APSS-SICOT Spine Fellowship

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Institution: National University Hospital, Singapore
Date of fellowship: 25 September 2017 to 13 October 2017
Visited Centre: Evangelisches Waldkrankenhaus Spandau, Berlin, Germany

Arrival day (24 September 2017)

Following my departure from Singapore, I took a flight which transited through Zurich to Tegal Airport of Berlin (TXL). The total flight time was approximately 15 hours. After reaching Berlin, I took a taxi down to the hospital (Evangelisches Waldkrankenhaus Spandau) which took a brief 20 minutes *(Figure 1)*. Through the security officer stationed at the hospital gate gantry, I was able to link-up with the orthopaedic on-call doctor who gave me a brief on how to find my accommodation. Following his instructions, I found my accommodation which was situated approximately 600 meters away from the hospital on the third floor. The manager of my accommodation was very nice. She showed me to my room *(Figure 2a-c)* and gave me a short introduction of the equipment in my unit.

Figure 1


Figure 2a


Figure 2b


Figure 2c

First week (25 September – 1 October 2017)

I started my clinical fellowship the next morning (Monday) by joining the daily morning X-ray discussion rounds *(Figure 3a-b)*. All orthopaedic cases including spine cases will be presented in this meeting which was conducted by the orthopaedic and spine department heads, Professor Nöth and Dr Alquiza respectively, and facilitated by a radiologist. I was very impressed with the organised manner the meeting was conducted and the active participation of the involved junior staff. This meeting gave me a fairly good idea of the type of cases managed by the unit.


Figure 3a

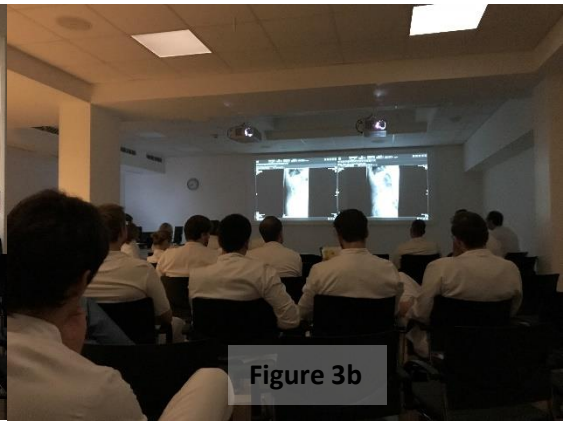
Figure 3b

The spine unit had a total of 4 spine surgeons. Dr Stephan Ender, the first spine surgeon whom I met, introduced me to their chief Dr. Miguel Alquiza. Almost immediately after, I was led into the operating room and allowed to join surgeries *(Figure 4a-c)*. The first surgery was a case of left L5/S1 prolapsed intervertebral disc for which a microdiscectomy was performed. Dr Alquiza is a fast and skilful surgeon. He used a midline approach and self-retaining retractors to gain access to the L5/S1 level. A laminotomy was performed with a high speed burr followed by a flavectomy. Thereafter, the nerve root was safely retracted and the disc was removed easily. The whole operation took barely 20 minutes. Another interesting case that deserves special mention was a patient with previous L3-5 interbody fusion, now presenting with proximal junctional failure. Stephan performed the revision surgery with extension of the fusion to include L2/3 using TLIF.

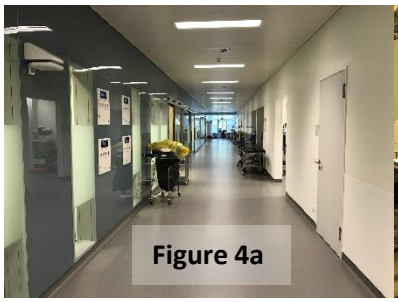
Figure 4a

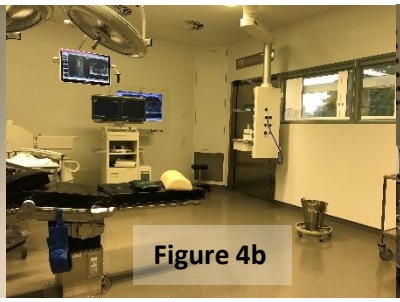
Figure 4b


Figure 4c

I met the remaining 2 spine surgeons on Tuesday - Dr Ralph Schernberger and Dr Tim Rumier von Ruden. That day, I joined Tim for surgery and we performed 2 cases together *(Figure 5a)*. The first case was bilateral balloon kyphoplasty for T12 compression fracture and the second case was a 2-level interbody fusion (L4/5 TLIF and L5/S1 PLIF) for L4-S1 spinal stenosis with L4/5 spondylolisthesis. For both cases, we performed the surgeries on our side and in the process, exchanged our ideas on the procedure. In the evening, Ralph brought me out for a nice tour around the hospital vicinity, and drove me down to the city to obtain a SIM card *(Figure 5b)*. He was extremely helpful throughout my entire stay in Spandau. Ralph was coincidentally one of the APSS traveling fellows this year who just returned from Goa, India where the APSS Annual Meeting was held.


Figure 5a

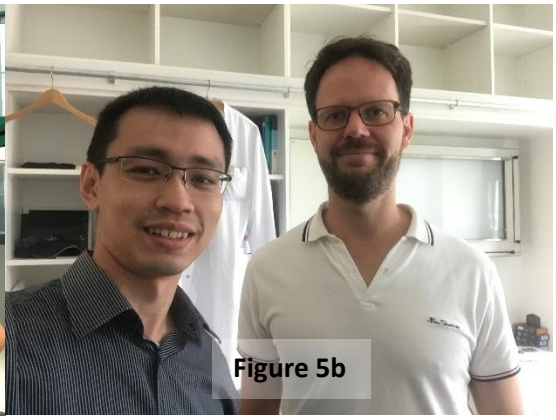
Figure 5b

Wednesdays were days without surgery but the first Wednesday happened to be the last day of work for Tim. After the morning rounds, I joined him in the outpatient clinic where we saw patients together. Tim was very nice and he would not only introduce me to his patients, but also translate their history to allow me to understand their conditions better. I observed him performing injections into the SI joint as well as epidural injections in the afternoon *(Figure 6)*. Thereafter, the spine team went out for dinner as a form of farewell party for Tim and welcome dinner for me *(Figure 7)*.

Figure 6

Figure 7

The remaining days of the week was filled with exciting surgeries. Some examples include 2 patients with severe degenerative disc disease of L4-S1 associated with an L4/5 grade 1 spondylolisthesis. Both patients received PLIF for L5/S1 for better chance of fusion and TLIF for L4/5. I had the privilege to participate actively in both surgeries. In addition, there was a case of multilevel vertebral compression fracture for which bilateral balloon kyphoplasty was performed from L1-L4 *(Figure 8),* and another case of facet joint arthropathy at L5/S1 for which bilateral endoscopic facet joint denervation was performed. Both cases were performed by Ralph. On thursday evening, I attended a course on dynamic fixation and was very impressed by the technological advances in Germany *(Figure 9)*.

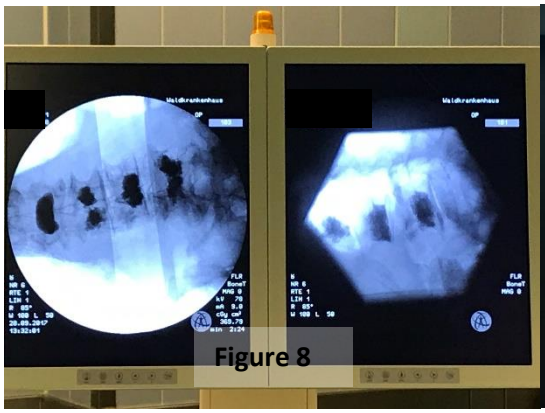

Figure 8

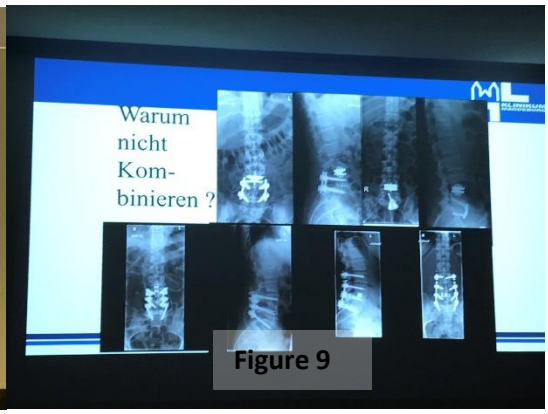

Figure 9

Life is always a balance between work and social activities. Since the weekdays were filled with work, the weekends were naturally reserved for leisure. With Ralph as my esteemed tour guide, we visited several places in Berlin - Tempelhofer airport (park), Potsdamer Platz, Tiergarten, Holocaust Memorial, Brandenburg Gate, Reichstag Building, House of World Cultures, and Sony Centre before having dinner together at a typical Berlin restaurant. Throughout the entire outing, I was very impressed with the amount of history and general knowledge he had on Berlin!

Second and third week (2 October – 13 October 2017)

Apart from second Tuesday which happened to be a public holiday, the rest of the weekdays were spent on clinical activities and surgeries. Daily morning X-ray meetings were conducted as per usual. I was invited to deliver a presentation on the third week Monday. This talk was entitled “MIS Instrumentation in Spine Surgery – Maximised Benefits Despite Limited Corridor” and was well received. Through this presentation, I shared my concepts on MIS spine surgery and their application in deformity correction. For both Wednesdays during these 2 weeks, I joined Ralph in seeing his patients. Again, it was very nice of him to translate to me the patients’ clinical presentation in English. In addition to the cases we saw, I was amazed at the efficiency of the clinics and its structure. Each clinic consultation room was situated just adjacent to the administrative counter *(Figure 10a-b)*, and they were spacious to allow proper gait observation.

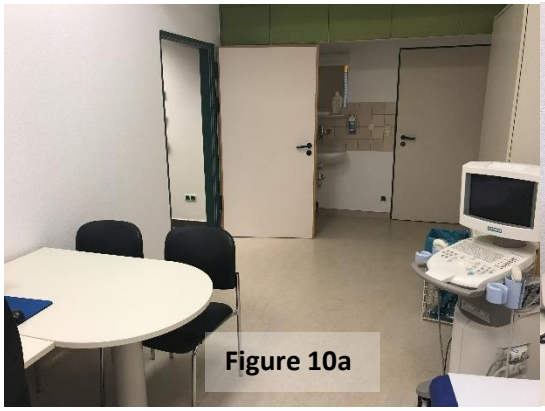

Figure 10a

Figure 10b

Many more interesting surgeries took place during these 2 weeks (refer to logbook attached - Annex A). Those that deserved special mention include a case of right microdiscectomy at L2/3 performed by Dr. Alquiza in a patient with prolapsed intervertebral disc and concomitant lateral subluxation of L2/3. This was a difficult case as preservation of key structures was necessary to avoid causing further deterioration to the patient. I had the privilege to assist him in this surgery. We also performed a case of L4/5 bilateral decompression with instrumented fusion using PLIF together on a patient with spondylodiscitis and anterior epidural abscess at L4-L5 *(Figure 11a-b)*. Through this surgery, I managed to learn many things from him sharing his own personal experiences. In addition, I also assisted him in the removal of a far lateral disc prolapse *(Figure 12)* and cervical artificial disc replacement surgeries *(Figure 13a-b)*.

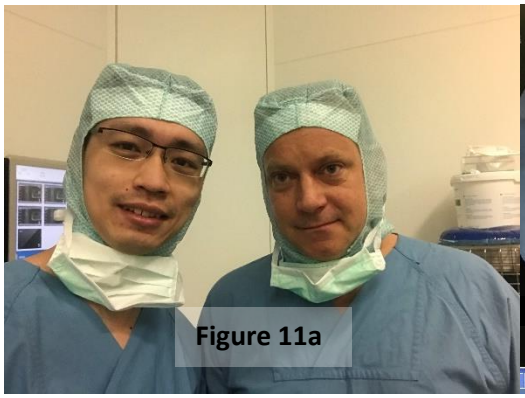

Figure 11a

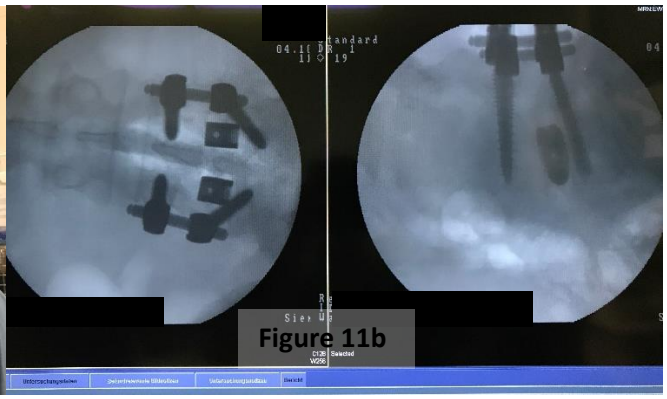

Figure 11b

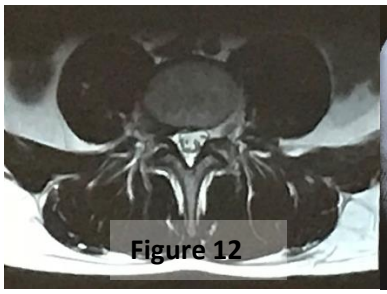

Figure 12

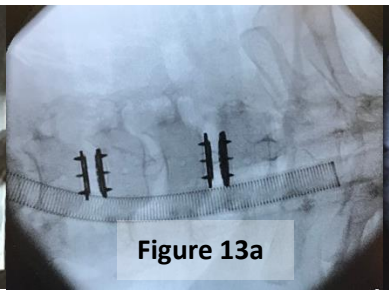

Figure 13a

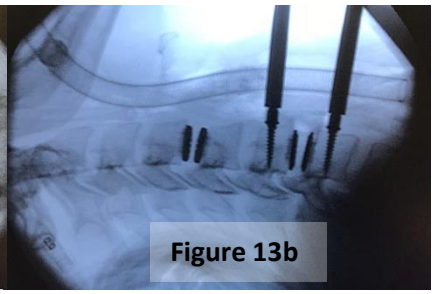

Figure 13b

I also joined Ralph in many of his surgeries which include an exciting case of L5/S1 pseudoarthrosis post-long segment instrumentation and fusion down to S1 in an elderly patient with severe osteoporosis. She had severe bilateral buttock pain and felt that the pelvis could not support the spine especially during changes in posture. Both her S1 screws were loose on imaging. We performed extension of fusion into the pelvis using S2AI screws and in-line rod connectors after cutting the rods with a tungsten carbide saw and removing the S1 screws*(Figure 14a-b)*. This was the first time I witness a rod cutting saw which was very different from the tungsten carbide burr that I use. It is much faster and produces much less metallic dusts.

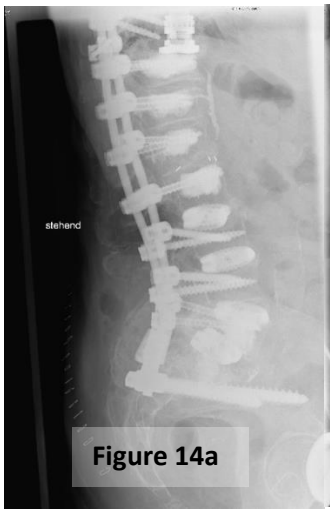

Figure 14a

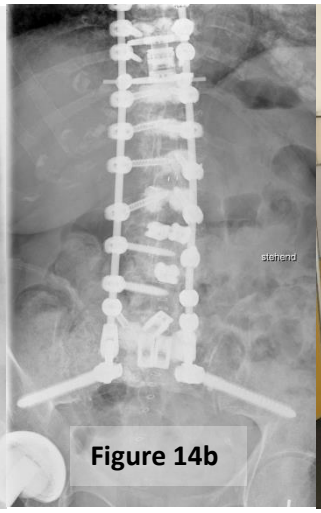

Figure 14b

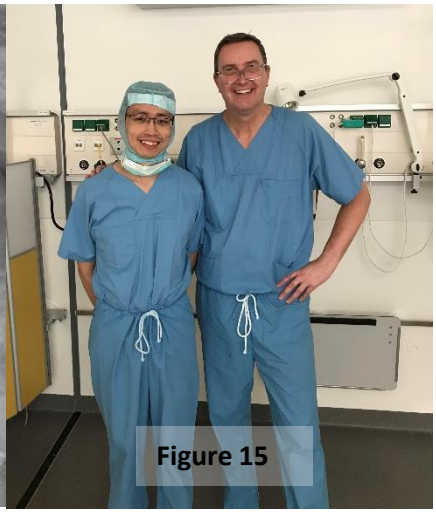

Figure 15

This clinical fellowship was exciting and filled with numerous learning values. To conclude, I would like to thank APSS and SICOT for sponsoring this clinical spine fellowship program. It is definitely a good avenue to exchange ideas and foster strong bonds across the globe. I hope this would become a tradition to benefit future spine surgeons who love to pursue clinical excellence and broaden their horizons. I would also like to thank my host hospital for making my stay in Spandau so fruitful and memorable. Special thanks goes to Dr Miguel Alquiza (Head of Spine Surgery), Professor Ulrich Nöth (Head of Orthopaedic Surgery) *(Figure 15 above)*, Dr Ralph Schernberger, Dr Stephan Ender and Dr. Tim Rumier Von Ruden. To Ralph who has so meticulously taken care of all my social activities, I must once again thank you for the unbeatable hospitality you have given me! Thank you!

Annex A

Date	SN	Surgical Procedure	Diagnosis	My Role
25-Sep	1	L5/S1 left microdiscectomy	L5/S1 left prolapsed intervertebral disc with inferior migration	Assistant
25-Sep	2	T6 unilateral transpedicular kyphoplasty	T6 acute osteoporotic fracture	Observer
25-Sep	3	L2/3 bilateral decompression with L2/3 left TLIF	Proximal junctional failure L2/3 s/p L3-L5 instrumented TLIF fusion	Observer
26-Sep	4	T12 bilateral transpedicular kyphoplasty	T12 acute osteoporotic fracture	Surgeon 2
26-Sep	5	L4-S1 bilateral decompression with L4/5 PLIF, L5/S1 left TLIF	L4/5, L/S1 spinal stenosis with disc degeneraton and L4/5 spondylolisthesis	Surgeon 2
26-Sep	6	T9, L5 bilateral transpedicular kyphoplasty	T9 and L5 acute osteoporotic fracture	Observer
28-Sep	7	L4-S1 bilateral decompression with L4/5 right TLIF, L5/S1 PLIF	L4/5, L5/S1 spinal stenosis with severe disc degeneration and L4/5 spondylolisthesis	Surgeon 2
28-Sep	8	L1, L2, L3, L4 bilateral transpedicular kyphoplasty	L1, L2, L3, L4 subacute osteoporotic fractures with L1 vertebral body cleft	Observer
29-Sep	9	L5/S1 bilateral endoscopic facet dennervation	L5/S1 bilateral facet joint arthropathy and pain s/p L5/S1 bilateral positive facet blocks	Assistant
29-Sep	10	L4-S1 bilateral decompression with L4/5 right TLIF, L5/S1 PLIF	L4/5, L/S1 spinal stenosis with disc degeneraton and L4/5 spondylolisthesis	Surgeon 2
2-Oct	11	L2/3 right decompression with over-the-top contralateral decompression	L2/3 stenosis with ligamentum flavum hypertrophy	Assistant
5-Oct	12	L2/3 right microdisectomy	L2/3 lateral subluxation with right prolapsed intervertebral disc	Assistant
5-Oct	13	L4/5 bilateral decompression, drainage of abscess and L4/5 PLIF	L4/5 spondylodisciitis with psoas abscess and subacute anterior epidural abscess	Surgeon 2
5-Oct	14	S1 screw removal and extension of instrumentation to S2AI	L5/S1 pseudoarthrosis with S1 screws loosening	Surgeon 2
6-Oct	15	L3/4, L4/5 bilateral decompression with L3/4, L4/5 left TLIF and instrumentation L2-L5	L2-L5 severe disc degeneration, flat back, L3/4, L4/5 spinal stenosis and near ankylosed L2/3	Surgeon 2
9-Oct	16	L4/5 left decompression with over-the-top contralateral decompression, L3/4 right decompression with over-the-top contralateral decompression	L3/4, L4/5 spinal stenosis with mild L3/4 spondylolisthesis	Assistant
9-Oct	17	L4/5 bilateral decompression and L4/5 right TLIF with L5/S1 decompression	L4-S1 spinal stenosis with L4/5 spondylolisthesis	Surgeon 2
9-Oct	18	T9 bilateral transpedicular kyphoplasty	T9 adjacent level compression fracture s/p previous T10 kyphoplasty	Observer
10-Oct	19	L4/5 right microdiscectomy (Wiltse approach)	L4/5 right prolapsed intervertebral disc (far lateral)	Assistant
10-Oct	20	L3/4 and L4/5 left decompression with insertion of dyanamic stabilizer L4/5	L4/5 adjacent level instability s/p previous L5/S1 TLIF and spinal stenosis left L3/4, L4/5	Assistant

10-Oct	21	L4/5 left decompression with over-the-top contralateral decompression, L2/3 and L3/4 right decompression with over-the-top contralateral decompression	L3-5 spinal stenosis with scoliosis	Surgeon 2
12-Oct	22	L3/4 left decompression with over-the-top contralateral decompression	L3/4 spinal stenosis	Assistant
12-Oct	23	L4/5 right decompression with over-the-top contralateral decompression	L4/5 spinal stenosis	Assistant
12-Oct	24	L5/S1 left microdiscectomy	L5/S1 left prolapsed intervertebral disc	Assistant
12-Oct	25	L5/S1 right microdiscectomy and L4/5 right decompression with over-the-top contralateral decompression	L5/S1 right prolapsed intervertebral disc with L4/5 spinal stenosis	Assistant
13-Oct	26	L4/5 left microdiscectomy	L4/5 left prolapsed intervertebral disc with inferior migration	Assistant
13-Oct	27	C4/5, C6/7 artificial disc replacement	C4/5 and C6/7 cervical prolapsed intervertebral disc with myelopathy	Assistant
13-Oct	28	L2/3, L3/4, L4/5 right decompression with over-the-top contralateral decompression	L2/3, L3/4, L4/5 spinal stenosis	Assistant