

Hand Surgery

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Abstract

A historical outline of the development of Hand Surgery in Singapore is presented. It traces its growth from the Orthopaedic Surgery Unit at General Hospital Singapore in the early 1950's, to the present times. During this period, the Singapore Society of Hand Surgery was established in 1982, the Department of Hand Surgery at the Singapore General Hospital in 1985 and the Hand and Reconstructive Microsurgery Department was officially established at the National University Hospital in 1990.

Keywords: *History, Microsurgery, Reconstructive surgery*

Introduction

"The greatest advance in the treatment of acute hand trauma is the emergence of the hand surgeons" — Kaplan.

Hand surgery is a cryptic term as it not only involves the management and treatment of traumatic injuries to the hand but includes the disorders of the whole upper extremity and any other part which contributes to the function of the hand as well as to the well being and total care of the patient. It encompasses the expertise of microsurgery, orthopaedic surgery, plastic and reconstructive surgery, neurosurgery and general surgery, thus, contributing to the finesse and innovations of the hand surgeon.

In Singapore, Hand Surgery had a humble beginning as a spin off from Orthopaedic Surgery. The Department of Orthopaedic Surgery was formed on the 1st of April 1952, at the General Hospital (GH), Singapore. The speciality of hand surgery has always been an integral part of the service. The first local orthopaedic surgeon to show an interest in this sub-specialty was Dr Yeoh Kean Hong, who on his way back to Singapore in 1961, after completing his MCh. (Ortho) degrees from the University of Liverpool, spent a short period with Paul W Brand in Vellore, India. Professor Donald R Gunn, then Chairman of Orthopaedic Surgery together with Dr Yeoh and Dr Raja Ayathurai, were closely involved in the initial growth of the speciality in Singapore. They developed the surgical restoration of hand deformities in leprosy cases with quite a large number of tendon transplants done at the Sungei Buloh Leprosarium.

With the forging of industrialisation in Singapore, the importance of the management of hand injuries became prominent. Dr Pesi B Chacha who joined the University Department of Orthopaedic Surgery in 1967, was responsible for setting-up special clinics for hand surgery cases to handle the expected influx of hand trauma.

Dr Kanwaljit Soin was the first to receive a Colombo Plan Fellowship to be trained in Hand Surgery. She worked in Australia with John T Hueston at the Plastic and Facio-Maxillary Surgery Unit, Royal Melbourne Hospital in 1972. On August 1st, 1972, the Burns Unit at the General Hospital (GH) Singapore, was separated from the University Department of Orthopaedic Surgery (C Unit) and became a part of the Plastic and Reconstructive Surgery Unit (Plastic Unit). It was headed by Dr Wong Kum Leng and on her return from Australia, Dr Soin joined this unit. Hand injuries were then managed by the Plastic Unit, the Orthopaedic C Unit headed by Professor P B Chacha and the Government Orthopaedic Surgery Unit (O Unit) headed by Drs W F Fung and N Balachandran.

In 1975, The University of Singapore, received a generous donation of S\$40,000 from Robin Loh of Robin Shipyard through the Lions Club East of Singapore to establish microvascular surgery in Singapore. This marked a new chapter in the development of Hand Surgery in Singapore. With the incorporation of microsurgery, a whole variety of surgical techniques and treatment for upper extremity trauma could be applied. With the welcome donation towards microsurgery, the first

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known operating microscope in this region was purchased — the Zeiss OPMi 6 Operating Microscope on 25 June 1975.’

Prior to this in 1974, Dr Robert WH Pho who was trained in Hand Surgery in the United Kingdom under Dr T Norton and Dr A Park in Glasgow, and Dr Stewart Harrison at the Windsor Group Hospital, England joined C Unit. Together with Dr Jimmy Daruwalla, Dr KQ Yeo, Dr CK Tay and Dr Ong Leong Boon, and under the leadership and far-sighted vision of Professor PB Chacha, they launched an energetic move to set-up a microsurgical section within C Unit at GH. In 1976, the first replantation service in this region was set-up. This provided the team with the impetus to push the frontiers of applied microsurgery in the management of hand injuries, limb salvage and reconstructive surgery to its highest level. In 1977 and 1978, Tan Sri Runme Shaw made generous donations towards the microsurgery donation fund, which allowed the purchase of a second operating microscope. Together with research funds from the University of Singapore, it was possible to establish a fully operational microsurgical unit, working closely with O Unit, particularly with Dr Tan Ser Kiat who had a shown a keen interest in the field, and Dr Lee Seng Teik of the Plastic Unit.

SINGAPORE SOCIETY OF HAND SURGERY

In early 1982, a group of dedicated surgeons got together, and through discussions and correspondence with various overseas Hand Societies and International Hand Federations, realised the potential of establishing a national body in Hand Surgery. At the inaugural meeting on the 30 April 1982, a *protem* committee got together and agreed upon a constitution for the society. On 30 December 1982, the Singapore Society of Hand Surgery was officially registered. This significantly boosted the development and pursuit of Hand Surgery in Singapore. The founding committee comprised of Associate Professor Robert WH Pho as President, Mr Lee Seng Teik as Vice President, Mr Tan Ser Kiat as Honorary Secretary, and Mr CK Tay as Honorary Treasurer. The society made up of mainly orthopaedic surgeons and plastic surgeons, was able to establish a common focus and exchange ideas and experiences with a view to training, research as well as projecting Singapore on the International scene. In 1989, the Society under the leadership of Dr K Soin, organised its first International Scientific Combined Meeting with the Australasian Hand Club. The distinguished guest at the meeting was Professor Venkataswami from Madras, India. The Second Scientific meeting incorporated the Wrist Arthroscopy Workshop conducted by Dr Alan Hayes from Adelaide, Australia. The society has since been affiliated to the International Federation of Society for the Surgery of the Hand.

DEPARTMENT OF HAND SURGERY, SGH

On the first of January 1985, the Hand Surgery Unit was officially established at the Singapore General Hospital (SGH). The objectives were: a) To provide a consultative and clinical service for all surgical conditions related to the upper extremities, b) To train medical and nursing staff in the management of surgical conditions related to the hand, c) To coordinate and educate the public in the prevention of hand injuries at a national level, d) To provide a service for microvascular free tissue transfer and reimplantation of limbs at the Singapore General Hospital, and e) To incorporate the teaching of hand surgery and microvascular reconstructive techniques, both clinical and experimentally, into the training of orthopaedic and plastic surgeons.

The unit began with a small complement of staff, with Professor Robert WH Pho as Head and Senior Consultant, Mr Tan Ser Kiat as Consultant, and Mr Tan Kok Chai as Registrar. The nursing staff was headed by Nursing Officer Tay Kim Neo with a team of six nurses. The Hand Therapy team comprised of Ms Angeline Tang and Mrs Josephine Yip. In September 1985, Mr Julian Wee joined as a full-time Senior Registrar, and Dr K Soin joined the Unit in March 1986 as a Visiting Specialist. Registrars from both O Unit, C Unit and the Plastic Unit were rotated to the Hand Surgery Unit for training.

Since its inception, the unit dealt with patients embracing the whole spectrum of Hand Surgery including congenital malformations, brachial plexus injuries, paralysed upper limbs, degenerative diseases, tumours and traumatic injuries related to the hand. The unit also introduced sub-speciality clinics, in particular the congenital clinic and wrist clinic thus streamlining the units activities. 1988 marked a period of consolidation and achievement for the unit. Mr Teoh Lam Chuan completed a one year Hand Surgery Fellowship at the Louisville Institute for Hand and Microsurgery, Kentucky and on his return he was appointed as Consultant to the unit adding new blood and talent to the team of dedicated hand surgeons. To further boost the quality of the service the supporting paramedical staff were also sent on fellowships. In 1987, Nursing Officer Tay Kim Neo spent a six month fellowship in Hand Surgery Nursing at the Louisville Institute for Hand and Microsurgery and Raymond Curtis Hand Rehabilitation Centre, Baltimore. Hand Therapist Ms Josephine Yip, spent six months at various centres in the United States in 1988 and Staff Nurse Low Siew Hong another six months in Hand Rehabilitation Centre of Indiana, Indianapolis in 1989.

The unit was closely associated with C Unit, O Unit and the Plastic Unit with staff sharing the emergency cover with the Hand Unit and with Mr Prem Kumar and Mr Kour Anam Kueh as seconded staff to the Hand Sur-

gery Unit from the C Unit, the consolidation and development of the specialty took shape.

In 1989, Mr Teoh Lam Chuan took over as Head of the Unit with the return of University staff to the National University Hospital. Through its achievements, the unit was upgraded to a fully fledged department within the Singapore General Hospital with a full-time head and junior staff.

VISITING EXPERTS IN HAND SURGERY

The Academy of Medicine was also instrumental in orchestrating the development of Hand Surgery in Singapore. They sponsored several projects and workshops which helped cultivate the interest of Hand Surgery. In 1981, the first Hand Surgery Course was organised under the Chairmanship of Professor Robert Pho through the Chapter of Surgeons, Academy of Medicine (AM). That same year, the International Workshop of Microsurgery was held. A second Advanced Hand Surgery Course followed in 1982 jointly organised by AM and the Singapore Society of Hand Surgery at the 18th Singapore-Malaysia Congress of Medicine. The invited speakers to this course were quite impressive. They brought together Allan L van Beek, Bernard McC O'Brien, Chehab Rukni Hilmy, Harold Klienert, R Venkatasawami and Tatsuya Tajima. In 1983, for the first time at the 17th Annual Combined Surgical Meeting organised by the AM and the Singapore Surgical Society, a special section was introduced to invite free papers on Hand Surgery and Microsurgery. Nine papers were presented. In 1986, two major meetings in conjunction with the 20th Annual Combined Surgical Meeting were organised which also laid the foundations for Hand Surgery. One was the 1st Flap Dissection Workshop and the other was the Post-Congress Meeting of the 3rd Congress of the International Federation of the Society for Surgery of the Hand.^{2,3}

The specialty of Hand Surgery in Singapore was further nurtured by the establishment of the HMDP Visiting Experts in the Hand Surgery Programme. This programme has brought to our shores several distinguished hand surgeons from all over the world to impart their experience and knowledge. In 1984, Harold Klienert was the first HMDP Visiting Expert in Hand Surgery. In 1985, it was Alfred B Swanson. In 1986, Andrew J Weiland from John Hopkins University, Maryland, USA and in 1987, Graham Lister from Louisville, Kentucky, USA. Other visiting hand surgeons who passed through Singapore and delivered inspiring lectures in hand surgery were Ronald L Linscheid and Bernard F Morrey from Mayo Clinic, Yoshikazu Ikuta from Hiroshima University, Kengo Nakano of Hyogo Medical College, Alain Gilbert from France, G Brunelli from Italy, G Loda from Argentina, A Narakas from Swit-

zerland, Olles from Spain, and many more — each a recognised expert in the field.

DEPARTMENT OF HAND AND RECONSTRUCTIVE MICROSURGERY, NUH

With the return of all university staff from the Singapore General Hospital, Professor Robert Pho and his team set out to establish a Hand division within the National University Hospital (NUH) to complement the hand service at SGH. With his experience in Hand Surgery, Microsurgery and Reconstructive Surgery coupled with the support from Chief Executive Officer, Dr Judy Lim and the Board of Directors of NUH, a new department was officially established at NUH on 1st December 1990 as the Department of Hand and Reconstructive Microsurgery. A complement of staff was seconded from the Department of Orthopaedic Surgery, NUS. The team comprised of Professor Robert Pho as Chief, Mr K Satkunathan and Mr V P Kumar as Consultants, and Mr A K Kour as Senior Lecturer/Senior Registrar.

SIGNIFICANT ACHIEVEMENTS IN HAND SURGERY

Since the introduction of the microsurgical section by Professor P B Chacha and Professor R W H Pho, some of the significant achievements for Hand Surgery and for medical history in Singapore should be mentioned. The first upper limb replantation was achieved by Leong Hin Seng⁴ and his team at the Alexandra Hospital on 12 April 1975. The first successful replantation of the completed amputated thumb was done by Robert Pho, C K Tay and K Q Yeo on 21 January 1977.⁵ The first toe to hand transfer was done on 17 October 1980 by Robert Pho, Tong G On, JS Daruwalla, Tay Boon Keng and C K Tay.⁶ The first free vascularised fibula graft transfer to the radius was done on 22 June 1978 by R W H Pho, P B Chacha and Yeo K Q.⁷ This was also the first documented case in the English literature in using this technique and has since been incorporated in the Textbook of Operative Surgery and American Academy of Orthopaedic Surgery Teaching Course.

LITERATURE REVIEW

Singapore's contribution towards research and development in Hand Surgery has not been trivial. The more significant are in free tissue transfers and flaps,^{8,14} replantation and reconstruction of the upper limb,^{4,15-23} tendon transfer^{24,25} and free vascularised fibular graft transfer of the upper limb.^{7,23,26-32} Other impressive contributions also include works in general orthopaedics,³³⁻⁴¹ carpal tunnel syndrome,⁴²⁻⁴⁴ nerve and vessel transfer,⁴⁵⁻⁴⁸ management of burns in the upper limb,^{49,50} experimental surgery in the laboratory^{24,51-63} and new innovations.^{64,65} A book titled Microsurgical

Techniques in Orthopaedics outlines some of these works.⁶⁶

Concluding Remarks

“The ability to achieve precision and exactness in the microsuture of small vessels has epitomised one of the greatest landmarks in the advancements of surgery”.

The contributions of microsurgical techniques and the importance of limb salvage and reconstructive surgery has provided the basis for future developments in hand surgery. Today, our philosophies are parallel to that of the developed countries like the United States, UK, Europe and Japan. With the rapid advancements, the way Singapore is pioneering in Biomedical Science and Technology and the twin efforts of the Hand Surgery Unit at SGH and the newly formed Department of Hand and Reconstructive Microsurgery at NUH, Singapore will be internationally recognised as one of the leading referral centres in hand surgery.

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