GP IN-SYNC

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GP Appointment
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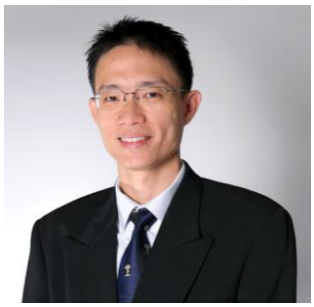
Specialist in Focus



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Dr Andrew Lim graduated with his MBBS degree from the University of Melbourne in 2001. He obtained his early working experience with Queensland Health in Australia before returning home to Singapore in 2005 to commence his surgical training.

He was conferred the MRCSEd in 2007 followed by the NUS Master of Medicine (MMed) degree in 2008. He completed his advanced specialist training and FRCSEd (Orth) in 2011.

In 2012, Dr Lim was awarded a one-year fellowship program at the Royal Liverpool Children's Hospital in the United Kingdom where he gained invaluable experience in paediatric orthopaedic surgery.

Dr Lim specialises in the treatment of lower limb deformities in children.

Clinical Updates

Modulation of the Growth Plate around the Knee in Children

Children with limb length discrepancy or angular deformities around the knee have traditionally been treated with stapling or ablation of the growth plate. The timing of surgical intervention is crucial to avoid under- or over-correction of the condition.

More recently, a temporary reversible tether of the growth plate by the use of a device called an *8-plate*[1] has gained popularity. The *8-plate* produces a tension band restraint to the growth plate across which it is placed.

Figure 1. 8-plate with two screws

In the case of an angular deformity at the knee joint, such as non-physiological genu varum or valgum, the *8-plate* is placed across the growth plate on the convex side of the deformity, termed hemiepiphysiodesis, through a small skin incision.

This allows the growth plate on the concave side to "catch up" over time. This concept of guided growth restores the normal alignment of the knee gradually, upon which the *8-plate* is then removed.

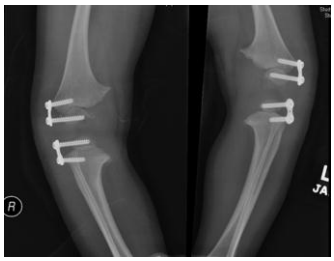

Figure 2. X-ray showing 8-plate hemiepiphysiodesis for bilateral genu varum

In the case of limb length discrepancy, the *8-plate* is placed across the growth plate on the lateral and medial side of the knee on the longer extremity, termed epiphysiodesis. This allows gradual limb equalization of the shorter extremity following which the *8-plates* are removed.

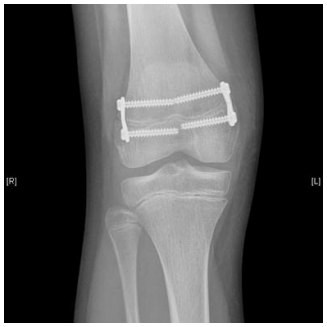

Figure 3. X-ray of the knee showing 8-plate epiphysiodesis

Reference:

1. Stevens PM. Guided growth for angular correction: a preliminary series using a tension band plate. J Pediatr Orthop. 2007 Apr-May;27(3):253-9.

GP Liaison Centre (GPLC)

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Specialist in Focus

Dr Gurpal Singh

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Dr Gurpal Singh is an Orthopaedic surgeon specialising in musculoskeletal oncology, hip and knee disorders, joint replacement and sports injuries.

Dr Singh graduated from the National University of Singapore in 2004 with a Dean's list award and gold medal and thereafter went on to pursue higher surgical training at the Royal College of Surgeons of Edinburgh, UK from 2006-2011. He completed his advanced specialist training in Orthopaedic Surgery in 2011 and was awarded the inaugural College of Surgeons Gold Medal for being the top candidate in the FRCSEd (Orth) examination.

Dr Singh was awarded the Ministry of Health Scholarship for advanced specialty training and he moved to Germany for 2 years to work with world leaders in Musculoskeletal Oncology and Hip and Knee Surgery. He has completed 2 one-year fellowships at the Otto-von-Guericke University, Magdeburg, and at University Hospital Muenster, Germany.

Dr Singh's clinical practice consists of musculoskeletal tumours (benign and malignant), joint replacement (hip and knee), complex reconstructions of the hip and knee, and arthroscopic surgeries of the hip and knee including sports injuries.

Clinical Updates

How long will my joint replacement last?

Increasing life expectancy coupled with the exponential rise in numbers of joint replacement surgeries being performed worldwide has brought to light a new set of challenges related to implant survival and longevity.

Every patient wants to know how long the artificial joint prosthesis will last and whether there will be a need for revision surgery during his or her lifetime. There is a subset of patients with metal allergies and severe arthritis who need joint replacement. Some patients develop hypersensitivity reactions to certain components of the metallic alloys, nickel being the most common.

There is therefore a need to improve biomaterials, understand how the body reacts to periprosthetic wear debris and minimise these adverse biological responses. In addition, the Asian patients present unique size and anatomical considerations and the use of implants designed for the western population sometimes presents challenges.

To address these issues, Dr Singh collaborates internationally with a team of experts from Europe comprising orthopaedic surgeons, immunologists, material scientists, engineers and industry partners in an effort to improve biomaterials, increase the lifespan of artificial joint prostheses, reduce infection rates and minimize adverse tissue responses from the patient's body.

Some of the technological advancements in biomaterials and prosthesis design which Dr Singh is involved in include the use of new generation ceramics and antioxidant coated/infused highly-cross linked polyethylene in joint replacement, hypoallergenic (coated) implants for the patient with metal allergies, 3-dimensional printing and customised joint replacement.

Dr Singh has published extensively in this field. He is invited to lecture in Australia, Europe and Asia on these challenging issues and is part of the ASTM committee, an international standards organization regulating medical devices.

Case example:

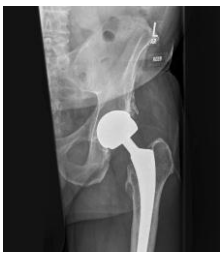

Figure 1. Severe early, progressive osteolysis seen in acetabulum and proximal femur as a result of adverse periprosthetic tissue response to metallic wear debris in patient with a large head metal hip replacement

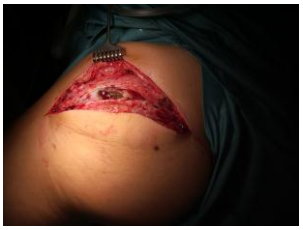

Figure 2. Intra operatively, there was a "pseudotumour", which had formed as a result of adverse reaction to metallic debris, and was almost pointing through the skin, resembling an abscess

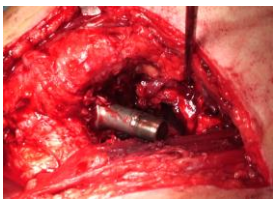

Figure 3. The source of the debris was not from the articulating surface, but corrosion and wear at the head-neck modular junction of the prosthesis. This patient has high serum cobalt ion levels and organ dysfunction as a result which reversed once the prosthesis was revised to a ceramic articulation.

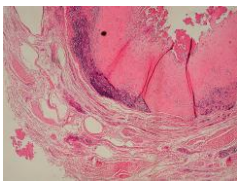

Figure 4. Histopathology slide, showing perivascular and diffuse lymphocytic infiltration in the periprosthetic tissues of this patient.

Shaping Medicine for the Future

CME Registration: https://nuhcme.com.sg/

Clinical Highlights

Targeted therapies treat cancer with fewer side effects

Smart drugs allow personalized treatments that hit aggressive breast & lung cancers at molecular levels

SINGAPORE — Mention cancer treatments, and chemotherapy and radiotherapy — along with their harsh side effects such as hair loss, vomiting and low blood count — usually come to mind.

Not anymore. A new generation of "smart drugs", known as targeted therapies, is changing the way cancer is being treated.

Only this year alone, new targeted therapies have been made available for local patients suffering from HER2-positive metastatic breast cancers and late-stage lung cancer with epidermal growth factor receptor (EGFR) mutations.

In Singapore, lung and breast cancers were the top cancer killers among men and women, respectively, from 2008 to 2012, said the National Disease Registries Report.

Unlike conventional cancer treatment such as chemotherapy, which affects rapidly dividing cells in the body, these smart drugs target only specific mutations in cancer cells, said Dr Tan Sing Huang, Senior Consultant at the Department of Haematology-Oncology at the National University Cancer Institute, Singapore (NCIS).

"Targeted therapies are more selective than chemotherapy in that they are less likely to affect the surrounding normal cells while in the process of attacking cancerous cells," she said.

"Instead, they interrupt the pathways that are involved in the growth and spread of cancer to slow or halt cancer progression."

Dr Tan Sing Huang explained that some of these targeted therapies work by using antibodies to attack certain receptors on the cancer cells.

In addition, there are drugs which work by using small molecules to enter the cancer cell and disrupt it. There are also other drugs that prevent new blood vessels in the tumour from forming, thus starving the tumour of blood supply.

KEEPING BREAST CANCER CELLS UNDER CONTROL

"About one in five breast cancer cases in Singapore is HER2-positive. HER2-positive cancer possesses an excess of HER2 receptors on the cancer cell surface, which can lead to uncontrolled and more aggressive cancer growth," said Dr Tan Sing Huang.

The new smart drugs, pertuzumab and trastuzumab emtansine, are designed to target these HER2 receptors and are administered via intravenous infusion.

"Before the era of targeted therapies, HER2-positive metastatic breast cancer patients were limited to traditional chemotherapy and anti-hormonal drugs. Patients with this disease had a very poor prognosis," said Dr Tan.

"However, targeted therapies against HER2 have altered the natural course of the disease. Patients' survival has been significantly extended."

BLOCKING MUTATED LUNG CANCER GENES

Similarly, a new targeted therapy, afatinib, has improved survival outcomes for patients suffering from late-stage lung cancer with the EGFR gene mutation.

The oral tablet is the latest EGFR-TKI (tyrosine-kinase inhibitor), which works by blocking the actions of the mutated EGFR gene, thereby blocking the growth and spread of the lung cancer cells.

Two large-scale Phase 3 trials have shown that patients treated with afatinib lived for almost a year before their tumour started to grow again, compared with over half a year for those on chemotherapy, said Dr Tan Yew Oo, Consultant Medical Oncologist and Haematologist with Singapore Oncology Consultants.

The EGFR gene mutation is found in about six in 10 patients who do not smoke or are light smokers.

This particular type of lung cancer is three times more common among Asians, compared with our Western counterparts, added Dr Tan Yew Oo.

MORE TOLERABLE SIDE EFFECTS

As a result of its selectivity, one of the main advantages of targeted therapy is that patients experience fewer or more tolerable side effects.

Dr Tan Sing Huang commented: "In comparison, chemotherapy affects rapidly dividing cells. It not only affects cancerous cells, but also other normal cells in the body such as our bone marrow, hair cells or the cells lining the gastrointestinal tract."

Dr Tan Yew Oo added: "For instance, patients on chemotherapy for lung cancer may experience harsh side effects including nausea, vomiting, hair loss, low blood count, bleeding and infections."

"On the other hand, those on the new EGFR-TKIs may have rash, nail changes, diarrhoea, skin discolouration and changes in liver function tests, which are generally better tolerated."

The experts are optimistic about personalised cancer treatments. Dr Tan Yew Oo: "We are at the dawn of an era where we can personalise treatment and design new drugs by looking for new molecular targets in the cancer.

"We can now better understand how these cancers grow and spread, and how to kill the cancer cells based on their particular characteristics."