Education and Travel Bursary 2011/12

Report for the BSSH Education and Training Committee

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Introduction

With the support of the British Society for Surgery of the Hand, I was fortunate enough to be able to undertake a three month fellowship in hand and microvascular surgery between November 2011 and January 2012. The fellowship was divided into two parts: in November and December 2011, I was the Bruce Bailey Fellow at Ganga Hospital, Coimbatore, India; in January 2012, I was visiting fellow at the Department of Plastic and Reconstructive Surgery, University of Tokyo, Japan. In this report, I will detail my experiences at both institutions, the knowledge I have gained, and the implications for my future career.

Part 1: Ganga Hospital, Coimbatore, India

The Bruce Bailey Fellowship

Dr Raja Sabapathy of Ganga Hospital, Coimbatore, in cooperation with the British Society for Surgery of the Hand has offered the Bruce Bailey Fellowship since 2002, in memory of Mr Bruce Bailey. Bruce Bailey was a Yorkshireman, born in 1928, who completed medical school at the London Hospital. His initial surgical training was in the Army, where he rose to become Senior Surgical Specialist, before completing his plastic surgery training at Stoke Mandeville Hospital, under the tutelage of J.P.Reidy – one of Kilner's disciples. He took up a consultant post at Stoke Mandeville in 1963, and worked there until his retirement in 1990. He was a general plastic surgeon, but his main love was hand surgery. He was also quick to take up technical advances within plastic surgery, and this lead him to embrace microsurgery, making Stoke Mandeville one of the leading microsurgical units in the 1970s. He also had a great love for India, and became a visiting surgeon at the Gujarat Cancer Institute. This lead to several young Indian surgeons visiting Stoke Mandeville for training, one of whom, in 1989, was Dr Raja Sabapathy. On hearing of Bruce Bailey's death in 2001, Dr Sabapathy established the prestigious Bruce Bailey Fellowship, in order to provide advanced training in hand surgery and reconstructive microsurgery. I was fortunate to become the ninth Bruce Bailey fellow.

Ganga Hospital

Ganga Hospital is a private institution in Coimbatore, Tamil Nadu, India. It was founded in 1978 by Dr. J.G. Shanmuganathan, father of Dr Sabapathy, and the 80 year old chairman of the organisation. Initially, the hospital comprised just 17 inpatient beds, but has grown over the years to become a major centre for Hand and Microsurgery, Trauma Surgery, Neurosurgery, and Orthopaedic and Spine Surgery. The current hospital, opened in 2007, has 450 inpatient beds. In 1999, Ganga hospital also became the first in India to host a Microsurgery laboratory training course, and now runs over 25 such courses per year.

Clinical Experience

The Department of Plastic Surgery comprises four plastic surgery consultants, one maxillofacial surgery consultant, and three consultant anaesthetists, providing 24 hour care. In 2011, a total of 8893 operations were performed in the department, including 3133 hand surgery procedures. The weekly timetable for the department is shown below:

Day	Morning	Afternoon
Monday	Ward round OPD	Theatre
Tuesday	Theatre	Theatre
Wednesday	Teaching Ward Round OPD	Theatre
Thursday	Theatre	Theatre
Friday	Teaching Ward Round OPD	Theatre
Saturday	Theatre	Theatre
Sunday	Rest	

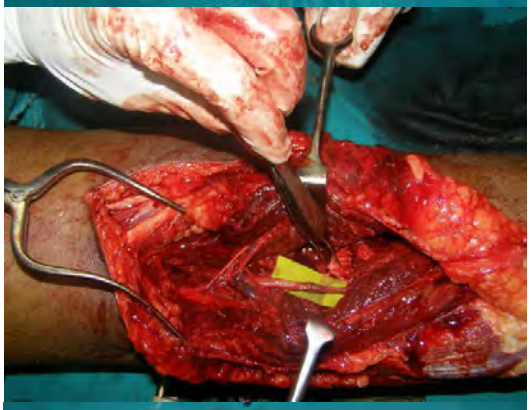
Morning activities, including the active teaching timetable, begin at 0730. The outpatient clinic begins at 0930. It was not unusual, if there was a particularly large burden of trauma cases, to begin a free flap for wound coverage at 0730 on an outpatient clinic day, and have completed the procedure before the start of the clinic.

Each outpatient clinic comprised of between 70 and 100 patients, of whom around 20-30 would be new patients. The variety of problems and pathologies encountered was enormous. Of course, there were many routine cases – carpal tunnel syndrome, trigger digits, hand fractures, and even two cases of Dupuytren's Disease – but there were also very large numbers of cases which are uncommon in the UK. For example, each clinic had on average two to four new adult post-traumatic brachial plexus palsy patients and one new birth brachial plexus palsy, as well as around 5-10 post-operative follow-up brachial plexus cases. Also, I was fortunate to see many early, intermediate, and late follow-up cases of major limb replantation. This is a particular specialty of Ganga hospital – the large numbers of cases are a result of poor health and safety regulations in the textile mills for which Coimbatore is famous. The intermediate and late replantation follow up cases were particularly interesting, as planning their secondary reconstruction is challenging, and the principles learnt, for example the use of arthrodesis and tendon transfer, tendon grafts, tenolysis, can be transferred to secondary reconstruction in other cases. I also saw some exotic conditions I had not previously encountered, for example TB of the wrist, and Hansen's disease.

My experience in the operating theatre was equally busy and varied. The structure of the service for trauma patients was very different to the UK, and worked extremely well. On receipt of a major trauma patient in the emergency department, they were immediately transferred to the resuscitation room, which is located within the plastic surgery theatres. Here, they were received by the consultant anaesthetist on-call, who coordinated the patient care from that moment. One of the first actions taken by the anaesthetist is to place a regional block, in order to free the patient from pain. This "block on arrival" philosophy, allows firstly relief of pain an d anxiety for the patient, and secondly a thorough pre-operative assessment of the wound by the plastic surgery team. Almost invariably, the subsequent surgery is performed under this regional anaesthesia – including major limb replantation and revascularisation. Indeed, well over 70% of all surgery in the department is performed under regional anaesthesia, with general anaesthesia reserved for small children – note that the picture here shows a gracilis free flap in an 11 year old under regional anaesthesia – and operations such as brachial plexus exploration which can't be performed under regional anaesthesia.

A typical operating list, from 27th December 2011, is shown below:

Case Number	Diagnosis	Operation
1	Cleft Hand	Snow-Littler Procedure
2	Hand/Forearm Wound	Free ALT flap
3	2 month old partial ulnar nerve injury	Excision of neuroma and sural nerve graft
4	Male pattern baldness	Hair transplantation
5	Mandible fracture	ORIF
6	Cleft Lip and Palate	Cleft lip and anterior palate repair
7	Grade 3B Tibial fracture, intra-abdominal bleed	Laparotomy, repair liver laceration, debridement and ex-fix leg
8	50% Burns	COD
9	Leg wound	SSG
10	35% Burns	COD
11	Keloid scar both ears	Intralesional excision
12	Traumatic ear loss	Second stage total ear reconstruction
13	Cerebral Palsy, finger and wrist contractures	Fractional lengthening FDP, FCU to ECRB
14	Finger proximal phalanx #	K-wire fixation
15	Groin flap for thumb wound	Division of pedicle
16	PIPJ contracture	Release
17	Heel pad avulsion	Debridement
18	Boutonniere deformity	Boutonniere correction
19	Failed popliteal artery repair	AKA
20	Thumb tip injury	Terminalisation
21	Finger laceration	Explore and suture
22	Open pelvic fracture with intra-abdominal bleed	Laparotomy



With such a variety of cases available, it is easy to lose focus, so I decided to concentrate on replantation surgery, brachial plexus reconstruction, and microvascular limb reconstruction. I will illustrate this experience with the one case of a major replantation which presented during my time at Ganga. The patient was a thirty-five year old female mill worker who suffered a crush/avulsion amputation of her right upper limb at the forearm level one hour before presentation. After resuscitation and brachial block anaesthesia, we performed a radical debridement of the wounds, identifying vessels and nerves, removing all distal muscle and avulsed flexor tendons, and shortened the bone by 5 cm. The trauma surgeons were then called to fix the forearm bones, following which the nerves were repaired, and the limb was re-vascularised. The ischaemic time was four hours. Immediate flow was obtained, and the wound were sutured. She had an uneventful post-operative recovery. She will require long-term follow-up, and future secondary reconstructive procedures in order to regain long flexor function to her little and ring fingers and thumb reconstruction, but her outcome will be vastly superior to below elbow amputation and prosthesis.

Conferences

I was fortunate enough to attend two national conferences during my time at Ganga. The first was the Indian Society for Surgery of the Hand Conference in Manipal, Karnataka. Most of the department attended this conference, and indeed Ganga Hospital presented the most papers at the conference, and the Hand fellow Dr Praveen Bhardwaj won the prize for best paper. We travelled to the conference by overnight train, which was an excellent team bonding experience! There were many interesting talks given at the meeting, but for me the standout lectures were on wrist examination and wrist arthritis, given by Dr Wolfgang Huber.

The second conference was a Brachial Plexus workshop with live surgery sessions, held at the All India Institute of Medical Sciences (AIIMS), New Delhi. This conference was organised by the neurosurgery department of AIIMS, and as such, the focus was chiefly on nerve grafting and nerve transfers for brachial plexus palsy. The most interesting operation shown was a free functioning gracilis transfer for restoration of elbow flexion, performed by Dr Sabapathy and Dr Hari from Ganga! This conference also allowed me to visit the Taj Mahal – an iconic structure, and surely one of the wonders of the modern world.

Social and Cultural Interaction

Beyond clinical and academic activities, this fellowship has also provided me with some valuable and interesting social and cultural interactions. I formed good friendships with the faculty and fellows of Ganga, including Dr Babu Bajantri, Dr Hari Venkatramani, Dr Kannan Balaraman, Dr V Ravindra Bhat, Dr S Raja Sabapathy, and Dr Ravindra Bharathi. The team all spent Christmas Eve and Christmas Day together at the family home of the Senior Registrar, Dr Sanjai, in the Western Ghats. A truly memorable Christmas. Throughout my time at Ganga, a Russian Hand surgeon from Moscow, Dr Andrew Maximov, was also visiting fellow. We developed a good friendship, and exchanged many viewpoints and ideas, each challenging the other's assumptions. Differences were usually resolved of an evening over a cup of excellent Indian tea.

Ganga also provided me with succinct lessons on how to manage an organisation. The value of such an organisation can be measured in both the way it treats its employees, and the way it deals with the poorest in society. At Ganga, the employees are treated exceptionally well, and they are therefore fiercely loyal to the organisation. In order to commemorate the 80th birthday of the Chairman, a day of festivities, including a dance competition, was undertaken. Here, a monetary bonus was paid to all staff, clinical and non-clinical, graded by the length of time they had worked at the hospital. The longest serving team member was a plastic surgery nurse with over 28 years' service. At the same event, a health insurance scheme was announced to provide cover for all employees with over three years' service, and all employees families for those with over five years' service. In terms of social responsibility, Ganga has often been criticised, as it is a private institution

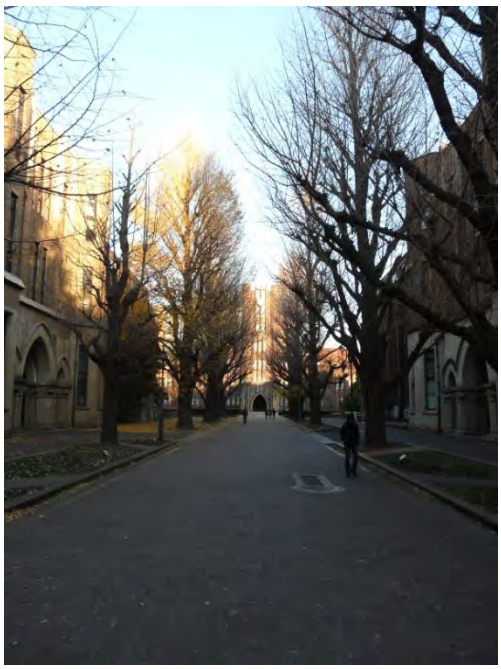
and patients must pay for care. However, costs are kept extremely low – less than £700 for a free flap reconstruction, and frequently surgery is performed for free for the neediest. Furthermore, the active involvement of Ganga with government schemes and charitable organisations allows many operations to be performed free of charge for the poorest patients.

Future

Being the Bruce Bailey Fellow 2011 has fostered within me a great admiration for India as a dynamic country, and for Indian hand surgeons and microsurgeons in particular. I intend to preserve my links with India in the future. India has an enormous population, and therefore represents a large untapped resource for answering clinical questions in the form of clinical trials. There are relatively few institutes undertaking such studies in India, and the development of this will not only benefit Indian patients, but also allow more rapid conduction of such trials, leading to benefits throughout the world of hand surgery. I hope to be able to help develop this in the future.

Part 2: Tokyo University Hospital – Prof. Isao Koshima

Introduction



The University of Tokyo, also known as "Todai" was established in 1877 as the first national university in Japan. As a leading research university, Todai offers courses in essentially all academic disciplines at both undergraduate and graduate levels and conducts research across the full spectrum of academic activity.

Prof. Koshima is the professor of plastic and reconstructive surgery at the University of Tokyo. He is also a pioneer in the field of microsurgery. He developed the concept of perforator flaps, and described two of the most commonly used flaps inmicrosurgery today – the deep inferior epigastric artery perforator flap (DIEP), and the anterolateral thigh flap (ALT). He is also the father of the field of supermicrosurgery – the successful anastomosis of vessels with diameters ranging from 0.2 to 0.8 mm. He has applied these techniques to describe many new concepts in reconstructive surgery, including fascicular turnover flaps for nerve repair, and lymphaticovenular anastomosis for lymphoedema.

Fellowship

I arrived in Tokyo on New Year's Day 2012. The temperature was a stark contrast to Coimbatore, but I had a couple of days to acclimatise before beginning my fellowship on the 4th January. The weekly timetable for Prof. Koshima is shown below:

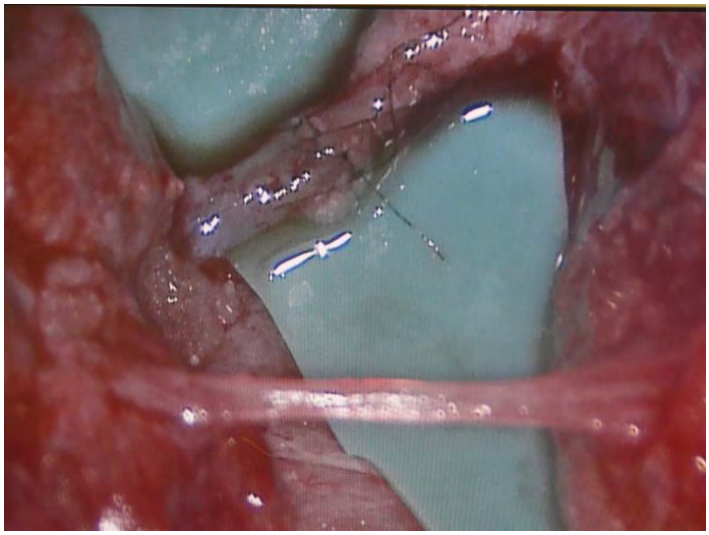
Day	Morning
Monday	Theatre
Tuesday	Outpatients
Wednesday	Teaching, Theatre, Case Discussion
Thursday	Theatre in peripheral hospital
Friday	Theatre
Saturday	Rest
Sunday	Rest

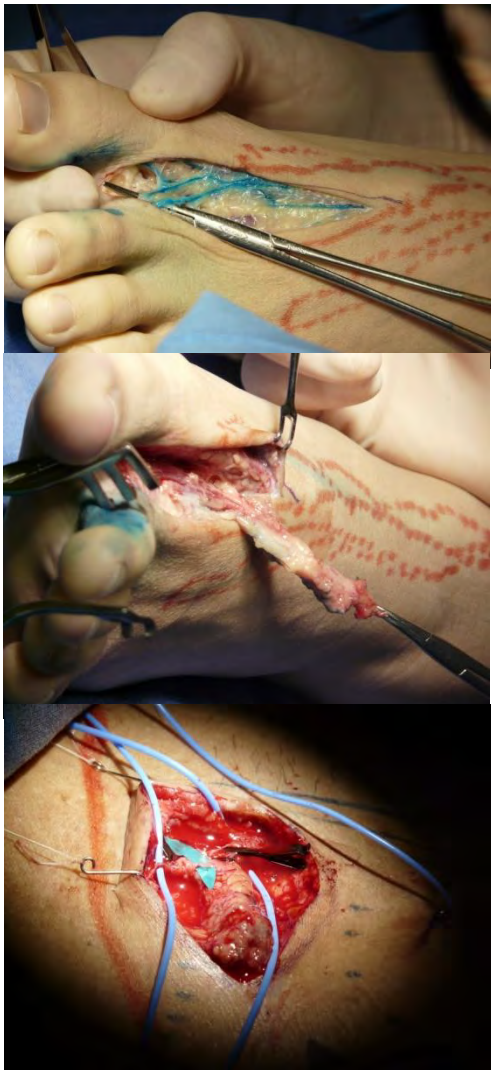
Outpatient days were extremely busy, with clinic starting at 0900 and typically finishing at 1800, following which the cases to be operated on the following day were seen in the ward. The range of cases seen in clinic was again large. Prof. Koshima tends to use perforator flap reconstructions more liberally than I have previously seen, demonstrating to me the possibilities of such an approach. In a typical clinic, on the 5th January 2012, we saw the following cases:

5 new lymphoedema cases; 14 post-op lymphaticovenular anastomoses for lymphoedema cases (including upper limb, lower limb, genital lymphoedema; both primary and secondary cases); 3 post-op free lymphatic channel flap transfer for lymphoedema; Left alar tumour for free auricular flap; venous malformation for sclerotherapy; Facial palsy for vascularised cross facial nerve flap; Post-op blepharoplasty; leg ulcer; post-op free perforator flap for hand burn contracture; foot reconstruction with vascularised nerve flap to posterior tibial nerve; Little finger arterio-venous malformation; multiple digital artery perforator flaps for congenital contracture; unstable scar elbow for TAP flap; Female to male gender re-assignment for scrotal reconstruction; facial palsy post-op static sling; Tessier cleft 1:13 for fat transfer to upper face; microcystic lymphatic malformation of tongue; post-op prophylactic vascularised cross facial nerve flap prior to schwannoma resection; Ulnar nerve lump, possible schwannoma; post-op eye enucleation for creation of eyelids; brachial plexus palsy; free flap thumb and index finger reconstruction.

Again, the variety of cases was large, but I focussed my attention on the assessment and management of lymphoedema. The prevalence of lymphoedema is thought to be between 1.3 and 1.8%, meaning close to 1 million people are affected in the UK. Upper extremity lymphoedema is commonly caused by treatment of breast cancer, and has been shown to significantly affect hand function as measured by DASH score (mean difference 23.4), as well as health related quality of life. Despite this, surgical treatments for lymphoedema available in the UK currently are limited. Treatment of lymphoedema in the upper extremity by lymphaticovenular anastomoses using minimally invasive supermicrosurgical techniques under local anaesthesia was first reported by Professor Koshima in 2000, and has been shown to be safe and effective in long term follow-up studies. It is far less invasive than traditional excisional techniques for treatment of lymphoedema.

During my visit, I was able to see the assessment of lymphoedema patients in the clinic. Then I observed the staging of the disease in the operating theatre using indocyanine green lymphography. Subsequently, I was able to watch and assist in close to one hundred lymphaticovenular anastomoses (LVA) in total. The technique involves multiple 2 cm incisions under local anaesthetic, careful blunt dissection to isolate lymphatic channels and sub-dermal venules, followed by supermicrosurgical anastomosis at high magnification using specially designed instruments (Koshima Ultramicrosurgical Set), and 11/0 nylon sutures. Between five and ten LVAs are performed per patient. Finally, I was able to assess the results of the surgery in the clinic. I am convinced that this technique is especially effective for either stage 1 or 2 lymphoedema, and that the majority of patients who fall into this category can abandon conservative measures (compression stockings, manual lymphatic drainage) and are effectively cured.





Patients with later stage disease are less likely to be cured by LVA, though most still improve. In a few patients I saw in clinic, LVA had not improved their lymphoedema. In these patients, Prof. Koshima performs a vascularised lymphatic channel flap transfer. I was fortunate to be able to observe this operation twice. Here, lymphatic channels from the first web-space of the non-affected foot are transferred to the groin based on the first dorsal metatarsal artery. It is crucial that these lymphatic channels are functioning normally before transfer, and hence they are first mapped by ICG lymphography, and if they are non-functional, for example in some bilateral cases, lymphatic channels from the axilla are selected for flap transfer. I saw some cases in which this procedure was effective, but not enough for me to draw firm conclusions on the overall success rate.

Social and Cultural Interaction

Again, the welcome extended to me as a guest in Tokyo was exemplary. I developed friendships with several members of the faculty and residents. I hope to continue these friendships going forwards. I was also fortunate enough to be invited to dinner with an international visitor – Dr Omer Ozcan from Antalya, Turkey. He is a world renowned microsurgeon who discussed his experience with composite tissue transplantation, including a recently performed uterine transplantation to allow fertility in a patient with Mullerian agenesis – a world first.

Future

I intend to establish a lymphoedema surgery service in the UK. To the best of my knowledge, no-one in the UK is performing LVA or lymphatic channel transfer for lymphoedema, and therefore this represents a significantly neglected patient group.

Conclusion

In conclusion, I have experienced an excellent fellowship. I have condensed a large amount of experience into three months. I have been exposed to techniques, pathologies, principles and cultures I had not previously encountered. Furthermore, I have met interesting and dynamic people who have inspired me. I wish to extend my thanks to the BSSH for supporting me in this fellowship.