**THE BRITISH ORTHOPAEDIC ASSOCIATION ZIMMER TRAVELLING FELLOWSHIP AWARD**

FELLOWSHIP REPORT

Mr. Robert J. MacFarlane MBChB MRes PhD FRCS

Introduction:

Upon learning that I had been awarded a BOA travelling fellowship I was extremely proud to have been selected. I knew it was a competitive process and that if I was to be able to gain the funding to go ahead with my plans to undertake a travelling fellowship to visit the units that I had long planned to visit, upon the completion of my training in trauma and orthopaedics, I would need to complete a good application with a clear view of what I planned to do. In addition, it was clear I would need to be focussed and come through an interview process that would ask some searching questions about my career, my plans, and what I wanted to get out of a travelling fellowship. I was aware that the itinerary I had put together was quite ambitious and potentially quite expensive, but also that if I was unable to secure part-funding for my travels, I would be willing to self-fund, as it meant a lot to me. I was therefore delighted to be awarded the Zimmer Upper Limb travelling fellowship by the BOA fellowships committee.

The three units that I planned to visit were far apart. The first of these was the Institut de la Main, Paris, France, followed by The Beth Deaconness Medical Center at the Harvard School of Medicine, Boston, USA; and finally to Ganga Hospital in Coimbatore, India. I had for a long time wanted to visit these places, not least because they are centres of excellence in their own right and the surgeons I planned to visit and learn from had experience and expertise in the hand and upper limb pathologies and techniques that interest me, but also they are in interesting countries with different healthcare systems, with significant differences from the my own country and the NHS.

Throughout my training within the Mersey deanery I had built a clear picture of how I wanted broaden my experience after finishing my higher surgical training. I had already arranged two fellowships in hand surgery at units in London, and I was aware that I would have 2-3 months of potentially free time after gaining CCT and commencing my UK fellowships. It was clear to me that I should use this time wisely, realise my long-held plan to visit these units, and broaden my surgical and professional experience, whilst taking the opportunity to travel and also reflect on what had been a long and difficult process of completing my surgical training and my research in the preceeding years.

I had provisionally set an itinerary to visit the three units to commence soon after my CCT, in June 2019, completing in September 2019 prior to the commencement of my hand and wrist fellowship in London at the start of October. The interviews were held in May 2019 and therefore I had made many of the arrangements prior to knowing whether I would have a contribution to the funding of the trip. It was therefore great news to learn before I departed on the planned trip that I had been awarded the Zimmer BOA travelling fellowship which would go a long way to helping to fund the trip.

**Visit 1:** L’institut de la Main, Clinique Bizet, Paris, France.

Dates: 22.06.2019 - 03.08.2019

Under the supervision of Dr. Caroline LeClercq, I spent 6 weeks at L’Institut de la Main in Paris. I was very fortunate to be able to rent an apartment in the 7me arrondisement which was walking distance from the institute. The weather in Paris during June and July 2019 happened to be fantastic, if a little uncomfortable at times, with temperatures in the mid-thirties almost daily, and during that period some of the highest ever recorded temperatures in Paris were seen. The memory of my blazing stay in France’s capital, and learning from one of most intelligent and technically gifted surgeons I have seen, remains strong and always will.

Dr. Leclercq’s practice is predominantly adult hand and wrist surgery, with a further subspecialist interest in the spastic upper limb. During my orthopaedic training in the UK I had not seen any upper extremity surgery for the management of spasticity, in adults or children. My paediatric orthopaedic training at Alder Hey Hospital, Liverpool, had introduced me to pathologies characterised by spasticity in children, but the focus of my training had been in lower limb. I had enormously enjoyed working in paediatric orthopaedics, but knew that I wished to pursue a career in hand surgery and in the majority of units in the UK children’s hand surgery, including the surgical management of spasticity, is delivered by plastic surgeons. I was very keen to obtain experience in this subspecialist area under Dr. LeClercq as it would allow me to explore whether or not I wished to train further in the field with a further fellowship in children’s upper extremity surgery.

Dr. LeClercq’s practice spans the breadth of elective adult hand and wrist surgery, and in addition to this she has a renowned subspecialty interest in neuro-orthopaedics. Predominantly this comprises cases with cerebral palsy which present with spasticity in the upper limb. In addition, adult neuro-orthopaedic cases are seen in the clinic with a range of pathologies which include spasticity due to stroke, traumatic head injury, and also cases of peripheral nerve dysfunction due to acute injury, chronic injury, iatrogenic nerve injury, and neural compression syndromes.

During my six weeks visiting L’institut de la Main I was therefore able to get an overview of surgery for spasticity of the upper limb. This included cases where I learned the principles and techniques for tendon transfers for spasticity due to cerebral palsy e.g. biceps to triceps transfer for elbow flexion, and brachioradialis to extensor carpi radialis for wrist and elbow flexion. Of particular educational benefit was being able to assist Dr LeClercq in the Zancolli Lasso procedure for intrinsic muscle tightness in the hand, a technically challenging operation and one that I had not had exposure to during my UK orthopaedic training. I was aware that this procedure was both lengthy and technically difficult, and it was a real privilege to learn the principles of this technique from a surgeon who not only technically excellent but also very experienced, and thus able to explain the pitfalls, highlight the surgical pearls, and discuss decision making relating to this procedure which should only be undertaken in very specific patterns of intrinsic muscle dysfunction in the hand.

In addition to learning some of the key principles of soft tissue surgery for spasticity, in cerebral palsy but also other pathologies, I was also able to gain an insight into the range of bone and joint procedures involved in the surgical management of spasticity. Specifically, the management of the hyperflexed wrist which may be treated by either a plate or wires inserted in various configurations. This may require additional soft tissue management such as segmental lengthening of flexor tendons, which I saw performed on a number of occasions. As a whole, the experience at L’institut de la Main gave me a superb overview of the management of several neurological disorders characterised by spasticity in the upper extremity and will help me greatly in my future career.



**Picture 1:** Clockwise from top left: 1. Learning a new technique – endoscopic carpal tunnel decompression. 2. Dinner hosted by Dr. LeClercq atop the Centre Georges Pompidou; 3. Enjoying the cultural richness of Paris 4. Entering the operating rooms at L’Institut de la Main; 5. Sunset during the 2019 heatwave in Paris; 6. The team takes a break on the floor of the operating room.

Of enormous benefit during this period of the travelling fellowship was having a chance to see some alternative methods for managing common conditions affecting the wrist and hand that aren’t necessarily used in the UK with great frequency. For instance, the surgical management of carpal tunnel syndrome can be managed effectively in a number of ways, whether conservatively or operatively. In the UK during my training I had been taught to use an open approach for surgical decompression of the carpal tunnel in carpal tunnel syndrome. This technique is safe and effective and provides great benefit in a cast effective manner for patients with an often debilitating condition. The technique of endoscopic carpal tunnel release is a procedure which I was aware of but did not have training in as it is only rarely used as a technique in the NHS in the UK, but is an excellent option in this condition where surgical release has been deemed necessary. Dr LeClercq and several other hand surgeons at L’Institut de la Main use the endoscopic technique and have found it to be safe and effective in the surgical management of this condition, with few complications and a fast recovery for patients owing to the minimally invasive nature of the technique. Upon questioning Dr LeClercq as well as Professor Mathoulin at L’Institut about it’s use, I was informed that providing the case selection is good, and that the surgeon is properly trained in the technique, the results are equivalent in treating carpal tunnel syndrome to open release, whilst also providing the significant advantage that there are fewer problems with scar sensitivity, wound healing problems, and there is an earlier return to work and/or normal activity. This is a technique I would consider introducing to my practice in the UK, in selected patients. Other techniques I learned during my fellowship in Paris included the use of fat grafting of the median nerve in recurrent carpal tunnel disease, the management of trigger finger by a minimally invasive technique, the use of abductor pollicis longus sling as an adjunct to trapeziectomy for thumb carpometacarpal arthritis, and the treatment of glomus tumours in the digits via a lateral, nailbed sparing approach.

Overall the fellowship in Paris was a fantastic opportunity to see first hand how hand surgeons in France approach pathologies seen in the UK in a different manner, and gave an insight into how healthcare systems work in Europe and are managed by our French counterparts.

**Visit 2:** The Beth Israel Deaconness Medical Centre, Harvard Medical School, Boston, USA.

Dates: 06.08.2019 - 22.08.2019

The second visit of my travelling fellowship was to The Beth Israel Deaconness Medical Centre in Boston, USA. A level one trauma centre and one of the principal teaching hospitals of Harvard Medical School, the Beth Israel Deaconness Medical Centre provides all aspects of acute trauma care from both an orthopaedic and a plastic surgical perspective in the public sector for the south and west of Boston and wider community. I had been keen to visit this unit for some time, to see the way in which trauma services are coordinated and managed in the public sector in a busy US level 1 trauma centre, and to see how the hand and upper extremity service functions both as an independent unit and is integrated within the trauma unit as a whole to provide high quality upper expremity trauma surgery and care both for isolated upper limb injuries and also in the context of polytrauma patients presenting to the emergency trauma services.

 The hand and upper extremity unit at The Beth Israel Deaconness comprises three hand surgeons (Prof. Tamara Rozenthal, Dr Carl Harper, both orthopaedic hand and upper limb surgeons, and Dr Sammy Dowlatshahi, a plastic surgeon with an interest in hand and upper extremity reconstruction and microsurgery). I was attached to Professor Rozenthal for the duration of the attachment but was also able to gain some experience with Dr. Harper and Dr. Dowlatshahi which enabled me to see the breadth of hand and upper extremity care at the unit. In addition, there were weekly morning lectures/ seminars presented by trainees and fellows and attended by the senior attending surgeons as well as, on occasion, senior plastic surgeons such as Dr Joseph Upton, a very experienced plastic hand surgeon whose practise spans adult and paediatric hand surgery including congenital hand differences. These sessions were invaluable in providing formal didactic educational teaching during my visiting fellowship and provided me with an insight into how medical / surgical training is organised and delivered in the US. It was clear that the approach to teaching and training at Harvard medical school was well structured and organised, and the residents and fellows are well motivated and keen to learn. The senior attending surgeons would ask plenty of questions of their trainees and teach in a calm and didactic manner. The atmosphere in the educational sessions wad therefore highly conducive to learning and had, upon my observation, the ideal balance between formal information sharing and high quality academic discussion with an inclusive team based approach. This aspect of education is something I will remember and would aim to emulate in my future practice when I am involved in contributing to or organising hospital or university based teaching for trainees of any level.

 I was struck by how well organised the outpatient clinics were, yet in addition to the quality of organisation I was also very aware that outpatient services appeared identical to the type of service I have been trained within in the UK national health service. Hand surgery elective/trauma combined clinics, particularly that of Dr Harper, were high volume, high turnover clinic with electronic casenotes and digital dictation platforms that were efficient and user friendly, allowing each doctor to move between patients swiftly and complete the clinic in good time.

 In the operating room efficiency was also noticeably to a very hand standard, with the operating list commencing at 8am and rapid turnover so that the equivalent of a full day hand surgery operating list in the UK (typically between 9am and 5pm) could be completed by approximately 2pm. The attending surgeon typically had a fellow and a more junior trainee present allowing administrative duties and the setup of patients to be completed swiftly and facilitating the smooth running of the operating list.



**Picture 2:** Clockwise from top: 1. The Beth Israel Deaconness Medical Centre; 2. Early start for theatre lists 3. The grand lobby at the Carl Shapiro Orthopaedic Centre; 4. The original Massachusett’s Deaconness Medical Centre; 5. Sunset at Boston Harbor.

 I observed a range of hand and upper limb cases over the three week fellowship, with a range of pathology similar to that seen within a typical UK hand surgery practice. There were very few technical differences in the way that common pathology that I am used to treating myself such as carpal tunnel surgery, trigger digits, distal radius fracture fixation. This was in many ways a pleasing aspect to see, in that it was educational in and of itself to learn that the UK and the US do not differ, broadly speaking, in the way that surgical conditions of the hand and upper extremity are managed either in outpatients or in the operating theatre.

 When discussing surgical training with fellows on the Harvard hand surgery training programme, I learned that typically a 6 year residency programme in trauma and orthopaedics would commence within 2 or 3 years after finishing medical school, followed by a nationally selected 1 year fellowship in hand or hand and upper extremity surgery. This therefore meant that surgical trainees pursuing a career in hand surgery would experience usually 1-2 years of pre-residency internship and then 7 years of trauma and orthopaedic training, with the final year being purely hand surgery training. Total training time would then typically be 8-9 years. By contrast in the UK there would typically be 2 years of foundation training, then 2 years core training in surgery, a 6 year registrar training programme and 1-2 year of fellowship training in hand surgery, totalling 11-12 years. I was struck by how much younger the fellows were than me, and it seemed clear that training in the US is shorter but more intense and targeted with a more rapid approach to the acquisition of skills and competencies.

**Visit 3:** Ganga Hospital, Coimbatore, India.

Dates: 10.03.2019 – 16.03.2019 (visit shortened due to COVID-19).

The final section of my BOA travelling fellowship was a visit to Coimbatore in India, to complete an observership and microsurgery skills course at Ganga Hospital and visit the department of Hand and Microsurgery, directed for many years by Dr. Raja Sabapathy. Dr. Sabapathy is a plastic hand and microsurgeon, and an honorary professor with the University of Edinburgh. He codirects the hospital alongside his brother who is an orthopaedic surgeon. Their father who was also a surgeon built the hospital several decades previously and it has gone from strength to strength to become a quaternary referral centre for all aspects of orthopaedic and plastic surgical trauma care. The team at Ganga are well known worldwide for the surgical management of complex trauma including upper and lower limb injuries and burns. The range of pathology seen at the unit is virtually unparalleled in the UK and most of Europe, Ganga has been at the forefront of many developments in the management of complex soft tissue defects in association with bone injuries, such as macro- and micro- replantation of upper and lower limbs, for many years.

My first trip to India was 12 years previously when I attended my first international hand surgery conference in Bangalore, which was a joint meeting between the British Society for Surgery of the Hand and Indian Society for Surgery of the Hand. I was so impressed with the quality of the work and presentations at that meeting when I was a junior surgical trainee that it cemented by desire to contribute to the academic community in hand surgery and attend international meetings. In particular, I developed an affection for Indian culture and for the work undertaken by hand and trauma surgeons in India. On that visit I watched a live surgery demonstration of a syndactyly release by Dr. Sabapathy who was leading the congress, and learned that Ganga hospital, in the same region as Bangalore but a different city, was a unit of exceptional standards, and one that I would be keen to visit at least once during my career.

 I had therefore long been looking forward to this trip, and unfortunately it had been cancelled the previous summer after my Paris and Boston visits, as my employer had requested but I start my UK hand fellowship early, owing to staffing issues. After several months of my UK hand fellowship, I took the opportunity to take some study leave and annual leave to enable me to complete my planned fellowship. This was a destination that I had been planning to visit for a number of years during my surgical training, and I felt very pleased that I was finally in a position to go to such an important destination for many hand surgeons in the UK and the wider surgical community. I saw this trip alongside my visits to Paris and Boston the previous summer as one of the principal highlights of my career to date.

Upon arrival in Coimbatore I was very helpfully introduced to various members of the team, Mr, Seshagiri, the general secretary of Dr. Sabapathy who is closely involved with the wellbeing of visiting fellows to Ganga. Seshagiri made me feel fantastically welcome, and showed me to the apartment near the hospital which I was due to share with two other international fellows from Japan and Finland.

I was struck by how straightforward many of the systems in place for patient management were, with a clear route through the hospital for emergency patients from triage, through the emergency room, and on to either the wards or to an operating theatre. The plastic surgery department ran trauma lists in two theatres seven days per week, with most lists running late into the night having started at 8am. There were formal educational meetings every day including Saturdays, during which a resident or training surgeon would present a case and generate discussion based on the FRCS examination curriculum. This was structured formally, and questions were posed by the senior faculty present to the presenter in *viva voce* style. I enjoyed this approach and I wondered if this was likely to continue in the UK – I had experienced this formal educational meeting style at a number of units in the UK, but rarely at 0730hrs.

Outpatient clinics were extremely busy with large volumes of cases presenting to the busy outpatient rooms. Long tables were present with clinicians of varying degrees of seniority seeing a steady stream of patients with a range of upper limb pathologies. Consultations were often quite brief and direct, with often complex management plans put in place. Ward rounds were conducted directly after the morning meeting, led by the consultant of the day who would normally have chaired the 0730h educational meeting.

On my first ward round I was struck by the complexity of bone and soft tissue pathology being dealt with on a daily basis at Ganga. Some of the injuries that had required surgery would be quite rare or not seen at all in the UK – the first replant case that I saw on a ward round was an upper limb macroreplantation at humeral level. The patient was well, and was sitting up in bed smiling with his family. It seemed clear that the experience for trainees at Ganga hospital would clearly be quite different to those on an orthopaedic or plastic surgical rotation in the UK, with much more complex trauma at a higher volume, and so surgical experience and decision making with complex pathologies would most likely be achieved relatively quickly.



**Picture 3.** Clockwise from top-left: 1. Busy ward rounds on the upper limb unit at Ganga; 2. The triage area at the front of the Emergency department; 3. My Finnish colleague Joona, who was the first of us to fly back to Europe as the COVID19 pandemic worsened; 4. The entrance to the renowned Plastic Surgery unit at Ganga hospital; 5. Glad to be flying home amidst the global pandemic; 6. The busy Intensive care Unit at Ganga hospital.

I had been monitoring the news relating to the COVID-19 viral pandemic regularly during late February and early March, with increasing numbers of cases being seen in Italy and subsequently in Spain. I had considered whether to postpone my trip to Ganga in the days prior to leaving, as there was a small risk that global travel restrictions may become effective during the time that I was away, However, Indian visas were still being issued and the UK was not, at the time that I was leaving for India, placing any specific restrictions on travel or asking its citizens to remain at home.

My family had been expressed their concern for a few days before I heard the news that the first cases of COVID-19 had been identified in Delhi. The situation in Europe appeared to be changing rapidly with news that many countries were considering significant travel restrictions for those abroad. I became concerned that I may become stranded in a country with sometimes very busy airports, and at the time, with little way of knowing how things would develop in either India or in Europe, I began to consider flying home from my fellowship early. The following day, a Friday, over dinner with my colleagues, it was announced on Indian TV news that the following Friday would see a lockdown imposed throughout India. I had been planning to undertake a microsurgery skills course at Ganga in their microsurgical skills laboratory the following week, and I became concerned that if I undertook this course, at considerable expense, I may be risking being stranded in Coimbatore for some time. I discussed matters with both my family and my supervisors at Ganga, and decided that I ought to make arrangements to travel back to the UK and cut my fellowship short at this uncertain time.

Upon arriving back in the UK the British government did indeed enforce a ‘lockdown’ for the public within days, and in addition I watched with interest on the news the same situation unfold in India. Many travel restrictions were being placed on international travel, and it became clear that I had made a good decision to return to the UK when I did. The relatively short stay that I had at Ganga was genuinely enlightening, and although it was disappointing to miss out on the microsurgery training at Ganga, I have been able to compete a similar training course in the UK since my return. I plan to return to the unit at some point in the coming years, at a safer and more settled time, to continue to learn the principles of complex soft tissue reconstruction in upper extremity trauma, and I very much looking forward to doing so.