BSSH Education & Travel Bursary Report 2024

Stephen Ali
PhD, FRCS (Plast)
Clinical Lecturer, Reconstructive Surgery & Regenerative Medicine Research Centre, Swansea University Medical School
Specialty Registrar, The Welsh Centre for Burns & Plastic Surgery

Location: Groote Schuur Hospital, Cape Town, South Africa
Dates: 21st October – 15th November 2024
Supervised by: Prof. Duncan McGuire, Martin Singer Hand Unit, Department of Orthopaedic Surgery

Introduction

I am deeply grateful to the BSSH Education & Travel Committee for supporting my visit to the Martin Singer Hand Unit in Groote Schuur Hospital, Cape Town. Founded in 1938, Groote Schuur, which translates as 'Great Barn' in Dutch, takes its name from the original Groote Schuur estate established by Dutch settlers during the founding of Cape Town in the 17th century. Today, it stands as one of South Africa's premier teaching hospitals. It achieved global recognition in 1967, when Dr. Christiaan Barnard performed the world's first successful human heart transplant here. Groote Schuur is not only known for this historic breakthrough but also for the high volume of complex trauma cases it manages due to Cape Town's challenging epidemiological landscape. The city has some of the world's highest per capita rates of violence-related injuries, including gunshot wounds and stabbings, which significantly exceed global averages and lead to a unique case mix at Groote Schuur Hospital. This environment places a high demand on the Martin Singer Hand Unit for peripheral nerve and brachial plexus surgery. The Martin Singer Hand Unit honours the legacy of Dr. Martin Singer, a pioneering hand surgeon whose dedication to advancing the field transformed Groote Schuur into a centre of excellence. Dr. Singer introduced numerous innovations in South African hand surgery, including the country's first, hand replantation and the establishment of dedicated clinics for congenital hand differences and brachial plexus injuries. The unit is now lead by Prof. Duncan McGuire who was my supervisor for the visit.

Objectives

My primary objectives for this fellowship were to deepen my experience with a high caseload of peripheral nerve and brachial plexus injuries and to broaden my understanding of orthopaedic hand surgery techniques, integrating them with my plastic surgery training.

Key Learning Outcomes

My first operative list at Groote Schuur showcased a remarkable array of procedures. From a brachial plexus exploration for a supraclavicular stab to soft tissue reconstruction with a posterior interosseous artery (PIA) flap, bilateral supinator to posterior interosseous nerve transfers, a first dorsal metacarpal artery flap, and an extensor indicis proprius to extensor pollicis longus tendon transfer, the variety was striking. This line-up underscored the team's depth of expertise and set the stage for an exceptionally enriching month ahead.

Due to frequent delays in patient presentation or missed injuries, direct neurosynthesis was often not possible, and nerve grafting was commonplace. In these cases, sensory branches from divided mixed nerves in the upper limb were preferred as a donor. I observed the use of Tisseel fibrin sealant for nerve coaptation without any microsurgical suturing—a streamlined technique that significantly sped up the process of performing neurosyntheses. This method proved time efficient given the high volume of cases, allowing the team to maintain effective graft stability while minimising handling and manipulation of the nerve.

In managing brachial plexus injuries, both obstetric (OBPI) and traumatic cases presented unique challenges. Groote Schuur handles many OBPI cases with established protocols for

optimising function, while TBPI cases require more adaptable and individualised strategies. I observed both supra- and infra-clavicular approaches to the plexus, with Prof. McGuire generously sharing numerous technical pearls on the surgical anatomy. To capture these invaluable insights—ranging from precise anatomical landmarks to subtle techniques for safe dissection—I took detailed notes, made anatomical drawings, and documented key techniques with photographs.

Tetraplegia management involved an organised approach based on the International Classification for Surgery of the Hand in Tetraplegia. I gained insight into the specific use of tendon transfers, including the brachialis to flexor pollicis longus for pinch grip and supinator to posterior interosseous nerve (PIN) for wrist extension. I also saw the use of supinator to posterior interosseous nerve and supinator to anterior interosseous nerve transfers – established and evolving nerve transfers to restore finger extension and flexion, respectively.

My exposure to elective orthopaedic hand surgery included cases of scaphoid fractures, Kienböck's disease, osteoarthritis, and rheumatoid arthritis, each requiring tailored management strategies. Scaphoid fractures were treated with percutaneous screw fixation when stable and bone grafting for non-union cases. For advanced Kienböck's disease, I observed the use of proximal row carpectomy to relieve pain and preserve wrist function. Thumb base osteoarthritis was managed with the Burton-Pelligrini technique, combining trapeziectomy with ligament reconstruction and tendon interposition. I had not previously encountered ligament reconstruction and tendon interposition in my training, and we discussed the literature surrounding this technique, weighing the evidence for and against its use in optimising outcomes. In rheumatoid arthritis cases, I observed sialastic PIPJ arthroplasty for pain relief and improved function—an invaluable approach given the limited accessibility of biologic therapies.

Soft tissue reconstruction was another critical area where I observed the hand unit performing complex reconstructions, including the PIA flap for coverage of the dorsum of the hand. During my plastic surgery training the PIA flap had a reputation for being unreliable… "If you want to see a dead flap, raise a PIA flap". Key steps to precisely identify the 5th and 6th intermuscular septa to safely locate and isolate the PIA vessel were shown to me which will hopefully mean I do not ever have to repeat this surgical aphorism..!

On my last day at Groote Schuur, the team managed a complex crush-avulsion macro-replantation at the mid-forearm level. Having previously only dealt with amputations up to zone IV, I found it enlightening to witness their meticulous approach to salvaging a limb at such a proximal level—a fitting conclusion to my time there.

Reflections and Conclusion

Reflecting on my time in Cape Town, I personally found it to be a safe and vibrant place to live, with a welcoming community both inside and outside the hospital. A memorable highlight of my visit was touring The Heart of Cape Town Museum at Groote Schuur, which offered a fascinating perspective on Dr. Christiaan Barnard's pioneering work in conducting the world's first heart transplant on the patient Louis Washkansky. The tenacity and

innovative spirit displayed in this historic achievement was palpable, and it mirrored the approach I saw daily in the Martin Singer Hand Unit. Just as Barnard pushed the boundaries, the hand unit's work in peripheral nerve surgery. Working alongside the South African orthopaedic surgeons was an incredibly rewarding experience—their expertise and camaraderie created a productive and collegial environment. They were more than happy to welcome a plastic surgeon into their ranks, but as a Welshman with the autumn rugby international season underway, I knew I was in for some friendly rivalry. It was not just about the specialty. It was also about Wales' record-equalling losing streak, while the Springboks were basking in their 2023 World Cup triumph. Needless to say, they had plenty of ammunition, which made for great fun in the theatre coffee room.

The sheer volume and intensity of work at Groote Schuur were unmatched. I experienced a 100-patient clinic filled with some of the most extreme and unexpected presentations. The team managed this demanding workload with high morale, efficiency, and cohesion, handling the day's relentless challenges with remarkable positivity. Their streamlined workflows, combined with a relaxed yet focused environment, enabled them to tackle even the most complex cases with ease.

The exposure to such a high volume of complex trauma cases at Groote Schuur Hospital provided me with invaluable experience, establishing a solid foundation in peripheral nerve surgery. This experience has prepared me well for my upcoming peripheral nerve fellowship in Australia and, ultimately, I hope for a future role as a consultant in the NHS. I am deeply grateful to the BSSH for making this opportunity possible.