



For Immediate Release

Hong Kong Sanatorium & Hospital Introduces Asia's first Robotic Interactive Orthopaedic System for Partial Knee Replacement

(4 September 2012, Hong Kong) – Hong Kong Sanatorium & Hospital (HKSH) today announces the introduction of Asia's first Robotic Interactive Orthopaedic (RIO) System, following the Asia's first surgery performed on 18 June 2012. The RIO System perfects surgical precision in terms of component placement and soft tissue management in joint replacement surgery. This new robot system is used mainly for partial knee replacement (PKR), i.e. for patients with parts of the knee joint damaged and failed non-operative management. In future, RIO System will also be used for patient-specific treatment of hip conditions.

In 2005, HKSH's Orthopaedic & Sports Medicine Centre (OSMC) broke new grounds in total knee replacement surgery by introducing the computer-assisted navigation system (CANS). In Hong Kong, about 10-20% of the population suffers from persistent knee pain and arthritis. While CANS has been widely used for a decade in total knee replacement with satisfactory results, PKR remains tricky due to the often suboptimal positioning of implants. Patients whose knee conditions are not so advanced have to wait until total knee replacement (TKR) becomes a beneficial option.

This year OSMC made another major leap with the acquisition of unparalleled RIO System, which synergises the advantages of both CANS and robots. Surgeons can now achieve high surgical precision with positioning error limited to a minimum of 1 mm or 1 degree. They can assess the soft tissue tension of the knee joint and fine tune the extent of bone cuts, thereby guiding the robot to remove damaged knee bone surfaces accurately. The new technology enhanced precision in PKR and preserved more normal bone and soft tissue, resulting in less trauma and faster recovery.

“It is good news to our patients, especially those who have failed in conservative treatment or whose conditions are far from advanced that require total knee replacement,” said Dr. Joseph Chan, Deputy Medical Superintendent of HKSH. “The introduction of RIO reaffirms our commitment to better serving our patients and to





promoting robotic surgery in Hong Kong.”

Great Precision by Planned and Reproducible Operation

The knee joint is composed of three parts: patellofemoral joint, medial and lateral femorotibial joints. Due to different reasons, the knee joint may be totally or partially damaged. Total knee replacement (TKR) can be performed if the whole joint is affected and other treatments have failed. Partial knee replacement (PKR) can be considered as one form of treatments if part of the joint is deranged.

Dr. Stephen Wu, Director of Department of Orthopaedics & Traumatology, “RIO is best for treatment of the partial knee joint damage or destruction, such as degenerative arthritis of the knee, osteonecrosis of the femoral condyle, and post-traumatic knee arthritis. The problem with PKR in the past, i.e. suboptimal positioning of implant, is now solved by the high surgical precision of the RIO System, which sheds new hope to many patients.” For global knee joint damage such as advance osteoarthritis of the knee, inflammatory knee arthritis, and infected knee conditions, TKR may be a better option.

In the past, PKR was not generally practised by orthopaedic surgeons mainly because the implants positioning is often suboptimal which may affect the long-term outcome of the operation.

The RIO System synergises the advantages of both CANS and robots to achieve high precision and accuracy during surgery. The error in positioning assessment can be as low as less than 1 mm or 1 degree. Before the PRK using RIO, the patient has to perform a CT scan of the knee. The information is then analysed by special software in the system computer to generate a 3D model of the knee. Based on these data, surgeon can formulate pre-operative planning to ensure accurate positioning of implants.

The 3-D visualisation guides the surgeon in controlled resurfacing of the problematic part of the knee, capable of saving as much healthy bone as possible. While the surgeon is manipulating the burr and removing the bone as planned by the computer, real-time visual, tactile, and auditory feedback facilitates ideal implant positioning





and placement. They can assess the soft tissue tension of the knee joint and fine tune the extent of bone cuts, ensuring the smooth functioning of the joints with implants in different angles such as straightening and bending the knee. Dr. Tang Wai Man, Specialist in Orthopaedics and Traumatology, “RIO is a robot which is also interactive in assisting the surgeon in operation. The force-controlled tip of the rotating burr is limited to move within the confines of the pre-defined cutting zone, preventing excessive bone removal. And the burr will stop automatically if the surgeon goes outside the pre-determined cutting zone.”

Fast Recovery with Minimal Tissue Trauma and Maximum Bone Sparing

Robotic PKR is relatively minimal invasive, which means smaller wound, less pain and faster recovery after operation compared with conventional surgery. The computer-guided RIO System can achieve precise soft tissue balance and allows accurate positioning of implants, which means less knee bone and soft tissue is removed while all normal ligaments and parts are preserved. It would also be easier for patients to have TKR in the future if required.

Mr. Wong is the first patient in Asia to undergo PKR surgery with the RIO System. He has been suffering from knee pain for two years, and couldn't walk for more than 15 minutes without pausing to rest. Mr. Wong expressed after the surgery, “I am still in the process of recovery and undergoing physiotherapy, but I can now walk for half an hour without stopping. It makes me feel the way I did in my 20s.”

Ms. Cheung, Ms. Poon and Ms. Cheng are all amongst those burdened with years of knee pain for an array of reasons. However, they all supposed that nothing could be done to solve the problem until years later, when their knees have completely degenerated. “I hurt my knee when travelling in 2004. In recent years, I can barely raise my leg to take a step. When I found out about partial knee replacement surgery, I decided to go through with it right away. I can now enjoy the freedom to move about, and even go up and down the stairs. I am still in recovery though, so I do need to lean on desks or chairs when I kneel down or get up,” says Ms. Cheung.

Ms. Poon also shared her experience. “The doctor said I had Avascular Necrosis, but parts of my joints were still intact. Partial knee replacement surgery can attain



maximum bone sparing, while helping to speed up the resumption of mobility in the implanted joint.” Ms. Cheng adds, “At first, my knee only ached a little bit when I tried to straighten my legs. But last year, the pain got so bad that I could barely walk. Alas, I found myself getting out of bed and taking my first steps two days after surgery. It’s been just over two months now, the wound still hurts a little bit, but I can shop for three hours with no problem at all.”

Ms. Yeung and Ms. Lei both had knee replacement surgery in one knee before undergoing RIO partial knee replacement in the other knee. Ms. Yeung had TKR surgery in her right knee last year, due to the severity of her condition. “I am not getting any younger, so I was quite worried about this surgery after the painful total knee replacement surgery I had last year. But this time it turned out very smoothly, and I was able to start walking the day after the surgery.”

Ms. Lei had conventional PKR surgery in her right knee five years ago in a public hospital. A third of her right knee was replaced last time, and two-thirds of her knee joint (along with the knee) was replaced in this surgery. She commented, “The wound is smaller and recovery was speedy after this surgery, compared to five years ago. I am beyond satisfied.”

Superb Expertise in HKSH Towards Era of Precision Surgery

Dr. Wu and Dr. Tang visited the Robotic Joint Surgery Centre and the System’s manufacturer in the US in March 2012. After seeing surgeons using the new technology at first hand and attending the special training courses, the Doctors introduced the RIO System to the Hospital with the support of HKSH Management, thereby further broadening the horizon of local robotic orthopaedic surgery.

The orthopaedic surgical team of HKSH has attained a high level of surgical skills in the application of RIO in PKR surgery. From 18 to 20 June 2012, the Orthopaedic and Sports Medicine Centre conducted a 3-day training course on robotic knee replacement for local orthopaedic surgeons. There were live surgical demonstrations, lectures and hands-on training of the new RIO robotic system. By August 2012, Dr. Wu and Dr. Tang had successfully performed partial knee replacements using the robotic system for 8 patients.





“The fact that this new technology was brought in within three months stands proof once again to HKSH’s continual commitment to introducing state-of-the-art medical technology, benefiting both doctors and patients in the spirit of our motto, ‘Quality in Service, Excellence in Care’,” commented Dr. Joseph Chan, Deputy Medical Superintendent of HKSH. “With the introduction of the first RIO System in Asia, we not only get to witness orthopaedic advances first hand, but will also strive forward with the rest of Hong Kong to embark on a new era in robotic orthopaedic surgery.”

About Orthopaedic and Sports Medicine Centre

The Orthopaedic and Sports Medicine Centre is established on 5th March 2004 in the Hong Kong Sanatorium & Hospital. It was the first and only facility in Hong Kong's private hospitals, in response to the demand for comprehensive services in orthopaedics and sports medicine. It aims to provide complete health care and preventive treatment for a variety of disorders, including trauma and tumours. The Centre is managed by orthopaedic specialists who are leading experts in such fields as tumour management, hand, upper limb and microsurgery, sports medicine, joint replacement and spine. The Centre also works closely with the Physiotherapy Department to design training and rehabilitation programmes for patients to restore physical capabilities.

About Hong Kong Sanatorium & Hospital

Hong Kong Sanatorium & Hospital is one of the leading private hospitals in Hong Kong. With the motto “Quality in Service Excellence in Care”, the Hospital is committed to serving the public as well as promoting medical education and research.

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Photos:

1. Hong Kong Sanatorium & Hospital (HKSH) introduced Asia's first Robotic Interactive Orthopaedic (RIO) System, now mainly for partial knee replacement (PKR), greatly enhancing the surgical precision and outcomes and durability of implants.



2. Dr. Joseph Chan, Deputy Medical Superintendent of HKSH, remarked that “The introduction of RIO system reaffirms our commitment to better serving our patients and promoting robotic surgery in Hong Kong.”



3. Mr. Wyman Li, Manager (Administration) of HKSH (third from right), Dr. Joseph Chan, Deputy Medical Superintendent of HKSH (second from right), with Dr. Stephen Wu (third from left), Dr. Tang Wai Man (second from left), Dr. Jimmy Wong (first from left) and Dr. Mak Kan Hing (first from right) from the Department of Orthopaedics & Traumatology.



4. Dr. Tang Wai Man, Specialist in Orthopaedics and Traumatology, explained the causes and treatments of osteoarthritis.



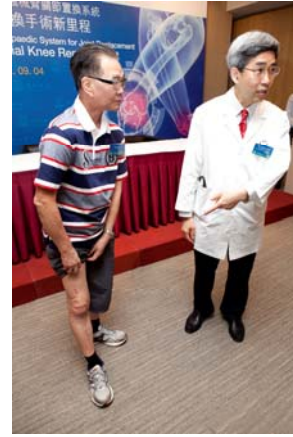
5. Dr. Stephen Wu, Director of Department of Orthopaedics & Traumatology, introduced the Robotic Interactive Orthopaedic (RIO) System and its groundbreaking use for partial knee replacement.



6. Since June 2012, 8 patients successfully received partial knee replacement using RIO system at HKSH, and 6 of them were present to share about their experiences.



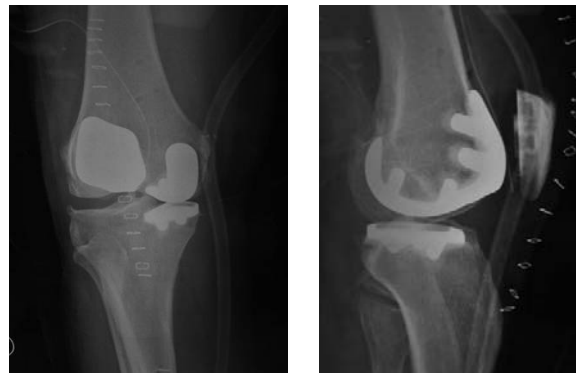
7. Hong Kong Sanatorium & Hospital performed Asia's first partial knee replacement with RIO System on 18 June 2012, and Mr. Wong was the first patient in Asia.



8. Pre-operation / Post-operation



Pre-operation



Post-operation



9. Live demonstration of Robotic Interactive Orthopaedic (RIO) System: The 3-D visualisation guides the surgeon in controlled resurfacing of the problematic part of the knee. The burr will stop automatically if the surgeon goes outside the pre-determined cutting zone.

