A medical doctor would always be able to help other people, in times of peace or war. Anywhere in the world, his service would be needed. So when the time came to apply to university, my choice was clear, and I was fortunate to be admitted to the fast track for medical school at the then University of Malaya in Singapore, in 1960.

Medical school days

Singapore had one of the oldest medical schools in the area, which started as King Edward VII College of Medicine, with public donations in 1905. Subsequently this became part of the National University of Singapore.

Apart from learning anatomy, physiology, and biochemistry, I found time to join the Rover Scout Crew at the university, with other medical school and law school undergraduates. We helped run the boy scout troop at the school for the blind over the weekends, and took the boys on hikes and camping expeditions by the sea. During the long university vacation, I organized expeditions to the Malayan National Park and explored other parts of the Malay peninsula. These helped to sharpen my organization skills, learning to work and play as a team, which was useful in my future career. The motto for the Boy Scout Movement is also to "Be prepared" and always have a plan B. This is also important in clinical practice. Often, patients' progress is unpredictable!

Becoming a surgeon

I graduated with Bachelor of Medicine and Surgery degree (MBBS) in 1965, exactly 50 years ago, ready to help people at all times. I returned to Penang Island to do my internship at the Penang General Hospital, and did 6 months of General Medicine and 6 months of General Surgery. I found General Surgery more attractive, since more patients can be cured and the results are more immediate. This is especially true in trauma cases with solid-organ rupture or acute head injury with extradural hematoma. One of my first published papers was on head injuries. After the internship in Penang, I was transferred to the East Coast of Malaya, the less developed part of the country, as part of my national service for medical graduates. I went willingly and spent 2 years there, again being posted to the General Surgery Department, since my predecessor was allergic to rubber gloves! The posting suited me fine. The first bladder stone I removed was from a 10-year-old boy, not an elderly man with a benign prostate obstruction. This was because in that part of the relatively underdeveloped country, bladder stones were common in children, due to nutritional deficiency. Other pathologies included obstructed hernias and cleft lips in adults. With the guidance of a consultant surgeon, I was able to hone my early surgical skills.

After 2 years, it was time to move on to more formalized training, and I joined the then newly opened University Hospital in Kuala Lumpur, in the first batch of surgical trainees. The surgery department at this hospital in Malaya was under the charge of Professor Nien Kiong Yong, a well-trained cardiac surgeon and a good mentor. He introduced structured training and regular teaching rounds, and he also provided excellent patient care. I learned to give patients the best, not only your own best, from him. This is because your best may not be the best. Doctors need to know their limitations and refer patients to others to get the best available care, especially in complex cases. This practice would also help to develop the various subspecialties in the department. After 2 years of General Surgery, in this well-run department, Professor Yong helped me to get a resident surgical officer job, at the London Chest Hospital in the United Kingdom, in 1970.

Open-heart surgery was in its early development, and the morbidity and mortality were high. After 6 months, I found a job as a Registrar (senior resident) at Peel Hospital, in the tranquil Scottish border town of Galashiels. I

had time to study for my postgraduate examination in surgery, and passed the Surgical Fellowship Examination in Edinburgh, in 1971. With this postgraduate qualification in surgery, I joined the Department of Surgery at my Alma Mater, the then University of Singapore, in August of 1972 as a lecturer in surgery.

The university's Department of Surgery was at the Singapore General Hospital, the only university-affiliated general hospital at that time. Apart from teaching duties, lecturers also acted as junior consultants to service the busy outpatient clinic and attend to emergencies at night. When on call every fourth night, we would be on our feet until 3 or 4 am. We would be up and continue the routine work the following day from 8 am to 5 pm. Life was busy but we learned fast and thrived. Urology was still part of general surgery, consisting of about 25% of the workload. When the time came for my sabbatical leave, my Chief of Surgery Professor Siew Chey Ong encouraged me to take up urology, especially endoscopic surgery, which was just in its infancy in Singapore.

Specializing in urology

With a Fellowship from the Smith and Nephew Company, I spent time at the Institute of Urology in London with well-known urologists such as Professors John P. Blandy, Innes Williams, and Geoffrey D. Chisholm. Though I learned much theory through the teaching sessions and observing, I was not able to have much practical training. After 3 months, Dr. Innes Williams helped me transfer to the new Addenbrooke Hospital in Cambridge, where I learned transurethral surgery under the guidance of Dr. Robert Whitaker, well-known for the Whitaker test for upper urinary tract obstruction. I am forever grateful to his mentorship.

It was the introduction of transurethral surgery that spearheaded the development of urology in Singapore in the early 1980s. The subsequent introduction of noninvasive extra corporeal shockwave treatment for stones prompted a group of us general surgeons with a special interest in urology to form in 1986 the Singapore Urological Association (SUA), with me as the Founding President. SUA helped to lobby to establish urology as a specialty, and in 1988, the first Department of Urology was formed at the Singapore General Hospital. I was appointed Head of the Department and helped to direct the development of the specialty. Since then, all other general hospitals in Singapore have their own urology departments or units. It is only with recognition of urology as a specialty, that it can further develop. The past 30 years have seen advances in urology - upper tract endoscopy, laparoscopy, and robotic surgery - and the Singapore Urology Department has been able to keep up. This is also largely due to the farsightedness of our Ministry of Health, providing the support and the implementation of the Health Manpower Development Plan (HMDP). A structured training program was established and qualified urologists have the opportunity to go overseas for further training in the subspecialties, and overseas experts are invited regularly to Singapore to teach.

What have I learned in my 50 years of medical practice?

I was fortunate to play a part in the development of urology in Singapore with a wonderful team of pioneers, and enthusiastic new generations. My concern is that with new advances, we may forget that medicine is still more of an art than a science. Apart from acute trauma and infections, most of the time nature heals patients via the immune system. If the immune system is impaired, however meticulous your surgery is, the wound will not heal. For cancer patients, it is the grade or aggressiveness of the disease that determines the final outcome, more than our expertise. A patient with well-differentiated prostate cancer will do well whatever the treatment, and a patient with poorly differentiated cancer will not survive long, often even after aggressive surgery, radiation therapy, and chemotherapy. Sometimes we may do more harm than good. So it is important for us to have a balanced perspective. Compassion is as important as competence. Our role as urologists is to make a proper diagnosis, predict the natural course of the disease, and facilitate the healing process.

I learnt from Professor Wu Jieping, (1917-2011) the pioneer of urology in China, the fundamentals of good clinical practice with just six Chinese characters: "Yi qie wei le bing ren" (一 切 为 了 病 人). Rearranged in different sequences, the various meanings encapsulate what a good clinical practice should be. Translated into English, it means that whatever we do should be in the interest of the patient, and we should treat the patient as a whole and attend to all patients equally irrespective of class or creed. Treating the patient as a whole is exemplified by our studies on clinical BPH.

My romance with BPH (clinical research)

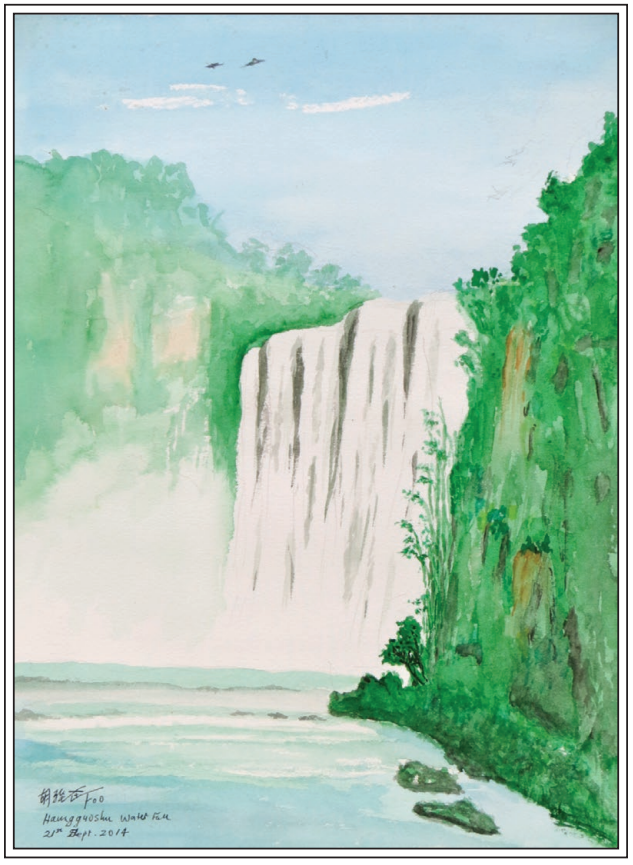
LUTS/BPH is such a common urological problem worldwide and yet it is such a misunderstood condition. My clinical research on LUTS or BPH began in 1995 when the AUA introduced the AUA symptoms score for the management of BPH. However, we learned in medical school, that we should treat the disease and not the symptoms. It does not

matter if the guidelines are backed by evidence-based medicine (EMB). If there are questions or controversies, it is better to go back to basic fundamentals, the pathophysiology of the disease. Our response to the AUA symptoms score was to introduce our staging system for LUTS/BPH which is based not only on symptoms but also on obstruction. We would then treat according to the disease severity, which is fundamental in all clinical disease management. So I wrote up the first article on the proposed classification of staging of BPH for further management, which was published in a special issue on urology, in the *Annals of Academy of Medicine Singapore*, in 1996.[1]

In this BPH staging system, classification is based on bothersome symptoms and significant obstruction. Why should a clinician be bothered, if the patient is not? He or she should be concerned only if the obstruction is significant enough to cause organ dysfunction. The basic functions of the bladder are storage and emptying, so when emptying is affected, there would be persistent post void residual (PVR) urine, and if storage is affected, maximum voided volume would be low. Both parameters can easily be measured in the clinic. With this scoring system, BPH can be classified as stage I, no bothersome symptoms and no significant obstruction; stage II, bothersome symptoms but no significant obstruction; stage III, significant obstruction; and stage IV, presence of complications such as acute or chronic urinary retention, persistent hematuria, stones, or recurrent UTI.

We produced evidence that this staging for a benign disease like BPH is feasible,[2] but our paper was rejected by an established international journal. The reviewer commented that, to classify BPH, the size of the prostate is important and should be included. Reflecting on the feedback, we came up with a grading system that classified BPH by including the size and shape of the prostate. This was done using the then newly introduced transabdominal ultrasound in the clinic. We observed that the shape of the prostate, as shown by the intravesical prostatic protrusion (IPP) in the sagittal view, is related to the urine flow rate as a surrogate for obstruction. The greater the IPP, the more severe the obstruction.[3-5] Obstruction is related more to the shape than the size of the prostate gland.[6,7] Many other papers on IPP validated our findings that a simple measurement of the IPP on transabdominal ultrasound is useful in predicting obstruction and therefore the progression of BPH.

Finally, we return to the question: What is clinical BPH? Current guidelines define clinical BPH as benign prostatic enlargement (more than 20 g) but then in our study on this subject, we find that small prostates can still cause significant obstruction. Our study with phenotying of BPH according to the size (PV) and shape (IPP) helped us realize that clinical BPH is essentially a benign tumor, an adenoma or multiple adenomata, like that of the breast fibroadenoma.[8] The adenoma at the prostate gland in the male would cause varying degrees of obstruction, depending more on the site or where the adenoma developed, rather than the size. There may be symptoms or no symptoms, as in patients with chronic obstruction. It may often confound the diagnosis of prostate cancer with elevated PSA. The larger the prostate, the higher the PSA would be.



Water color KT Foo - 2014.
Huangguoshu waterfall in Quangxi China.
Urologists, "Go with the flow"! Be natural and free!
All things flow freely in nature - not unlike water in the rivers or fish swimming in the water.
Even storms come and go freely, unimpeded.
Nature is at ease with all, naturally.
To be enlightened is to become natural,
to become at ease with everything,
to resist nothing in the world, to not feel hurt,
and to embrace everything in the world,
but to not feel attached.
To flow unimpeded, free. (Author: anonymous)

Thus we can simply define clinical BPH as essentially a prostate adenoma, of varying sizes, causing varying degrees of obstruction with or without symptoms. The adenoma can generally be detected with noninvasive transabdominal ultrasound assessing the IPP. IPP has 100% positive predictive value for the diagnosis of PA, but a low negative predictive value.[8] In general, there is good concordance between the grade of IPP and the stage of clinical BPH. Only a minority of patients with low grade IPP, but with poor flow or high PVR, need further investigations with flexible cystoscopy or UDS.[9-11]

Clinical BPH is not diffuse enlargement, but nodular hyperplasia with adenoma or adenomata. Being nodular and irregular, it is difficult to remove it completely with TURP or vaporizing laser. The way forward would be enucleation of prostatic adenoma, be it by open, laparoscopic approaches, or transurethrally with holmium laser, or bipolar enucleation and resection of the prostate (TUERP).[12] TUERP would be more cost effective, since no new investment in equipment is needed.

Conclusion

With this system of grading and staging of BPH and its definition, the evaluation and management of LUTS/ BPH is now more complete, treating the patient as a whole for further management. This conforms with the recent push for not just evidence-based medicine but evidence-balanced medicine, which is more important in real-life (individualized) clinical practice.[13,14]

The above clinical research, I believe, is my contribution to urology, to further improve the care of our patients. To see the concepts accepted would mean more to me than any honors I may receive. Hopefully this work will be my legacy, which will justify my inclusion in this "legends" section of this journal.

I am grateful to have a loving family with my gynecologist wife, Sek, and son Chuan, a musician, and a large extended family for support. I would like to acknowledge the contributions of many generations of residents and fellows in our department and the administrative staff in our clinical research in the past many years. I am thankful to the Singapore General Hospital and Department of Urology to allow me to continue to work full time, even though I am well past retirement age!

Keong Tatt Foo
Emeritus Consultant
Department of Urology
Singapore General Hospital

References

1. Foo KT. Current assessment and proposed staging of patients with benign prostatic hyperplasis. *Ann Acad Med Singapore* 1995;24(4):648-651.
2. Chia SJ, Foo KT. Is staging of benign prostatic hyperplasia (BPH) feasible? *Ann Acad Med Singapore* 1999;28(6):800-802.
3. Yuen SJ, Ngiap JT, Cheng CW, Foo KT. Effects of bladder volume on transabdominal ultrasound measurements of intravesical prostatic protrusion and volume. *Int J Urol* 2002;9(4):225-228.
4. Chia, SJ, Heng CT, Chan SP, Foo KT. Correlation of intravesical prostatic protrusion with bladder outlet obstruction. *BJU Int* 2003;91(4):371-374.
5. Tan YH, Foo KT. Intravesical prostatic protrusion predicts the outcome of a trial without catheter following acute urine retention. *J Urol* 2003;170(6 Pt 1):2339-2341.
6. Lim KB, Ho H, Foo KT, Wong MY, Fook-Chong S. Comparison of intravesical prostatic protrusion, prostate volume and serum prostatic specific antigen in the evaluation of bladder outlet obstruction. *Int J Urol* 2006;13(12):1509-1513.
7. Lee LS, Sim HG, Lim KB, Wang D, Foo KT. Intravesical prostatic protrusion predicts clinical progression of benign prostatic enlargement in patients receiving medical treatment. *Int J of Urol* 2010:17(1):69-73.
8. Luo GC, Foo KT, Kuo Tricia, Tan Grace. Diagnosis of prostate adenoma and the relationship between the site of prostate adenoma and bladder outlet obstruction. *Singapore Med J* 2013; 54(9):482-486.
9. Wang DL, Foo KT. Staging of benign prostate hyperplasia is helpful in patients with lower urinary tract symptoms suggestive of benign prostate hyperplasia. *Ann Acad Med Singapore* 2010;39(10):798-802.
10. Foo KT. Decision making in the management of benign prostatic enlargement and the role of transabdominal ultrasound. *Int J Urol* 2010;17(12):974-979.
11. Wang D, Huang HH, Law YM, Foo KT. Relationships between prostatic volume and intravesical prostatic protrusion on transabdominal ultrasound and benign prostatic obstruction in patients with lower urinary tract symptoms. *Ann Acad Med Singapore* 2015;44(2):60-65.
12. Zhang KY, Xing JC, Chen BS, et al. Bipolar plasma-kinetic transurethral resection of the prostate vs transurethral enucleation and resection of the prostate: pre and postoperative comparison of parameters use in assessing benign prostatic enlargement. *Sing Med J* 2011;52(10):747
13. Foo KT. Philosophy of balance, the art of healing. *Ann Acad Med Singapore* 2012;41(2):87-90.
14. Lim WS, Ding YY. Evidence balanced medicine: "Real" evidence based medicine in the elderly. *Ann Acad of Med Singapore* 2015;44(1):1-5.