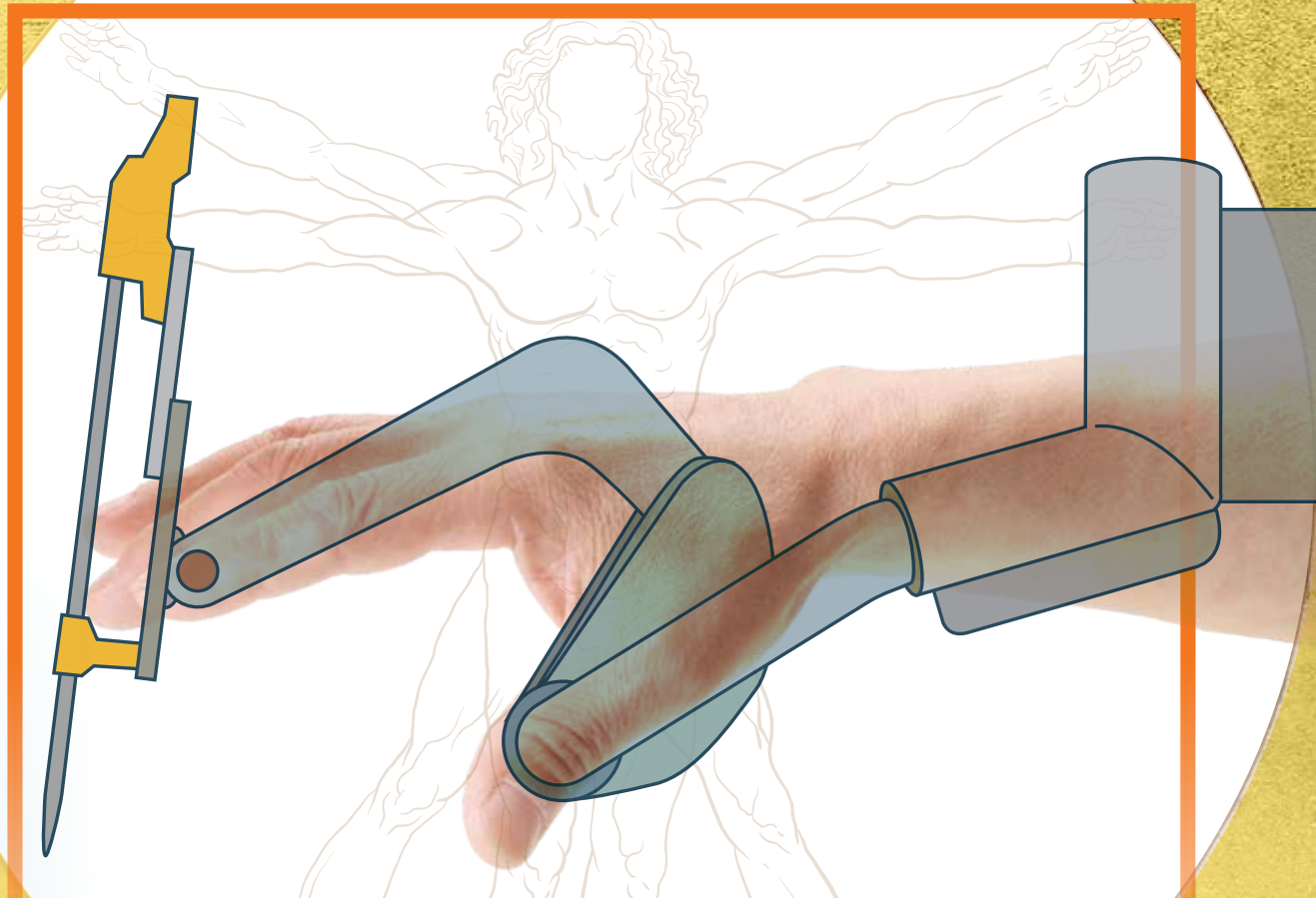


3D da Vinci

Tzu Chi Hospitals da Vinci Surgery





The da Vinci robotic arms, integrated with 3D high definition video, can operate in narrow surgical spaces inaccessible to human hands; Tzu Chi Hospitals can now perform minimally invasive surgeries with the robotic arms of the da Vinci system, without sawing open patients' sternum or causing big surgical wounds, with minimal bleeding, less pain and short recovery time, patients can return to their normal lives faster.

By You Shou-Hua

Mr. Fang, recently retired from a service agency, is a man who routinely walk around the house and is passionate about joining social events, which makes it practically impossible to tell that he was diagnosed with bone metastatic prostate cancer only 5 years ago. "I am fine now, especially after choosing the da Vinci surgical system to perform radical prostatectomy, I don't have to worry about my health ever again," Fang said with loud confidence.

Radical Treatment of Prostate Cancer with Medicine and Surgery

In a health examinations, Fang discovered that his prostate specific antigen (PSA) was abnormal, and decide to visit Kuo Hann-Chorng, Director of

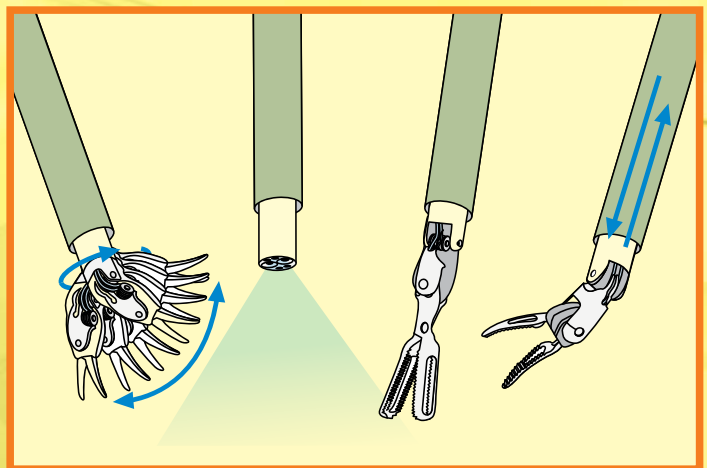
Urology in Hualien Tzu Chi Hospital (also Vice CEO of Tzu Chi Medical Foundation), for further examination. The diagnosis confirmed the presence of malignant prostate cancer. Fang explained that there was nothing alarming in his daily life, no discomfort or anomalies, he simply listened to the advice of a friend and went for a general health examination and cancer screening in a hospital by his work.

Fang was confident in Dr. Kuo's skills. Since he was ill, and work was busy, he cooperated fully with Kuo's advice and accepted systematic hormone therapy. Hormone therapy is a drug treatment that lowers the androgen level in patients' body to inhibit or regulate the growth of prostate cancer cells.

With few years of medication, Fang went for a follow-up. The bone scan

About the da Vinci Surgical System

Robotic arm surgical system that allows chief surgeon to see through a 3D high-resolution video, and can operate surgical instruments on the robotic arms to perform intricate movements like rotate, grab, and pinch, as natural and fluid as a surgeon performing laparotomy. Not only does the system overcome the disadvantages of traditional laparoscopy, it also offer patients the best therapeutic results.





Hualien Tzu Chi Hospital introduced the da Vinci surgical system, and its first application was in Aug. 14, 2014, on radical prostatectomy.



revealed that the metastatic lesions were gone, and that there were no signs of lymphatic metastasis. Dr. Kuo believed that Fang's malignant prostate cancer had become localized, showing superb inhibition. Because his physical health was in great shape and wished to live a healthy retirement life, Fang listened to Kuo's advice and chose the minimally invasive da Vinci radical prostatectomy that had low-risk and faster recovery.

Reduce Bleeding & Complications

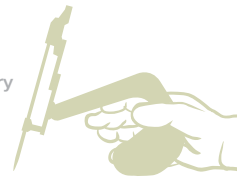
The da Vinci surgical system was

implemented in Hualien Tzu Chi Hospital since Aug. 10, 2014. About 60% of its application in urological treatment were radical prostatectomy for prostate cancer. In fact, the first use of the system was on prostatectomy.

Prostate cancer is one of the most common cancers in men. According to the census of Health Promotion Administration, it is ranked 6th in the 2014 Taiwan's top 10 cause of death. Traditional prostatectomy is a difficult, time-consuming surgery. Surgeons must perform a lower abdomen incision that is 20 to 25 cm in size, which often leads



With the da Vinci surgical system, surgeons can see the enlarged 3D video of surgical site, and operate agile robotic arms to perform precise and intricate movements to complete surgery.



to mass bleeding and a painful and prolonged recovery. The surgery also has significant side effect, such as sexual dysfunction and urinary incontinence. Dr. Kuo pointed out that the da Vinci surgery can accurately avoid blood vessels and nerves to significantly reduce blood loss during the procedure; and when compared to traditional surgery or laparoscopy, it can avoid complications such as urinary incontinence and sexual dysfunction. It is a revolutionary advancement in the history of prostatectomy.

Furthermore, the da Vinci robotic arms can be utilized in urinary reconstruction (urinary tract reconstruction, vesicoureteral reflux surgery), partial or total cystectomy, and partial or total renal resection. Dr. Jiang Yuan-Hong, an excellent visiting doctor tutored by Dr. Kuo, added that the urological team also use the system on

autologous augmentation cystoplasty, a surgical procedure that is yet to be seen on any published literature.

Autologous Augmentation Cystoplasty with Intricate Robotic Arm Movement

Yi-Jan is a 15-year-old girl with beautiful tan and bright smile. It is hard to associate her with a child who had suffered congenital spina bifida at birth and had been troubled by abnormal bladder function. From dependence on artificial bladder stoma to learning self-catheterization, bathroom breaks to Yi-Jan were not breaks at all. Sometimes she had to self-catheterize 7 times or more per day, she said, and in worst case scenario once every hour; even when asleep, she had to set alarm clocks and regularly self-

Features of the da Vinci Robotic Arms:

- **3D field of view, providing surgeons with vibrant, high-resolution video that realistically depicts human tissues for intricate and precise operation of surgical instruments.**
- **The robotic arms mimic motions and agility of human hands, allowing precise surgical movements in narrow spaces inaccessible to human hands, breaking through the limitations of traditional surgical operations.**
- **Clear field of view allow accurate blood-staunching and suturing, and surgeons can perform surgeries while seated, which is beneficial for prolonged complex or difficult surgeries.**
- **The robotic arms cannot operate on its own or make any decisions. It is up to surgeons to decide the best course of action.**



Standing strong in the face of her congenital disease, the optimistic Yi-Jan is awarded the President's Education Award. The photos shows Yi-Jan, her father, and Dr. Kuo Hann-Chorng.

catheterize.

The abnormal bladder function not only adversely affected Yi-Jan's daily routine, the poor cleanliness of the bathrooms and the improper disinfection of urinary catheter often led to urinary tract infection or irritation, and sometimes kidney issues as well. When she was 2nd year in junior high, Yi-Jan had to take an entire semester off, Yi-Jan's father recalled. This kind of life continued until she travelled half a Taiwan, from Hsinchu to Hualien, to meet Dir. Kuo Hann-Chorng

did her life changed for the better.

She had met countless doctors, did countless tests ever since she was small, Yi-Jan explained, and seeing a new doctor can be stressful. In spite of that, when she first met Dr. Kuo, he told her with a firm voice, "I know you have done many tests that are uncomfortable, but trust me, my tests will feel different." Kuo personally conducted ultrasound and urodynamic tests for Yi-Jan, to which Yi-Jan said, "It really doesn't hurt at all!" It was then did she overcame the fear of treatment,



and grew trust for this eccentric “uncle doctor”.

Abnormal bladder function is a common problem for many spina bifida patients, who have to face this problem at birth. When drafting treatment plans, different therapeutic methods are chosen in accordance to patients’ age. Dr. Jiang Yuan-Hong explained that Dr. Kuo started off with botox treatment, and arranged the autologous augmentation cystoplasty during the summer vacation before Yi-Jan started high school.

Considering Yi-Jan was still in puberty, gastrointestinal absorption is vital, Dr. Jiang pointed out. Generally, autologous augmentation cystoplasty use intestinal wall to increase bladder capacity and decrease intravesical pressure. Therefore after a thorough discussion among Yi-Jan, her father, and Dr. Kuo, they agreed to perform autologous augmentation cystoplasty using the da Vinci robotic arms. With the robotic arms that are highly stable and with precision, it can peel off thicker regions of the bladder tissue to effectively increase bladder capacity.

Yi-Jan, resting in the ward, smiled happily after the surgery, “other people may not know what it feels like, but what I feel is a significant improvement!” During the follow-up one month after discharge, Yi-Jan’s bladder capacity increased from the original 250 cc to almost 600 cc. According to Yi-Jan’s father, when

they first visited Dr. Kuo in Hualien, they thought of him as someone extraordinary, and he and his team trustworthy. Dr. Kuo also promised Yi-Jan that he would take care of her until she marries, a solid promise that truly moved him.

Saving Lives by Paying It Forward

One of the urology patients was an aboriginal in his late 50’s, who was also suffering from prostate cancer. When his surgeon provided him with a detailed preoperative explanation the procedures that are about to take place, he revealed him to be a member of Jehovah’s Witness, and that his religious belief prohibit him from accepting blood transfusion, even though he might bleed to death on the surgical table. It posed a substantial challenge for the surgeons, as the patient’s meager wage could not afford the fee of the da Vinci surgical system.

This patient was the sole provider of his family, Dr. Kuo recalled. Considering the fact that laparoscopy or conventional surgery for prostate cancer have a 20% chance in need of blood transfusion, which poses tremendous risk to the patient; with the da Vinci surgery, the total amount of blood loss is estimated to be 50 to 100 cc. Taken into account the patient’s financial status, the urology team decided to use the department’s emergency fund. The surgery was a success. The patient

returned to his job days after the surgery. It was because of another prostate cancer patient did this story had a happy ending. That patient was a dedicated Tzu Chi volunteer, who received quality care at the urology department in Hualien Tzu Chi Hospital. For that he donated annually to the department to help those in need.

Reduce Postoperative Recovery Time for Children

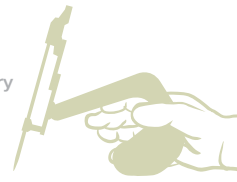
There was a little boy from Taitung, 11 years old, who was born with spinal dysplasia that resulted in protrusion of his spinal cord membrane. He was also born with a tumor on the side of his caudal vertebrae. When the surgeon surgically removed the tumor, several nearby nerves were damaged in the process, which caused the boy's bladder to urinate normally. Although he could still urinate using abdominal pressure, if the boy exerts too much pressure, the urine in his bladder refluxes upward to his kidney, which makes him susceptible to urinary tract infection, and in turn causes acute pyelonephritis.

Every time the boy contracted acute pyelonephritis, fever with chills would follow, and he had to be hospitalized in a local hospital in Taitung for days. The infection grew increasingly frequent in the past few years, so did its severity. The pediatrician of the hospital advised

the parents to consider antireflux surgery to prevent urine from flowing back from the bladder. The parents then took the boy to Dr. Kuo in Hualien Tzu Chi Hospital for treatment. The tests confirmed the presence of neurogenic bladder, poor bladder contraction, high bladder pressure, and signs of urine reflux when urine is build-up in the bladder. Concerned that the boy's kidney function could deteriorate over time, Dr. Kuo recommended immediate surgery.

Considering that the boy was too young, it is possible to perform surgeries on both bladders in one go, but it would take longer to recover. The da Vinci surgery is a viable option, but the boy's father was an electrician with very little saving, and the boy had no insurance beside the national health insurance, so even though he wanted his son to have the minimally invasive surgery he could not afford it, at that instant he burst into tears.

If there is something he can do for the body, he would do his best, Dr. Kuo thought to himself. The da Vinci surgery has advantages that far surpasses traditional surgeries and laparoscopy, but it is a high self-paying surgery as well, even with the departmental emergency fund, the urology department will not be able to cover the expenses of all the cases. To resolve the issue, Dir. Kuo requested the aid of the social service office. In the end,



the hospital, the departmental emergency fund, and the parents would split the fee. The surgery went perfectly. The boy never had any bladder issue to this day.

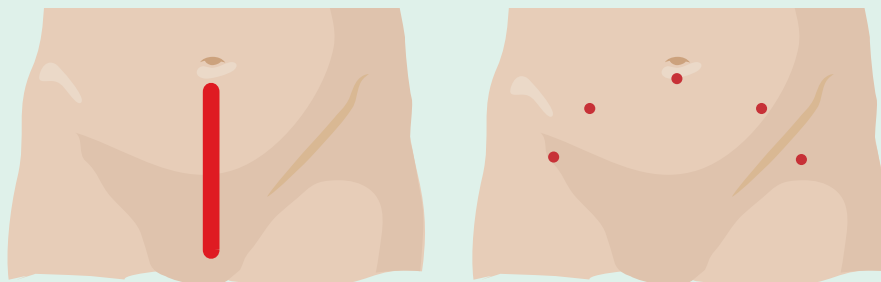
World's Most Advanced Minimally Invasive Surgical System in Eastern Taiwan

The da Vinci surgical system for minimally invasive surgery is the most advanced minimally invasive surgical system in the world. Most major American and European hospitals have adopted the da Vinci surgical system for surgical operations. A total of 3000 sets of the system have been implemented worldwide, performing over 45,000 cases of surgeries every year. The annual growth of surgeries performed is approximately 25%. The system integrated high-tech computers and agile robotic arms that

not only helps surgeons to overcome their physical and mental limitations, but also improved overall surgical qualities too. It has been widely applied in gynecological, urinary system, gastrointestinal tract, cardiovascular, and ENT surgeries. The system has been used in over 1,000,000 surgeries worldwide.

In Hualien Tzu Chi Hospital, all 6 surgical departments, including general, colorectal, cardiothoracic, urology, otolaryngology, obstetrics and gynecology, have access to this innovative medical service. Although it is a self-pay service, the system has, in urology department alone, freed an active 11 year-old boy from a congenital bladder disease. The oldest patient to receive this surgery is 83-year-old who, after been approved by his physician to receive the da Vinci surgery, had his life quality significantly improved after the surgery.

Comparative illustration of prostate cancer surgical incisions



Conventional surgery

da Vinci surgery