

# BSSH EDUCATION AND TRAVEL BURSARY 2025

## NERVE RECONSTRUCTION FELLOWSHIP

### Taipei Municipal WanFang Hospital (Taiwan)

*Supervisor: Professor David Chwei-Chin Chuang*

*1st August 2025 – 1st August 2026*

**Mr. Jing Qin Tay**

Specialty Trainee Registrar, Thames Valley & Wessex Deanery



## **INTRODUCTION**

I would like to express my sincerest gratitude to the BSSH Education and Travel Committee for supporting my twelve-month out-of-programme-training fellowship in peripheral nerve reconstruction at Taipei Municipal WanFang Hospital, Taiwan, and to Professor David Chwei-Chin Chuang for accepting me into his unit and teaching me with such generosity throughout the year. Professor Chuang is among the most experienced brachial plexus surgeons in the world, with a personal series exceeding 2,200 adult brachial plexus reconstructions, 600 paediatric brachial plexus cases and over 1,000 functioning free muscle transplantation (FFMT). He is well-known for his unique approach to treating motor aberrant reinnervation sequelae (MARS) in brachial plexus birth injury (BPBI) patients. To spend a year in a single-surgeon practice of that depth is an opportunity that simply does not exist within a UK training programme.

The primary aim of the fellowship was to obtain subspecialist exposure to the management of adult and paediatric brachial plexus injury and complex peripheral nerve reconstruction of the upper limb. Secondary aims were to develop competence in nerve transfer and functioning free muscle transplantation, to understand how a high-volume unit assesses and reports its own outcomes over decades of follow-up, to contribute to the unit's academic output, and to gain an appreciation of a healthcare system that manages high patient volumes with remarkable efficiency.

## **THE UNIT AND ITS SURGEON**

Professor Chuang established and led the Brachial Plexus and Peripheral Nerve Service at Chang Gung Memorial Hospital, Linkou, over a career spanning more than four decades, and now runs his practice at Taipei Municipal WanFang Hospital while retaining his academic and teaching links with Chang Gung. My fellowship was therefore split between the two institutions: operating and clinic at WanFang, and multidisciplinary meetings and teaching at Chang Gung. Chang Gung Memorial Hospital is one of the largest hospital systems in the world, and its Microsurgery Training Centre has trained several thousand microsurgeons from every continent since its establishment.

What distinguishes the unit is not only volume but continuity. Patients referred from across Taiwan and around the world are followed by the same surgeon for ten, twenty and in some cases thirty years. Pre-operative and post-operative video, standardised muscle grading and long-term functional scoring are recorded on every patient. The result is a prospectively

documented series of a size and duration that no individual unit in the United Kingdom could realistically assemble, and it underpins much of the published evidence base that we rely upon when counselling brachial plexus patients at home.

The weekly Peripheral Nerve Team (PNT) meeting is the intellectual centre of the unit. Book chapters or latest papers are read and discussed. Cases are presented with clinical video, electrophysiology test results and imaging. The cases are discussed jointly with the neuroradiologist, rehabilitation medicine physicians and hand therapist. Professor Chuang actively encouraged vigorous discussions from different members of the team, irrespective of the levels of training or specialties. Trainees are expected to commit to a plan and then defend it, and the discussion continues until the reasoning, rather than the answer, is understood.

## **FELLOWSHIP EXPERIENCE**

My week was structured around operating lists, a dedicated brachial plexus clinic, the PNT and radiology meetings, and time in the microsurgery training center. Over the year I assisted in and progressively participated in the full range of the unit's reconstructive practice.

Adult brachial plexus reconstruction formed the core of the fellowship. Cases included supraclavicular and infraclavicular exploration with intra-operative nerve stimulation, neurolysis, sural nerve grafting, and the full repertoire of nerve transfers: spinal accessory to suprascapular nerve, intercostal nerve transfer to the musculocutaneous nerve, the Oberlin transfer, phrenic nerve transfer, and contralateral C7 transfer for total root avulsion. I was able to participate in decision making regarding reconstruction priority when donor nerves are scarce, especially when there is multiple roots avulsion or rupture.

Functioning free muscle transplantation is performed in this unit at a volume seen almost nowhere else. I participated in single and double gracilis transfers for elbow flexion and finger movement, and in the technically demanding "one muscle, two functions" transfer, in which a single gracilis is split and inset to restore both elbow flexion and finger extension. This was one of the three most memorable cases of my year. The other two were an unusual case of thoracic outlet syndrome decompression with abnormal bony spurs on first rib, and a bilateral, multiple root avulsion in a young lady in whom every reconstructive decision carried a lifetime of consequence.

I became particularly interested in the sequelae of aberrant motor reinnervation, the co-contraction and synkinesis that follow spontaneous or surgical recovery, and this became the subject of two of my published articles during the year. In the hand and upper limb more broadly, I was exposed to tendon transfer for radial, median and ulnar nerve palsy, intrinsic reconstruction

and strategies for sensory restoration in the insensate hand. I also assisted in facial reanimation surgery — free gracilis transfer for facial palsy and selective myectomy for postparalytic facial synkinesis — which, although outside the hand, uses precisely the same principles of donor selection, tension setting and objective outcome measurement.

Time in the Microsurgery Training Centre was protected rather than incidental. Professor Chuang expects fellows to practise, and his teaching there was as much about preparation as about technique: "Spend time to prepare the nerves and vessels well, and the environment in which they rely upon to heal."

Two further lessons from the year were not technical at all. The first came from clinic: "Honesty is the best policy — get the patient's family involved early." Brachial plexus reconstruction promises years of rehabilitation for an incomplete result, and the consent conversation in this unit is unusually frank about what will not be recovered. The second was Professor Chuang's aphorism in theatre that treating a nerve is like treating someone you love — handled gently, given time, and never rushed. It is a memorable way of teaching atraumatic technique, and it has stayed with me.

## **COMPARISON WITH UK PRACTICE AND SET-UP**

The most obvious difference is volume and centralisation. Adult brachial plexus reconstruction in the United Kingdom is concentrated in a small number of units, and a plastic surgery trainee may reasonably complete higher surgical training having assisted in only a handful of explorations. In Taiwan, referral of these injuries to a single recognised surgeon is the cultural and professional norm, and the consequence is that decision-making is informed by a personal series rather than by the literature alone.

Timing of referral differs markedly. Patients in the Taiwanese system reach the unit quickly, sometimes within weeks of injury, which preserves the window for primary nerve reconstruction. Delayed presentation remains a real problem for our own service, and much of the reconstructive compromise we accept at home is a direct consequence of time lost before referral rather than of the injury itself. If there is one system lesson I would bring back, it is the value of a clearly signposted national referral pathway with an explicit expectation of early contact.

The Taiwanese equivalent of the National Health Insurance system produces an outpatient model that is unrecognisable from a UK clinic. Access is rapid, waiting lists for elective surgery are short, and patient throughput in clinic is very high. Consultations are brief but efficient, supported by a high degree of family involvement — relatives routinely attend, ask

questions and take responsibility for the rehabilitation programme. Given that the outcome of any nerve reconstruction depends on eighteen months to three years of committed physiotherapy, this family engagement is not a cultural curiosity but a genuine clinical asset.

Finally, the unit's approach to outcome assessment is more disciplined than anything I have worked within at home. Every patient is graded objectively, every result is filmed, and complications and failures are discussed openly at the PNT meeting. In a field where the reported results are often flattering, the willingness to document and present the cases that did not work is, I think, the single most transferable practice of the year.

## **ACADEMIC AND RESEARCH OUTPUT**

Writing consolidated my learning. Over the twelve months I submitted five manuscripts, of which three have been published or accepted, in the Journal of Plastic, Reconstructive & Aesthetic Surgery (JPRAS) and Plastic and Reconstructive Surgery (PRS) – Global Open, together with an invited book chapter. The principal theme of this work was the classification of motor aberrant reinnervation sequelae, applied both to brachial plexus birth injury and to postparalytic facial synkinesis, drawing on Professor Chuang's long-term series. Further work on prophylactic dermal fat grafting following myectomy is currently under review.

I presented aspects of this work at Plastic Surgery The Meeting 2025 in New Orleans and at the Global Plastic Surgery Congress 2026 in Buenos Aires, and I sat the EBOPRAS, European Board of Hand Surgery and FRCS (Plast) examinations during the same period. Preparing for board examinations while operating in an unfamiliar system was demanding, but the clinical exposure and the revision reinforced each other more than I had expected.

## **APPLICABILITY TO UK AND GLOBAL PRACTICE**

I return to the United Kingdom with a set of skills that are directly applicable to our hand and upper limb practice: nerve transfer for isolated peripheral nerve palsy, the assessment and staged management of brachial plexus birth injury, functioning free muscle transplantation, and a far clearer framework for deciding when reconstruction is worthwhile and when it is not. Equally important is the habit of objective, filmed, long-term outcome assessment, which requires no additional funding and which I intend to build into my own practice from the outset.

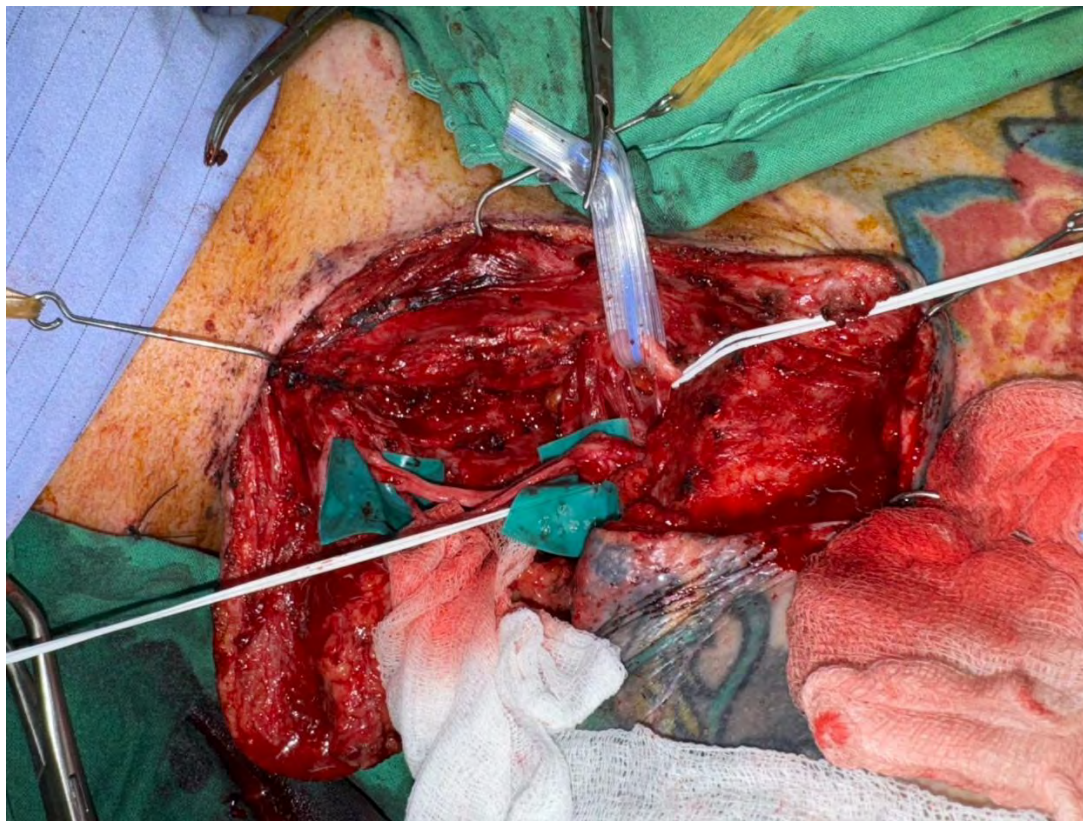
As Chair of the ASPS International Residents Forum, I have spent the year working on structured international exchange for surgical trainees, and this fellowship has clarified why that matters. Much of what I learned could not have been acquired from reading; it required a year of standing at the same table as a surgeon who has performed the operation two thousand times. I

am also conscious that the low-cost microsurgical training models used in Taiwan, and the simulation work I have previously developed in the UK, transfer readily to resource-limited settings, and I hope to contribute to training in that context as my career develops.

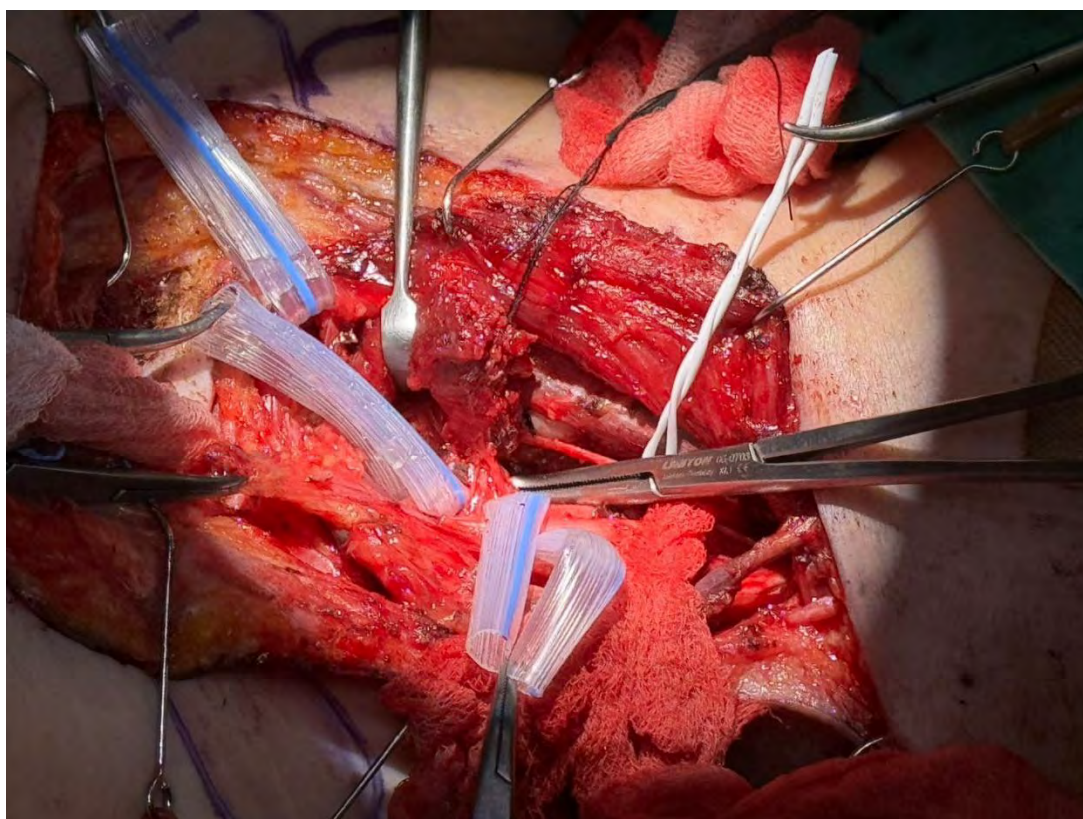
## **FINAL THOUGHTS AND CONCLUSION**

There is a Taiwanese expression, 人情味 (rén qíng wèi), which describes the warmth of human feeling — the quiet generosity that runs through daily life there. It ran through the fellowship as well. Professor Chuang taught me nerve surgery, but he also took an interest in my life outside the operating room in a way that I did not anticipate and will not forget, and the colleagues who became friends over late dinners and long cases made a foreign city feel like home within a few months.

I arrived in Taipei to learn an operation and I am leaving with a way of thinking: sharper hands, a better sense of when to operate and when to wait, and a clearer understanding that this surgery is about people rather than procedures. It has been a privilege to learn from Professor Chuang and his team, and I am sincerely grateful to the BSSH Education and Travel Committee for the support that made this year possible. I would recommend this fellowship without reservation to any UK trainee with a serious interest in peripheral nerve and brachial plexus surgery.



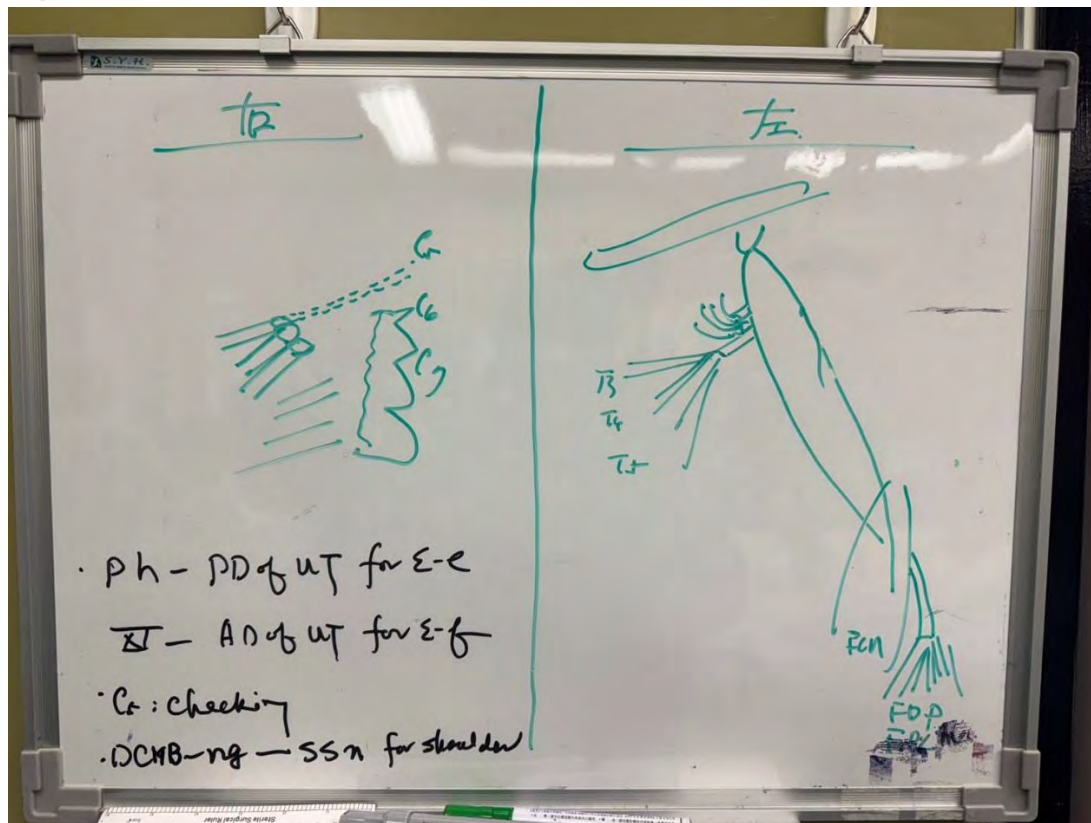
**Figure 1.** Intra-operative photograph – Right supraclavicular brachial plexus exploration with spinal accessory nerve to suprascapular nerve transfer



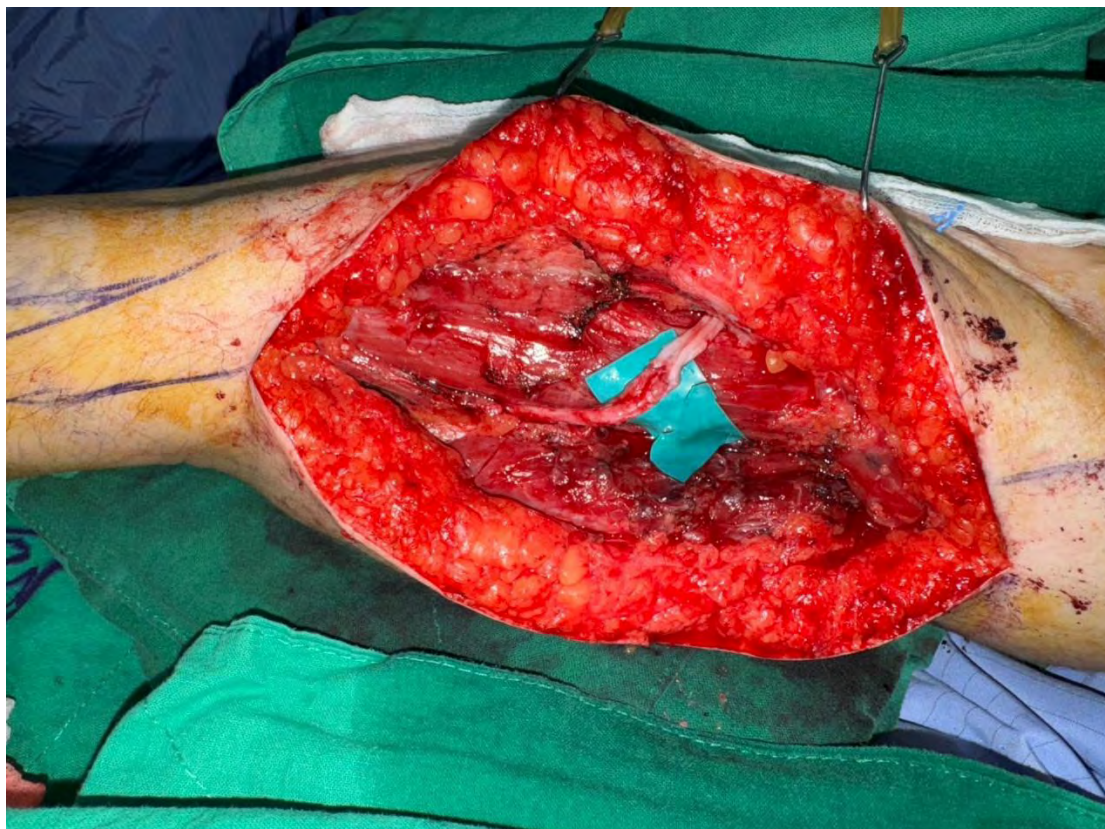


**Figure 2.** Intra-operative photograph — Excision of left anterior scalene muscle and first rib as part of the thoracic outlet decompression surgery.





**Figure 3.** Three-team approach for bilateral exploration of brachial plexus (multiple roots avulsion/rupture), nerve transfer and cable grafting, and concomitant harvest of gracilis muscle for functioning free muscle transplantation.



**Figure 4.** Intra-operative photograph – Cable grafting of radial nerve at the level of mid humerus after excision of neuroma secondary to iatrogenic injury.



**Figure 5.** The chief resident, myself, Professor David Chwei-Chin Chuang and a third-year resident at Taipei Municipal WanFang Hospital.

*Accident (driver)  
knife 70cm/wh,  
2 hrs, LOC (-) 11/11-12-14  
No hb for*

## Left Brachial Plexus

Name: [REDACTED] Chart #: [REDACTED] Birth date: [REDACTED] Date exam: [REDACTED]

Address: [REDACTED]

Present illness: [REDACTED] Date of injury: [REDACTED]

Past history: [REDACTED]

Date operation: [REDACTED] X-Ray and MRI: [REDACTED]

EMG: [REDACTED] Horner's syndrome: [REDACTED]

Vascular lesion: [REDACTED]

Mobility of diaphragm: [REDACTED]

| C5                |  | C6 |  | C7 |  | C8 |  | T1 |  |
|-------------------|--|----|--|----|--|----|--|----|--|
| TRAPEZ            |  |    |  |    |  |    |  |    |  |
| Rhomb             |  |    |  |    |  |    |  |    |  |
| Levator scap      |  |    |  |    |  |    |  |    |  |
| SERRATUS ANT      |  |    |  |    |  |    |  |    |  |
| BICEPS            |  |    |  |    |  |    |  |    |  |
| PRON              |  |    |  |    |  |    |  |    |  |
| FCR               |  |    |  |    |  |    |  |    |  |
| PL                |  |    |  |    |  |    |  |    |  |
| TRICEPS           |  |    |  |    |  |    |  |    |  |
| ECR               |  |    |  |    |  |    |  |    |  |
| ECU               |  |    |  |    |  |    |  |    |  |
| BRACHIO-RADIALIS  |  |    |  |    |  |    |  |    |  |
| EXT DIG           |  |    |  |    |  |    |  |    |  |
| APL EPB           |  |    |  |    |  |    |  |    |  |
| PROPR             |  |    |  |    |  |    |  |    |  |
| EPL               |  |    |  |    |  |    |  |    |  |
| SUPINATOR         |  |    |  |    |  |    |  |    |  |
| FCU               |  |    |  |    |  |    |  |    |  |
| LATISSIMUS DORSI  |  |    |  |    |  |    |  |    |  |
| PECTORALIS MAJOR  |  |    |  |    |  |    |  |    |  |
| CAVICULAR STERNAL |  |    |  |    |  |    |  |    |  |

*3* *2* *3* *3*

*Tinel*

*3*

M0 M1 M2 M3 M4 M5

S0 S1 S2 S2+ S3 S3+

**Figure 6.** Special chart for documentation of clinical findings both pre- and post-operatively.

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