

Department of Orthopaedics & Traumatology



Queen Mary Hospital



The University of Hong Kong Medical Centre

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Message from the Editorial Board

Happy New Year! Time flies. It's been nearly 10 years since we first published our *Newsletter*. We have introduced some new features to our newsletter since the last issue. Apart from the *General Article* which covers the general topics in orthopaedics, for example, approach to knee swelling, we have added a *Featured Interview* of our local experts and also the *Cutting Edge Development* in orthopaedics. We hope that the interview can provide a mean for the local experts to share their visions in the development of orthopaedics. The *Cutting Edge Development* will hopefully bring you some highlights of the latest development in a particular subspecialty. We have also introduced the *Residents' Corner* to let the residents share their experience in the international conferences or training courses they attended. We hope you may find the "new" *Newsletter* more enjoyable and educational.

Cervical Spondylotic Myelopathy

Dr. KH Leung / Dr. WY Cheung

"Doc! My hands are numb and I have difficulty using my chopsticks... Do I have cervical myelopathy?"

Cervical spine degeneration may lead to protrusion or bulging of inter-vertebral disc, thickening and buckling of ligamentum flavum, osteophytes at the vertebral bodies and inter-vertebral joints which may cause narrowing of the spinal canal and compression to the spinal cord, resulting in spinal cord dysfunction (Fig 1). This clinical condition is known as cervical spondylotic myelopathy. The annual incidence was reported to be 5.6 per 100000 people with male to female ratio of 2: 1. It commonly affects patients at the 6th or 7th decades. Patients usually complain of progressive numbness, clumsiness and weakness of upper and/or lower limbs. Fine hand functions such as writing or using chopsticks are commonly affected. Patients may also have unsteady gait due to lower limb weakness, spasticity and poor coordination. For more severe cases, patients may even lose urinary and bowel control.



Fig 1: Mid-sagittal cut MRI shows bulging inter-vertebral discs and thickening of ligamentum flavum causing stenosis at multiple levels

Physical examination shows signs of cervical myelopathy including sensory loss, motor weakness, brisk jerks and myelopathic hand signs. Myelopathic hand signs commonly refer to 10 second test, Hoffman sign and finger escape sign. The ten-second test is demonstrated by asking the patient to flex and extend his/her fingers as fast as possible in ten

seconds. Normal person can achieve more than 20 cycles. The Hoffman's sign is elicited by flipping the distal phalanx of the middle finger while the wrist and metacarpophalangeal joints are extended and the proximal interphalangeal joint is immobilized. It is positive if opposition of the thumb and index finger is observed. The finger escape sign is positive if the small fingers cannot maintain adduction with the wrist in neutral position, the metacarpo-phalangeal and the interphalangeal joints fully extended.



Fig. 2 (left): X-ray cervical spine after anterior decompression and anterior spinal fusion at C5/6

Fig. 3 (right): X-ray after posterior decompression with opening of laminae from C3-C7 (laminoplasty)

Investigations include X-rays and MRI of cervical spine. X-rays may show mal-alignment of the cervical spine e.g. loss of cervical lordosis, spondylolisthesis or retrolisthesis, congenitally narrow spinal canal, osteophytes at the vertebral bodies, uncovertebral joints and facet joints. Flexion and extension views may demonstrate cervical instability. MRI is useful to delineate the

site of spinal cord compression and to exclude other cervical pathologies which can present similarly.

Non-operative management is generally non-effective for patients with cervical spondylotic myelopathy and the disease is progressive in nature. Surgery should be considered for patients with moderate to severe disease. Japanese Orthopaedic Association Score for cervical myelopathy is commonly used to assess the severity of the myelopathy. Surgery is generally recommended for patients score less than 13 points. The aim of the surgery is to decompress the spinal cord so as to stop the progression of the myelopathy and to obtain neurological

improvement. This can be achieved with anterior or posterior surgical procedures. Anterior procedure removes the offending inter-vertebral disc and osteophytes to decompress the spinal cord. The void created after decompression is filled with bone graft for spinal fusion (Fig 2). Posterior procedure opens the laminae of stenotic segments posteriorly to decompress the spinal cord (Fig 3). The choice of surgery depends on number of stenotic levels, presence of cervical kyphosis, surgeons' training and expertise. About 80% of patients will have significant neurological improvement after surgery.

Cutting Edge Development

Genetic Research in Orthopaedics

Thanks to the advancement of computer technology and molecular engineering, genetic analysis has taken a quantum leap in the past 20 years. With the completion of the Human Genome Project in 2003, the secrets of the three billion nucleotides that make up the human genome begins to unlock. The two common methods that are used to map genetic variants are the positional cloning (linkage analysis) and candidate-gene approach (association studies). The positional cloning approach uses an allele of a polymorphic marker of known location to identify the gene of the inherited disease. This is helpful in mapping single gene "Mendelian" diseases. The candidate gene approach investigates the association between a set of suspected alleles of a gene with the disease using a variety of statistical tests. In general, candidate gene approach is considered more superior in studying complex and multifactorial diseases.

A large databank collecting hundreds of orthopaedic diseases caused by a mutation in a single gene is now available in the "Online Mendelian Inheritance in Man" located in the National Library of Medicine website. As our knowledge of the molecular



biology improves, there is more breakthrough in studying complex and multifactorial diseases e.g. osteoarthritis (OA) and degenerative disc disease (DDD). Linkage studies have identified a number of predisposing genes of osteoarthritis e.g. COL9A1 (6q12-q13), BMP5 (6p12.1) and IL1R (16p12.1-p11.2). They either affect the structural properties of the protein (IL1R) or the transcription of the gene (BMP5 and COL9A1). Similarly, a number of susceptibility genes of DDD have been identified.

These genes code for extracellular matrix (ECM) present in the cartilage and are responsible for the mechanical properties of intervertebral discs, e.g. type IX collagen (COL9A2 and COL9A3), aggrecan (AGC1) and cartilage intermediate layer protein (CILP).

Is Osteoarthritis (OA) related to the Degenerative Disc Disease (DDD)?

Association of Asporin D14 allele with Lumbar Disc Degeneration in Asians

You-Qiang Song, Kenneth MC Cheung, Daniel WH Ho, Sandy CS Poon, Kazuhiko Chiba, Yoshiharu Kawaguchi, Yuichiro Hirose, Mauro Alini, Sibylle Grad, Anita FY Yee, John CY Leong, Keith DK Luk, Shea-Ping Yip, Jarmo Karppinen, MD, Kathryn SE Cheah, Pak Sham, MD, Shiro Ikegawa, and Danny Chan

Am. J. Human Genet. Mar 2008

Song, Cheung et al. in their publication, *Association of Asporin D14 allele with Lumbar Disc Degeneration in Asians*, suggested that the two diseases may share some common pathways. Recent studies have shown that an aspartic acid (D)-repeat polymorphism in the gene encoding asporin (ASP) is associated with osteoarthritis, in particular the D14 allele. ASP is an ECM that belongs to the small leucine-rich proteoglycan (SLRP) family. It contains a unique aspartate (D) residues repeat in the N-terminus. The D14 polymorphism with 14 D residues is the risk allele identified for osteoarthritis. ASP interestingly does not provide any mechanical support to the discs. Instead, it inhibits in vitro chondrogenesis and expression of COL2A1 and AGC1 through inhibition of TGF- β expression.

Song, Cheung et al demonstrated that ASP's expression in the intervertebral discs was up-regulated with age and in degenerated discs. The association of ASP with lumbar disc degeneration (LDD) in Chinese and Japanese were also significantly high. The author therefore concluded that ASP is a LDD gene in Asian. Even though the actual pathway is not yet determined, the association of ASP with both OA and LDD suggests that there may be a common molecular pathway leading to the degenerative process. This is the first study demonstrating this common molecular basis between these two diseases.

A Chat with Prof. Kenneth Cheung

Evelyn Kuong

"...I think people could be taking a pill that could stop the disc from degenerating..."



What is your view of the role of genetic research in the field of orthopaedic surgery?

It is becoming clearer by the day that genetic research is very important in orthopaedic surgery. In the days when I was in medical school, we were only talking about rare single gene diseases such as osteogenesis imperfecta. However, it is now apparent that many diseases such as diabetes mellitus are not only caused by single genetic mutation, they involve multiple genes. There is also an element of interaction with environmental factors to result in the final disease.

We now have the advantage of having the Human Genome Project which has mapped out the entire genome of the human being. Not only did it provide a comprehensive genetic map for our research, it also provided new technologies. What used to take months to do, such as gene sequencing, can now be done in one day. Nonetheless, this is just the beginning. After having found the genes, the next step is to enter the era of genomics and proteomics. As diseases are a product of genetic mutations and their resultant mutated proteins or the lack thereof, we need to study the function of these genes and proteins to understand their underlying molecular mechanism.

Have these advances in genetic research aided your work in degenerative disc disease?

They certainly have. Not only have they allowed us to confirm others findings that genetics is a possible cause of disc degeneration, we have been able to find new genes that have never been discovered before! We are now proceeding onto genomics studies. Firstly, we are creating these gene mutations in mice. Although mice do not stand on two legs like humans and their vertebral discs are slightly different in terms of structure, they do have many advantages. They reproduce quickly and can therefore give us much information in a short period of time. Secondly, we are collecting samples of human discs after each of our operations and studying them in detail. With the mice, we see the beginning of the genetic mutation's pathway, while with the human disc samples, we are seeing the end of the degenerative pathway. With this, we try to study what happens in between these two points and develop targeted therapy. More precisely, we need to develop a rational therapy. All of the surgeries that we are performing at the moment for degenerative disc disease result in fusion of the spine. For a structure that was designed to move, this treatment is irrational. It is time that we develop new treatments that can preserve spinal motion.

What is the secret to forming a team that is the world leader in research in degenerative disc disease?

We have world-class facilities in genetic research within the faculty and the university with the formation of the Genome Research Center. In the field of research on the spine, we have a dynamic multidisciplinary team of scientists, clinicians and engineers all interested in the intervertebral disc. This is particularly important in modern day cutting edge research. As a result of this team, we were able to obtain the Area of Excellence Grant from the University Grants Committee of HK \$50 million. Part of that funds the genetics research on the intervertebral disc. We have also collected the largest population database of MRI and genetic information on the spine in the world. This has made us a world leader in this area!

What impact do you think your research in degenerative disc disease will have on the world?

As a result of this massive database of new information, we have made new and original clinical and genetic discoveries on degenerative disc disease, some of which are being written for publications. This will likely change our traditional beliefs on low back pain and degenerative disc disease. Our leadership position is underlined by the fact that I have just recently and successfully organized and chaired a World Forum on Spine Research in Kyoto, where we invited some 70% of the top researchers on the intervertebral disc to share knowledge on this topic.

So, in short, what is your vision for genetic research in orthopaedic surgery?

I hope that it can bring new understanding of the disease and help develop non-invasive or minimally-invasive rational biological therapy.

You have quite a remarkable career for someone so young. What do you think are the key factors to your success?

I believe that you must always position yourself to be able to seize the opportunities that are presented to you. It is impossible to plan your career ten years down the road and you must take it a step at a time. Nevertheless, you must always prepare yourself for when opportunities arise.

The first opportunity that came my way was working for this department. I studied medicine and did my FRCS in England and actually had no plans of ever coming back to Hong Kong. However, I happened to be on holiday in Hong Kong in the winter of 1991. It occurred to me at the time that many surgeons took sabbaticals abroad. So after a conversation with Professor John Leong, I was officially hired and started working at Queen Mary Hospital the following year. It was initially supposed to be a one-year-stint, but I started working here in 1992 and I have been here ever since.

The second opportunity comes to mind was my encounter with Professor Kathryn Cheah. Many years ago, Professor SP Chow sent me to talk to this biochemist who "kept going on about mice". Our work together began with fractures and soon evolved to further

studies on the spine. Over the years, her help has been essential in my research and we wouldn't have made the advances that we have made without her support.

The most recent significant opportunity that I can recall is the Areas of Excellence Grant of fifty million dollars. There are extremely stringent criteria for the government's selection for the recipients of this grant. It is a significant recognition of our achievements so far and I am certain that it will aid our vision in the future of our research.

So how do you manage to balance your career life with your family life?

Please visit our website for the full coverage of the

Residents' Corner

AO PRINCIPLE & ADVANCED TRAUMA COURSE DAVOS 2007

CHRISTIAN FANG / EVELYN KUONG / KH LEUNG

Davos: an equivalent for Mecca in the orthopaedic trauma surgeons' language. My pilgrimage to this scenic and placid countryside town located in Switzerland last December was definitely most educational while thrilling.

Let's first talk about the fun part. The town is actually a huge Alpine playground interconnected by some 300 kilometers of ski paths. There is nothing much to do except attending your courses and skiing. "Play safely..." I repeatedly have to remind myself to resist the temptation for exploring that another new slope. And luckily I was able to avoid the humiliating irony for having to be treated for a fracture! A typical day in the mountains looked like this:

The AO courses held annually represents a pinnacle opportunity to learn directly from world class experts, proudly, also including 3 members from my department. The core materials taught are greatly in-depth and are almost regarded generally as the 'gold standard'. Small group case discussions provide ample opportunity to share with surgeons and trainees alike around the world, so learning is bi-directional. Practical sessions ensure that we get hands-on experience on the state-of-art technology, no matter how expensive the implants.

What impressed me the most was a homogenously outstanding presentation delivered by every single speaker. You never need caffeine even though a day combined is more than 8 hours long. According to the organizers, utmost attention was paid to rehearsal and meticulously designing the content so participants can never have a chance to fall asleep.



TIPS FROM OUR ALLIED HEALTH

Occupational therapists of Queen Mary Hospital

Fall Prevention of Elderly at Home

Elderly fall is undoubtedly a big issue. A lot of effort and time have been invested to try to combat this common problem with a view to avoiding or minimizing the impact of the consequences brought about by fall. A local study on falls in community dwelling elderly people in Hong Kong (Chu et al 2007) showed that 47% of falls occurred indoors and the environmental risk factors showed significant association with falls at home. Therefore, safety at home is an important area of focus to reduce fall.

Top Ten Fall Risk Factors for Elderly Living at Home

In a survey done in 2002 by occupational therapists working in local HA hospitals, it revealed that the top ten risk factors of fall identified during home visits to elderly patients residing at home were as follows:-

1. Improper transfer techniques used in toileting or moving from bed to chair
2. Poor stability of chairs and seating
3. Hold onto loose or unstable furniture for support during toileting or transfer
4. Lack of stable support during toileting and bathing
5. Slippery floor in living room, kitchen and toilet
6. Overconfidence in own ability in performing ADL
7. Inadequate ability in performing Instrumental ADL
8. Inappropriate use of walking aids
9. Narrow passage way or with obstacles blocking passage
10. Unable to manage kerb at door entrance

The risk factors include both environmental and behavioural aspects since home safety does not imply only a safe

environment but also a safe interaction or functioning within the environment.

Common Assistive Device

One of the options to promote home safety is the use of assistive device. Some common and useful assistive devices to promote safety and function when elderly people carry out self-care activities within the bathroom are bathboard and toilet safety rails. For those elderly with severe osteoporosis, hip protectors can also be considered to reduce the impact of falls.



Hip Protector

Toilet Safety Rail



Bathboard with handle

AO GERIATRIC FRACTURE MANAGEMENT COURSE

25-27 JANUARY 2008

This three-day course is the first AO geriatric fracture management course held in Asia. The three previous ones were held in USA and Europe. Apart from the renowned local speakers Dr. Frankie Leung (Course Chairman), Prof. SP Chow, Dr. TW Lau, Dr. SW Law, Dr. Wilson Li, and Dr. WY Shen, speakers of other disciplines - Prof. Annie Kung (endocrinologist), Dr. TP Ip (geriatrician) and Dr. HT Chan (anaesthetist) were invited to make this a comprehensive and multidisciplinary course. Prof. Robert McCann (USA) and Dr. Stephen Kates (USA) shared their experience in the co-management of orthogeriatric patients; Prof. Michael Blauth (Austria) highlighted the latest techniques of the bone quality assessment and the use of the DensiProbe as an intra-operative bone density assessment tool; Prof. Suthorn Bavonratavech (Thailand) and Dr. G On Tong (Singapore) illustrated the fixation principles in geriatric fractures. Six practical exercises were organized so that the course participants could acquire the skills on using various types of locked implants in different anatomical regions.



VISITING FELLOWS OF THE DUCHESS OF KENT CHILDREN'S HOSPITAL

Over the years, many overseas orthopaedic surgeons have visited the Duchess of Kent Children's Hospital at Sandy Bay for the fellowship program. They come here for different specialty training – hand, paediatrics and spine. Many of them are now very experienced consultants or renowned professors in their countries. Many great friendships have started since then...

The son follows his father's footsteps...

"Time flies. It is now more than two years since I joined my fellowship in DKCH. I had a very good time in Hong Kong. I could brush up my surgical skills, improve my knowledge in spine surgery and concentrate in research activities. I am most impressed by the friendly working environment in DKCH where people respect each other. My father, Dr. Yoshiharu Takemitsu is also a DKCH fellow back in 1964. He often talked to me about his fond memory of DKCH in my childhood. My father was very happy when he heard about my plan of going to DKCH for my fellowship. I have a son who is 9 years old. If he ever becomes an orthopaedic surgeon, I will definitely recommend him to go to DKCH."

- **Dr. Masakazu Takemitsu from Japan**



Dr. Yoshiharu Takemitsu (left) and Dr. Masakazu Takemitsu (right)

Once an apprentice, now a master...

"I know the Fellowship from my senior, Prof K El-Adwar, who joined the DKCH pediatric fellowship in 1995. He encouraged me to apply. Definitely, my family and I have enjoyed much. I have gained much experience in pediatric orthopedics and spine surgery. Moreover, I am very honored to be involved in 8 research projects during my stay in Hong Kong. In El-Hadra University Hospital, the place where I work in Egypt as a clinical lecturer, we do not have a gait laboratory. It is definitely useful in the clinical analysis for patients with cerebral palsy."

- **Dr. Tarek Fiky from Egypt**



Dr. Tarek Fiky with his family

大口環根德公爵夫人兒

An old friend across the ocean...

Dr. Richard Buxton is a consultant working in England. He came to DKCH in 1981. He has recently launched a **Clinicopathological** Website which is very informative and educational. Please visit the website:

<http://www.buxtoncd.rcsed.ac.uk/>



5th Hong Kong International Orthopaedic Forum The New Frontiers

19-20 April 2008

Early Bird Registration: 18 March 2008

Many new procedures, implants and instruments have been developed in the past decade. Our department has planned a compact two-day program, which includes instructional course lectures and symposia on the "New Frontiers". International speakers include *Prof R Ganz, Prof. KH Yang, Dr. T Byrd, and Dr. A Yeung*. Highlights include hip arthroscopy, periacetabular osteotomy updates, osteoporotic fracture management, minimally invasive spine surgery and stem cell therapy.

Please visit our website for further information: <http://www.hku.hk/ortho/ortho/5hkiof.htm>

Endoscopic Foraminal Spine Surgery Workshop

21-24 April 2008

This 4-day workshop covered the general principles, applied anatomy and technical considerations in endoscopic foraminal spine surgery. The Workshops will cover: 1) Simple lumbar selective endoscopic foraminal discectomy, 2) Difficult endoscopic lumbar discectomy and endoscopic thermal annuloplasty, 3) Endoscopic foraminoplasty and 4) Endoscopic foraminal decompression for difficult lumbar stenosis.

Please visit our website for further information: <http://www.hku.hk/ortho/ortho/essw2008.htm>

SICOT/SIROT 2008 XXIV Triennial World Congress

24-28 August 2008

Normal Registration: Before 31 May 2008

This is the third in the history of SICOT that the Triennial World Congress is being held in Asia. An exciting program is arranged with topics covering basic science in bone healing and stem cell research to the latest development in computer assisted surgery and minimally invasive surgery. There is an extremely enthusiastic demand from friendly subspecialty societies for co-sponsoring programs with SICOT this year. Instead of a conventional specialty day when participants may have difficulty choosing between concurrent sessions that they are interested in, there will be activities of most of the subspecialties everyday with minimal clashing.

Please visit <http://www.sicot.org> for the program and registration



Lectures & Meetings

Date	Event	Venue
14 Feb 2008 17:30-18:30	Guest Lecture Non-specific Neck Pain: Its Symptomatology and Local Anaesthetic Block -Prof. Shoichi Kokubun	5/F Lecture Theatre Professorial Block Queen Mary Hospital
17-20 Feb 2008	AO Hand Course	HK Academy of Medicine Building
18 Feb 2008 18:15-19:15	The 6th Dr. S.K. Tam Visiting Professor Lecture - "Reconstruction of Paralysis using Implanted Neuroprosthetics" - Dr. Michael Keith	5/F Lecture Theatre Professorial Block Queen Mary Hospital
17 Apr 2008	Surgical Demonstration i) Periacetabular Osteotomy ii) Subcapital Realignment - Prof. R. Ganz	The Duchess of Kent Children's Hospital
17 Apr 2008	Surgical Demonstration Hip Arthroscopy - Dr. T. Byrd	Queen Mary Hospital
19-20 Apr 2008	5th Hong Kong International Orthopaedic Forum "The New Frontiers"	Faculty of Medicine Building The University of Hong Kong
21-24 Apr 2008	Endoscopic Foraminal Spine Surgery Workshop	Faculty of Medicine Building The University of Hong Kong
8-11 July 2008	The 15 th International Meeting on Advanced Spine Techniques http://www.imastonline.com	The Hong Kong Convention and Exhibition Centre
24-28 Aug 2008	SICOT Meeting http://www.sicot.org	The Hong Kong Convention and Exhibition Centre

Christmas Party 2007



DEPARTMENT OF ORTHOPAEDICS & TRAUMATOLOGY

CONGRATULATIONS

Professor Chow Shew-Ping, currently Chair of Orthopaedics and Traumatology, has been appointed Pro-Vice-Chancellor of The University of Hong Kong

Dr. Chow Wang & Dr. Ng Tze Pui have been promoted to consultants in Nov 2007 and Jan 2008 respectively

Dr. Chester Lie's paper "Can age related intervertebral disc changes be differentiated from degenerative disc disease?" has won the **AO best spine scientific paper** in the 27th Annual Congress of HKOA

HELLO

Dr. ZY Li has recently joined the department as Post-doctoral Fellow

Dr. K.Y. Cho, L. Chow, & Dr. M. Leung, basic surgical trainees from Department of Surgery of QMH for their orthopaedic rotation

Three little **piglets** have joined the department in the Year of Pig - sons of **Dr. Kevin Wong, Dr. Michael To** and **Dr. Christian Fang**

EDITORIAL BOARD

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Dr. Michael To

Dr. Evelyn Kuong

Dr. KH Leung

<http://www.hku.hk/ortho/ortho>