

Khai Lam

Professional history and obituary

I had only known Khai for the last 4 years when we worked together both at London Bridge Hospital and The Portland Woman and Children's Hospital. It was an honour to be asked to review his Professional career. One of the reasons that I am so enamoured with spinal surgery and so humbled simultaneously is learning that there are always many different ways to treat the same problem. Whilst sometimes this can cause confusion amongst physicians it is ultimately great for patient choice and it allows for pioneers to explore novel techniques that usually benefit the whole team, not just the patient. Khai was exemplary and pushing boundaries and forward thinking whilst utilising not just peer reviewed evidence but collecting his own.

He graduated from Nottingham Medical School in 1990. This was opened in 1970 as part of the Queen's Medical Centre and was the first to be established in the UK in the 20th century. It is famous for the development of magnetic resonance imaging by Sir Peter Mansfield (Nobel Prize 2003).

Khai quickly achieved his FRCS in general surgery and then went on to obtain his FRCS (Tr & Orth) in 2001. He worked for Prof Robert Mullholland as a spinal research fellow and as a lecturer. It is important to understand the pedigree and development of spinal surgery in the UK of Khai's mentors.

Professor Mullholland is one of the first orthopaedic surgeons who recognised and promoted the development of spinal surgery as an emerging specialty field and founded The Harlow Wood Spinal Research Unit in 1974 which would become the Spinal Research and Surgical Unit at the QMC. All Orthopaedic surgeons in the UK in the early seventies would do trauma, cold orthopaedics (joint replacement but no polio and very little tuberculosis) and posterior spinal surgery – laminectomies and instrumented fusions. A new consultant after 6 months training should feel competent to treat a disc protrusion. Spinal surgery was a very small field in these days. In 1974 Robert Mullholland had set up the Spinal Research Unit at Harlow Wood Orthopaedic Hospital funded in part by the Coal Board. Spinal surgery then was the surgery of the disc and the management of back pain and mainly non-surgical. Of his 16 fellow, 14 became Orthopaedic Consultants with an interest in Spine.

In the 1970's Orthopaedics underwent a massive change with the development of internal fixation of fractures. Furthermore, it was now appreciated that the spine could be operated upon anteriorly. Oswestry recognised this and invited Jack O'Brien to become director. He had in turn trained under Arthur Hodgson in Hong Kong who had pioneered the anterior approach to the spine in treating tuberculosis. Steve Eisenstein succeeded Jack O'Brien at Oswestry and was also a fully trained spinal surgeon and had been his fellow in 1976. He was subsequently joined by David Jaffrey, also a fully trained spinal surgeon and also a fellow of the Duchess of Kent Children's Hospital in Hong Kong. With the expansion of spinal surgery and growing interest came one of the fresh UK fellows, John Webb (whom Peter Jackson had interested in spine surgery when we was at Harlow Wood as a registrar, went to Oswestry and the US and so returned to Harlow Wood as a well trained and experienced spinal surgeon in the early 1980's).

In the mid-1980's Harlow Wood was closed and Nottingham was given their own Spinal Unit with John Webb as the Director. It now became known as The Centre for Spinal Studies and Surgery and exclusively trained spinal surgeons, the era of the orthopaedic surgeon with an interest in spine was in the past. By the early 1990's the British Orthopaedic Association was funding two fellowships, one at Nottingham and one at Leeds where Professor Robert Dickson had developed a spinal unit to train spinal surgeons exclusively. Bob Dickson faced a difficult decision in 1981 – he was offered the Chair in the famous Spinal Surgery Unit in Hong Kong and simultaneously the Foundation Chair of Orthopaedic Surgery in Leeds. He accepted the challenge of setting up an academic department in

Leeds and rapidly established a spinal research programme. He famously developed the “Leeds Procedure” a two stage scoliosis correction procedure in order to help limit fusion levels in the lumbar spine for stiff double major curves. A well known tome to spinal surgeons was a book co-authored with Dr. Ken Leatherman where he was his fellow from Louisville Kentucky

In the 1990’s major changes in the organisation of specialties occurred. The Calman report of 1995 established a unified appointment of the “numbered registrar”; restricting the number of registrars in training. Secondly, an exit examination was developed (FRCS (Tr & Orth)). After 4 years of training there was another 2 years of sub specialist training. Thirdly, at the end of training there was a Certificate of Completion of Surgical Training (CCST). In 1999 possession of this certificate was required to obtain a Consultant post. Specialty Advisory Committees (SAC) for each surgical specialty were created for conducting clinical governance of trainees and centres. At this stage it was still envisaged that whilst consultants might be appointed with an interest in spinal surgery, they would not practice it exclusively. However Orthopaedics as a specialty started to fragment into numerous sub specialties and rapid advances in spine surgery made it increasingly clear that longer specific training would be essential in spinal surgery.

External events and European politics required conformation and CCST became CCT – Certificate of Completion of Training and the Calman re-organisation was enshrined in legislation. The aspiring Orthopaedic surgeon who wished to become a spinal surgeon might find they only rotated through spinal training for 6 months during all of training. An aspiring spinal surgeon had to gain much more experience to practice spinal surgery as a sub specialty on level with other sub specialists. Furthermore, funding for training posts was handed to the Post Graduate Deans. They were not empowered to fund post certification training, so individual units had to attract funding for Spinal Fellowships on the basis of service need. It was in the hands of individual leaders in the field of spinal surgery to establish these training posts.

In 2013, the national commissioning of specialised services was made a core responsibility of the NHS Commissioning Board. Complex Spinal Surgery and spinal cord injury had been identified as a specialist service and with this new directive would be funding only for centres that could offer all specialised services. Complex spinal surgery in the UK would only be permitted to be performed in a specialist centre or as part of a provider network (hub and spoke model).

The scope of complex spinal surgery centre procedures were:

All spinal deformity surgery (adults and children)

All spinal reconstruction surgery (adult and children)

Palliative or curative spinal oncology surgery (adults and children)

Revision surgery for which primary surgery is specialist, for example, revision surgery with instrumentation for over 2 levels)

All primary thoracic and primary anterior lumbar surgery

Posterior cervical decompression surgery using instrumentation

Cervical Corpectomy

This short summary was largely taken from “A short history of spinal training and outlook on spine speciality development in the UK 1948–2013 (European Spine Journal 2013). It highlights that the people who trained Khai were part of an exclusive visionary force but who also recognised the immense challenges of both training, delivering service and uniting other specialists, such as Neurosurgeons, who had an interest in spinal surgery. The philosophies of O’Brien, Mullholland,

Webb, Dickson and Jaffrey were that the best spinal surgeons are those that can approach the spine from 360 degrees and where anterior surgery as taught by Hong Kong, were fundamental in training UK Orthopaedic Spinal Surgeons. It is of significant noteworthy comment that Khai Lam undertook the full compliment of procedures that form the scope of a complex spinal surgeon.

As a Specialist Registrar he found an early skill to win grants of £25k to study Signal Transduction in degenerative disc disease and another £25k to study Bio-molecular mechanisms in degenerative disc disease. He rotated through Nottingham and Derbyshire Royal Infirmary training in all aspects of Trauma and Orthopaedics.

Khai was the clinical spine fellow for Messrs B J Freeman, M P Grevitt, S H Mehdian and J K Webb from 2002 to 2003. Into his veins, he was injected with the philosophies of many great spinal surgeons who all wanted to forge UK spinal surgery as an independent specialty and academic force.

He worked for one year as Consultant in Nottingham under Mr John Webb, one of the forefathers of spinal surgery in the UK. He would then find himself appointed as a Consultant Orthopaedic and Spinal Surgeon at Guy's and St Thomas's Hospital.

Here he worked with Mr Jonathan Lucas, another fellow of the Queens Medical Centre at Nottingham and lead clinician of Guys and St Thomas's Hospital. Their former mentor John Webb had been instrumental in the development of AO Spine and this teaching mantle was taken up by Jonathan who was the former chairman of AO Spine UK. Khai was made the Director of Fellowships for the AO Spine (1998-2015) at his hospital and cemented Guys and St Thomas's as a coveted AO Spinal Fellowship Reference Centre.

GST dates from 1721 when it was founded by a philanthropist Thomas Guy, who had made a fortune as a printer of Bibles and greatly increased it by speculating in the South Sea Bubble. It was originally established as a hospital to treat "incurables" discharged from St. Thomas's Hospital. Guy had been a Governor and benefactor of St Thomas' and his fellow of Governors supported his intention by granting the south-side of St Thomas's street for a peppercorn rent for 999 years. Following his death in 1724, Thomas Guy was entombed at the hospital's chapel in a tomb featuring a marble sculpture by John Bacon.

He was recognised by his peers at the International Group for the Advancement of Spinal Science (IGASS) and made the director of Minimally Invasive Spine Surgery (2008-2016). He was also a member of the expert AO spine group for atraumatic minimal access spine surgery leading to the development of an anterior lumbar cage known as the SynFix Evolution.

From my own memory and experience of joint operating, Khai Lam was an exquisite anterior spinal surgeon. He had deft skills at mobilizing the great vessels with precision and paucity of movement. He taught a cutting technique rather than a more traumatic pull and push technique which can cause catastrophic problems when manipulating fragile vessels. This ability to perform open anterior surgery as well as minimally invasive anterior surgery led to being the Director of Minimal Invasive Surgery at London Bridge Hospital in 2011. He was part of the Global and European Proctor Training of XLIF (Nuvasive) since 2014, the EMEA Chairman and Regional Director of SOLAS ((Society Of Lateral Access Surgery) from 2018, a Global Proctor for the M6L Lumbar Disc Replacement (Spinal Kinetics/Orthofix) since 2018, proctor for the Railto Sarcoiliac fusion device (Medtronic) since 2018 and proctor for the AL-ALIF (Nuvasive) since 2018.

With the advent of new technology re-kindling anterior spinal surgery in a minimally invasive fashion, spinal surgery found itself looking towards equally minimally invasive posterior spinal surgery techniques. The ability to accurately restore lumbar lordosis with anterior interbody cages needed stabilization from the back with pedicle screws. Khai Lam saw that this could be done expertly with spinal navigation to safely insert the screws but an even larger step forward was the use of robotics

to not just accurately insert the screws but also accurately align the screw heads and rods in a perfect configuration. Following on from pioneering robotic spinal instrumentation he sat on the Globus Advisory Board for Excelsius Robotic Surgery and Product development since 2019.

As well as being an excellent technical surgeon, Khai Lam's opinion and was highly sought. He was the spine advisor to His Majesty, King Abdullah Royal Clinics, Saudi Ministry of Health Offices and Saudi Military. He was the Spine Advisor and Visiting Consultant to Kuwait Ministry of Health, Kuwait Military, and Kuwait Oil Company. He was the Spine Advisor and Visiting Consultant to U.A.E. Ministry of Health and Abu Dhabi Military. He was the Spine Advisor and Visiting Consultant to the Egyptian Ministry of Health and Ministry of Interior. He was the Spine Advisor and Visiting Consultant to the Qatar Ministry of Health, Qatar Military and Royal Family. He was also the Spine Advisor and Visiting Consultant to the Egyptian Ministry of Interior.

Khai Lam also has several honours. He was the first British recipient of the Gold Medal of Honour being invested to him by Madame Ann-Dao Traxel, President of Etoile Européenne du Dévouement Civil et Militaire (EEDCM) and daughter to HE the late President Chirac of France. On 29th Jun 2016, His late Majesty King Kigeli V of Rwanda invested him the Knight Grand Cross of the Royal Order of the Lion. On 9th Jan 2017, His Majesty King Yuhe VI of Rwanda invested him the Knight Grand Cross of the Royal Order of the Crested Crane.

Surgeons are often inventive. Orthopaedic surgeons are like carpenters. They love their tools and Khai Lam was no different. He collaborated and helped develop a long list of products which gave him great joy. These included working with Depuy Synthes on the Constellation Minimal Invasive Pedicle Screw System, Universal Reductions Screws (URS), Universal Reduction Screws Plus (URS+), Minimal Invasive USSII Fracture system, Matrix MIS (Minimal Invasive Spine) Pedicle Screw System, T-Pal cage (for interbody fusion), SynCage Evolution and SynFix Evolution Interbody Cage, Insight MIS Tubular Retractor Spine System and the Insight Tubular Retractor Spine System. He worked with Nuvasive as a product advisor for BASE ALIF cage and their Anterior Access Frame. He collaborated with Medtronic as product advisor and educator for Rialto and the O arm 2. His most recent collaboration was advisor and educator of the Excelsius GPS robot and was the first person in the UK to operate with this device.

When researching the people that Khai has directly taught it warmed my heart to see quite how many people he directly educated. These qualities to teach are what drives many of us doctors. It is of the utmost importance because the next generation must always learn. There were 34 Clinical Fellows from 2004 to 2021 and there were 85 Clinical Observers from 2008 to 2019. He published 65 peer reviewed articles, a further 10 non peer reviewed articles and 3 book chapters. From the authorships in these papers, he clearly collaborated with our global community of spinal surgeons. I know first hand how much he loved research. He knew that it was a key leg in the stool that any good clinician worth their salt must have. He understood the need to keep good records and data and prospectively study where possible and retrospectively where not. We live and work in a community where peer review is essential and he was not shy to ensure that his data, good or bad was transparent and available. This was evident in the greater than 120 podium presentations and 190 invited lectures right up to the COVID era. Over his career he raised over a million pounds in research grants to help forward the study of spinal surgery.

In research for this task at hand I came across a letter from Professor Chen Zhongqiang of the Peking University Third Hospital recommending him for a Chinese National Honour. It recounted his achievements but also mentioned he had been "unusual as a leader in advancing medical science, in advancing medical practices and in training spinal surgeons". These qualities are echoes of the giants in spinal surgery that taught Khai and Professor Zhongqian noted no less than 19 spinal surgeons who were elevated to Distinguished Professorships in China.

I had the privilege of meeting some of Khai Lam's recent patients. The tears that were wept on hearing of his sad news showed that he touched his patient's hearts not just through his skills as a surgeon but with the kind bedside manner of a kind physician and as a shoulder to lean on as a gentleman. Our spinal surgery community has lost a pioneer and a truly noble surgeon who put academia at the forefront as taught to him by an illustrious history of mentors.