

APSS-MEDTRONIC SPINE FELLOWSHIP REPORT 2017

Duration of fellowship: 3rd May to 2 nd August 2018

Fellow

Dr Naing Lin Oo

M.B.B.S(Ygn),M.Med.Sc(Ortho),MRCS(Edin)

Consultant Orthopaedic Surgeon

Host spine centre:

Department of Orthopaedic surgery,

National University Hospital, Singapore.



Mentor: A/Prof Gabriel Liu

Head, Dept. Of Spine Surgery division (Deformity correction & degenerative spine)



Division of Spine Surgery, University Spine Centre
Department of Orthopaedic Surgery, UOHC
APSS-NUH Spine Fellowship 2018



Front Row (Left to Right): Dr Dennis Hey, A/Prof Naresh Kumar, Prof Wong Hee Kit, A/Prof Gabriel Liu, Dr Lau Leok Lim
Back Row (Left to Right): Dr Joel Tan Yong Hao, Dr Lin Shuxun, Dr Kimberly-Anne Tan, Dr John Ruiz, Dr Naing Lin Oo, Dr Kutbuddin Akbary, Dr Shardul Soman, Dr Jeremy Goh

Department faculty

Prof Wong Hee Kit

Prof Naresh Kumar

Prof Joseph Thambiah

Dr Lau Leok Lim

Dr Dennis Hey

Dr John Ruiz

Introduction

First of all, I would like to thank Asia Pacific Spine Society (APSS) for selecting me to attend this fellowship in National University Hospital Singapore (NUH) from 3rd May 2018 – 2nd August 2018. This is quite a good opportunity to interact and observe in a spine center like NUH.

The APSS arranged all the airline ticket, accommodation. I arrived in Singapore on 1st May 2018 and passed the Singapore Medical Council for temporary medical registration and Singapore Medical Association for medical protection on 2nd May 2018 and passed the Ministry of Man Power for temporary employment pass on 3rd May 2018, all guided by Human Resource Department (NUH) and joined the activity in the evening of 3rd May 2018 with Dr Dennis Hey team. I stayed in Fragrance Hotel (waterfront) located on 418 Pasir Panjang Road, Singapore 118759. The hotel was good, a lot of restaurant and mini market around the hotel.

In the early morning of 4th May 2018, I went to join with Dr Dennis Hey team for daily morning ward round and after finishing ward round, I joined the OT with Dr Dennis Hey team to assist his operations. I followed my OT schedule. I was honoured to present a short personal introduction and about my hospital on the spine rounds on Thursday. The meeting was attended by Prof Hee Kit Wong, Prof Gabriel Liu, Prof Naresh Kumar and other members in the spine unit and discussed actively about pre op and post operative case management. I had to present the pre op cases for discussion and also presented the updated journals in journal club of Thursday spine round. During my stay here, I attended morning resident lecture and meeting held by the department such as management of spine trauma, management of adult degenerative scoliosis etc., and also I attended basic spine course in NUH hold on 26.5.2018. I also got clinical knowledge teaching by A/Prof Gabriel Liu, Prof Wong Hee Kit, Dr Dennis Hey and Dr Lau Leok Lin in clinic days.

My fellowship schedule in NUH

Mond	OT3 (Prof HK Wong)	OT3 (A/Prof Gabriel Liu)
Tuesday	OT3 (Prof HK Wong)	OT3 (Prof H K Wong)
Wednesday	OT3 (A/Prof Thambiah)	OT2 (A/Prof Gabriel Liu)
Thursday	Spine round OT3(Dr Lau Leok Lim) Or OR3(A/Prof Naresh)	OT3 (Dr Lau Leok Lim) Or OR3 (A/Prof Naresh)
Friday	KRWOR6 (Dr Lau Leok Lim) or KRWOR6 (Dr Dennis Hey)	KRWOR6 (Dr Lau Leok Lim) or KRWOR6 (Dr Dennis Hey)

Daily Rounds

3 May-31 May- Dr Dennis Hey

1 June-30 June- Dr Lau Leok Lim

1 July-2 Aug- A/Prof Gabriel Liu

Monday Clinic with Dr Dennis Hey team for 3 weeks(from 14 May to 1 June 2018)

Monday Clinic with Dr Lau Leok Lim team for 3 weeks (from 4 June to 22 June 2018)

Friday Clinic with Prof Wong Hee Kit Team for 3 weeks (from 25 June to 13 July 2018)

Friday Clinic with A/Prof Gabriel Liu Team for 3 weeks (from 16 July to 2 August 2018)

Logbook of spine surgeries observed and assisted in NUH (from 3rd May 2018 to 2nd August)

Sr No	Date	Age/Sex	Diagnosis	Procedure	Surgeon	Role	Remark
1	4.5.2018	57/M	Spondylolisthesis L5-S1 Grade II	Open TLIF L5-S1	Dr Dennis Hey	Assisted	
2	4.5.2018	71/M	Degenerative scoliosis with spinal stenosis L3-4 and L5-S1	OLIF+Posterolateral fusion L3-4 and L4-5	Dr Dennis Hey	Assisted	Mini open OLIF technique
3	4.5.2018	52/M	Foraminal stenosis L4-5(Lt)	L4 foraminal block (Lt)	Dr Dennis Hey	Assisted	
4	7.5.2018	73/M	Spinal stenosis L3-4 and L4-5	MIS TLIF L3-4 and L4-5	Prof Wong HK	Observed	Insertion of percutaneous pedicle screw
5	8.5.2018	64/M	Degenerative scoliosis with spinal stenosis L1-2,L2-3,L3-4	Deformity correction with posterior fixation and fusion T9 to S1, Cage with bone graft and BMP L1-2,L2-3,L3-4 and L4-5	Prof Wong HK	Observed	Role of multilevel TLIF in deformity correction
6	9.5.2018	62/M	Degenerative scoliosis with spinal stenosis L3-4,L4-5	XLIF L3-4,L4-5 , Decompression and posterolateral fusion L3 to L5	A/Prof Gabriel Liu	Assisted	XLIF technique, anterior posterior combined

7	9.5.2018	69/M	Cervical myelopathy C3-4,C4-5,C5-6	ACDF with cage and plating	A/Prof Gabriel liu	Assisted	
8	11.5.2018	57/F	Spinal stenosis L4-5,L5-S1	Open TLIF L4-5,L5-S1	Prof Wong HK	Observed	
9	11.5.2018	33/F	Extraforaminal disc herniation L5-S1(Lt)	Microdiscectomy L5- S1(Lt)	Dr Dennis Hey	Assisted	very rare case
10	11.5.2018	70/F	Opted Degenerative scoliosis with bilateral SIJ pain	Bilateral SIJ injection	Dr Dennis Hey	Observed	
11	11.5.2018	49/F	Foraminal stenosis L4-5(Rt)	Foramina block L4- 5(Rt)	Dr Dennis Hey	Observed	
12	14.5.2018	78/M	Spondylolisthesis L4-5 Grade(II)	Open TLIF L4-5	Prof Wong HK	Observed	
13	14.5.2018	65/M	Spondylolisthesis L4-5 Grade(II), Lateral recess stenosis L5-S1	Open TLIF L4-5,L5-S1	Prof Wong HK	Observed	
14	15.5.2018	62/F	Spondylolisthesis L4-5 Grade(II)	Open TLIF L4-5	Dr Dennis Hey	Assisted	
15	15.5.2018	60/M	Cervical myelopathy C3-4,C4-5,C5-6	ACDF C3-6 with cage and plating	Dr Dennis Hey	Assisted	
16	15.5.2018	44/F	Discogenic pain L3-4,L4-5	Discogram L3-4,L4-5	Dr Dennis Hey	Observed	
17	16.5.2018	70/F	Opted TLIF L3-4 with sagittal imblance	Anterior discectomy and fusion T11-12, XLIF T12-L1,L1-2,L2- 3 and OLIF L5-S1	A/Prof Gabriel Liu	Assisted	
18	17.5.2018	14/F	Adolescent Scoliosis Lenke 2	Posterior spinal instrumentation and fusion T4-L3	Dr Lau Leok Lim	Assisted	
19	18.5.2018	28/F	Spondylolisthesis	Open TLIF L5-S1	Dr Dennis	Assisted	

			L5-S1 Grade(I)		Hey		
20	18.5.2018	67/M	Spinal stenosis L4-5 (Rt)	Laminotomy L4-5 (Lt)	Dr Dennis Hey	Assisted	
21	18.5.2018	43/F	Cervical myelopathy C3-6	ADR C3-4,C4-5 and Stand alone cage C5-6	Dr Dennis Hey	Assisted	Motion preserving surgery
22	21.5.2018	68/F	Opted pathological fracture T6 with SSI	WD	Dr Dennis Hey	Assisted	
23	21.5.2018	70/F	Opted TLIF L3-4 with Sagittal imbalance	MIS Posterior instrumentation and fusion T11-S1 and Iliac screw fixation	A/Prof Gabriel liu	Assisted	
24	22.5.2018	16/F	Adolescent scoliosis Lenke 2	Posterior spinal instrumentation and fusion T4-12	Prof Wong HK	Observed	
25	22.5.2018	35/M	PID L4-5,L5-S1(Rt)	Microdiscectomy L4-5,L5-S1(Rt)	Dr Dennis Hey	Assisted	
26	23.5.2018	58/M	PID L4-5(Lt),L5-S1(Rt)	Microdiscectomy L4-5(Lt),L5-S1(Rt)	A/Prof Gabriel Liu	Assisted	
27	23.5.2018	16/F	Idiopathic scoliosis Lenke Type 6C	Selective fusion T11-L4	A/Prof Gabriel Liu	Assisted	Rod derotation technique
28	23.5.2018	75/F	Acute on chronic L2 burst fracture with cauda equine syndrome	Anterior corpectomy L2 ,Mesh , Posterior decompression and fixation	Dr Dennis Hey	Observed	
29	24.5.2018	47/F	PID L5-S1(Rt)	Radioferquency ablation L5-S1(Rt)	A/Prof Naresh kumar	Observed	
30	24.5.2018	49/M	Foraminal stenosis C5-6(Rt)	C6 nerve block	A/Prof Naresh Kumar	Observed	
31	24.5.2018	52/M	Foraminal stenosis C 6-7	C7 nerve block	A/Prof Naresh Kumar	Observed	

32	25.5.2018	65/F	Opted TLIF L4-5 with thoracic kyphosis	Multiple Ponte osteomies and posterior instrumentation and fusion T3-L1	A/Prof Naresh Kumar	Assisted	
33	27.5.2018	58/F	Ca breast with secondary metastasis to C6-7 T1-2 with C6-7 T1 radiculopathy	C6-7 T1-2 anterior corpectomy, expandable cage with allograft, Plating and Posterior instrumentation and fusion C4-7 and MIS T3-5	A/Prof Gabriel Liu	Assisted	Multilevel anterior corpectomy
34	28.5.2018	14/F	Adolescent idiopathic scoliosis Lenke 5	Anterior Selective fusion T10-L3 using thoracoscope	Prof Wong HK	Observed	Selective fusion
35	30.5.2018	67/M	Cervical myelopathy C4-6 and multilevel lumbar spinal stenosis L1-S1	Cervical laminoplasty C4-C6 and microscopic bilateral laminotomy L1-S1	A/Prof Gabriel Liu	Assisted	
36	30.5.2018	47/M	PID L5-S1 (Rt)	Microdiscectomy L5-S1(Rt)	A/Prof Gabriel Liu	Observed	
37	31.5.2018	10/M	Hemivertebra T12	Excision and Posterior fixation and fusion	Dr Lua Leok Lim	Observed	
38	31.5.2018	52/M	PID L4-5(Lt)	Microdiscectomy L4-5(Lt)	Prof Wong HK	Observed	
39	31.5.2018	72/F	T12 pathological fracture with paraparesis	Posterior corpectomy T12,decompression, Mesh and bone graft with posterior fixation and biopsy	Dr Dennis Hey	Assisted	
40	1.6.2018	45/M	PID L4-5(Lt)	Microdiscectomy L4-5(Lt)	Dr Dennis Hey	Assisted	
41	1.6.2018	58/F	Cervical myelopathy C4-5 C5-6	ACDF C4-6 with cages and platng	Dr Dennis Hey	Assisted	
42	4.6.2018	46/M	PID L4-5 (Rt)	Microdiscectomy L4-5(Rt)	A/Prof Gabriel Liu	Assisted	

43	5.6.2018	18/F	Idiopaethic scoliosis Lenke 2	Posterior spinal and instrumentation fusion T2-L2	Prof Wong HK	Observed	
44	5.6.2018	43/M	PID L5-S1(Lt)	Microdiscectomy L5-S1(Lt)	Prof Wong HK	Assisted	
45	6.6.2018	48/M	Spondylolisthesis L4-5 Grade II and Spinal stenosis L5-S1	TLIF L4-5 L5-S1	A/Prof Gabriel Liu	Assisted	
46	6.6.2018	38/M	Epidural abscess with multilevel lumbar spinal stenosis T12-L5	Laminectomy T12-L5 with decompression , biopsy and C&S	A/Prof Thambiah	Assisted	
47	7.6.2018	52/M	Cervical spine injury with central cord syndrome	Cervical laminoplasty C3-5	A/Prof Thambiah	Assisted	Open door laminoplasty
48	8.6.2018	45/F	Cervical myelopathy C3-6	Cervical laminoplasty C3-6	A/Prof Naresh Kumar	Assisted	
49	11.6.2018	24/F	Idiopathic scoliosis Lenke 2	Posterior spinal and instrumentation fusion T4-L3	Prof Wong HK	Assisted	
50	11.6.2018	64/F	Secondary metastasis to T10 with paraparesis	Posterior T10 corpectomy with posterior fixation and fusion and biopsy	A/Prof Gabriel Liu	Assisted	
51	12.6.2018	14/F	Idiopathic scoliosis Lenke 2	Anterior spinal and instrumentation fusion T11-L3	Prof Wong HK	Observed	
52	12.6.2018	56/M	Spondylolisthesis L5-S1 Grade II	Open TLIF L5-S1	Prof Wong HK	Observed	
53	13.6.2018	60/F	T11-12 compress fracture with OYL and paraparesis	Posterior decompression T11-12 and Transforainal interbody fusion and fixation T9-10 L1-2	A/Prof Gabriel Liu	Assisted	
54	14.6.2018	67/M	T2-3 OYL and Spondylolisthesis L4-5 with	Posterior decompression T2-3 and fixation and fusion	A/Prof Naresh Kumar	Assisted	

			paraparesis	MIS TLIF L4-5			
55	18.6.2018	38/F	Foraminal stenosis L3-4(Rt)	L3 nerve block (Rt)	A/Prof Gabriel Liu	Observed	
56	18.6.2018	45/F	PID L4-5 (Rt)	Microdiscectomy L4-5 (Rt)	A/Prof Gabriel Liu	Assisted	
57	19.6.2018	16/M	Idiopathic Scoliosis Lenke 2	Posterior spinal instrumentation and Fusion T4-L3	Prof Wong HK	Assisted	
58	19.6.2018	45/F	PID L5-S1 (Rt)	Microdiscectomy L5-S1(Rt)	Prof Wong HK	Observed	
59	20.6.2018	61/M	Spinal stenosis L3-4, L4-5 L5-S1 and facet cyst L3-4 (Lt)	Decompression, cyst excision, Posterolateral fusion L3-4,TLIF L4-5,L5-S1	A/Prof Thambiah	Assisted	
60	21.6.2018	45/M	Cervical myelopathy C3-4	ACDF with Stand alone cage C3-4	A/Prof Naresh Kumar	Assisted	
61	21.6.2018	16/F	Idiopathic scoliosis Lenke 5	Thoracoscopic anterior instrumentation and fusion T5-12	Prof Wong HK	Observed	
62	22.6.2018	38/M	PID C5-6 with radiculopathy C6	ADR C5-6	Prof Naresh Kumar	Assisted	
63	23.6.2018	32/F	T7-8 osteomyelitis with epidural abscess	Posterior decompression and Fixation T5-6 T9-10, Biopsy and C&S	Dr Lau Leou Lim	Assisted	
64	25.6.2018	14/F	Idiopaethic scoliosis Lenke 4	Posterior instrumentation and Fusion T2-L3	Prof Wong HK	Assisted	
65	25.6.2018	54/F	Spondylolisthesis L4-5 Grade II	Open TLIF L4-5	A/Prof Gabriel Liu	Assisted	
66	26.6.2018	16/F	Idiopathic scoliosis Lenke 5	Anterior spinal instrumentation and fusion T11-L3	Prof Wong HK	Observed	

67	26.6.2018	60/M	Spondylolisthesis L3-4 L4-5	Open TLIF L3-4 L4-5	Prof Wong HK	Assisted	
68	27.6.2018	46/F	Cervical myelopathy C4-6	ACDF with cages and Plating	A/Prof Gabriel Liu	Assisted	
69	27.6.2018	56/M	Cervical myelopathy C4-6	Anterior corpectomy C5 and Mesh,bone graft and Plating	A/Prof Gabriel Liu	Assisted	
70	27.6.2018	53/M	PID L4-5(Rt)	Micridisectomy L4-5(Rt)	A/Prof Gabriel Liu	Assisted	
71	28.6.2018	56/F	Spinal stenosis L3-4, Extraforaminal stenosis L4-5 (Lt)	Posterior bilateral laminotomy and interspinous spacer L3-4 Microscopic decompression L4-5(Lt)	A/Prof Naresh Kumar	Assisted	
72	29.6.2018	61/F	Spinal stenosis L2-3, L3-4 and L4-5	Open PLIF L2-3,TLIF L3-5	A/Prof Naresh Kumar	Assisted	
73	2.7.2018	76/M	Cervical myelopathy3C3-6	C3 and C6 laminectomy, laminoplasty C4	Prof Wong HK	Assisted	
74	2.7.2018	42/M	PID L5-S1(Rt)	Microdisectomy L5-S1(Rt)	A/Prof Gabriel Liu	Assisted	
75	3.7.2018	10/M	Congenital scoliosis due to hemivertebra T7-8	Anterior thoracoscopic Pedicle subtraction osteotomy T8,anterior discectomy and fusion T6-7,T7-8,T8-9 followed by posterior decompression T7-8, instrumentation and fusion (T6-T9)	Prof Wong HK	Assisted	Thoracoscopic surgery
76	4.7.2018	68/F	Secondary metastasis to C 6,	Anterior corpectomy C6 mash and allograft and plating followed by posterior	A/Prof Gabriel	Assisted	

			T1 and T3	Cervicothoracic fusion (C3-4-5-7,T2,4,5)	lua		
77	5.7.2018	54/F	Spinal stenosis L4-5	Posterior decompression and interspinous spacer device fixation (L4-5)	A/Prof Naresh Kumar	Observed	
78	5.7.2018	62/F	Spinal stenosis L4-5	Laminotomy and microscopic decompression (L4-5)	A/Prof Naresh Kumar	Observed	
79	6.7.2018	63/M	Spondylolisthesis L4-5 Grade I and spinal stenosis L3-4	MIS TLIF L3-4,L4-5 with banana cage with DBM	Dr Dennis Hey	Assisted	
80	9.7.2018	57/M	Spondylolisthesis L4-5 and Spinal stenosis L5-S1	Open TLIF L4-5,L5-S1	Prof Wong HK	Assisted	
81	9.7.2018	48/F	Central and lateral recess stenosis L4-5	XLIF L4-5 followed by tubular decompression and MIS screw fixation L4-5	A/Prof Gabriel liu	Assisted	One level anterior poerior combined
82	10.7.2018	50/M	Opted posterolateral fusion L4-5,L5-S1 with implant loosening and ASD L3-4	Implant revision and TLIF L3-4,L4-5	Prof Wong HK	Assisted	
83	10.7.2018	50/M	Opted posterolateral fusion L4-5,L5-S1 with implant loosening and ASD L3-4	Implant revision and TLIF L3-4,L4-5	Prof Wong HK	Assisted	

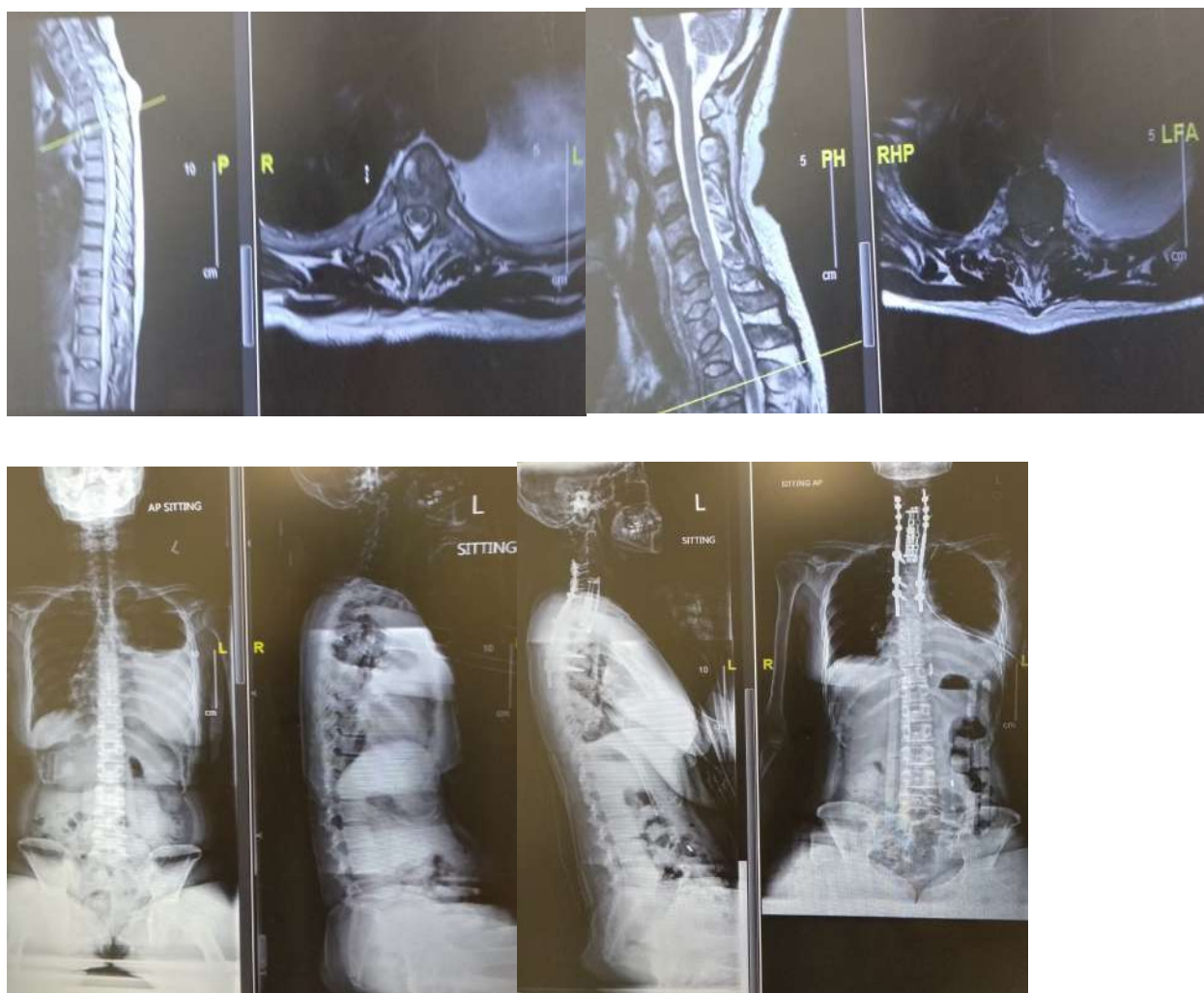
84	11.7.2018	72/M	Degenerative scoliosis with multilevel spinal stenosis underlying DISH	Posterior decompression and instrumentation followed by OLIF L2-3,L3-4 L4-5 and ALIF L5-S1 followed by Posterior fusion and deformity correction (T9 to S1, iliac screw)	Dr Dennis Hey	Assisted	Iliac screw insertion technique
85	12.7.2018	45/F	lateral recess stenosis L3-4,L4-5(Lt)	Microscopic laminotomy and decompression L3-4,L4-5(Lt)	Prof Wong HK	Assisted	
86	13.7.2018	74/F	Opted TLIF L3-4,L4-5 with flat back syndrome	Posterior rod removal followed by OLIF L2-3,L3-4,L4-5 and ALIF L5-S1 followed by decompression screw revision, deformity correction,posterior instrumentation and fusion(T9 to S1, iliac screw)	Dr Dennis Hey	Assisted	
87	16.7.2018	16/F	Idiopathic scoliosis Lenke 1C	Thoracoscopic anterior fusion and instrumentation(T5-T11)	Prof Wong HK	Assisted	
88	18.7.2018	38/M	L1burst fracture with incomplete neurological deficit,ASIA-C	Decompression and long posterior fixation	Dr Dennis Hey	Assisted	

89	19.7.2018	14/M	Neuromuscular scoliosis Lenke 6C	Posterior instrumentation and fusion	Dr Lau leok lim	Assisted	
90	23.7.2018	54/F	Spondylolisthesis Grade II	Open TLIF L4-5	Prof Wong HK	Assisted	
91	23.7.2018	49/F	Cervical spondylotic myelopathy C3-4,4-5,5-6 and 6-7	ADR C3-4,C4-5 and ACDF C5-6,C6-7 with allograft cage with plating	Prof Gabriel Liu	Assisted	
92	24.7.2018	68/M	Spinal stenosis L2-3,L3-4 and L5-S1	TLIF S1,Laminectomy Bilateral Lamin L2-3	Dr Dennis Hey	Assisted	
93	25.7.2018	46/F	Cervical radiculopathy C6-7	ADR C6-7	A/Prof Gabriel Liu	Assisted	
94	25.7.2018	56/M	Spondylolisthesis L4-5 Grade I	Robotic assisted MIS TLIF L4-5	A/Prof Thambiah	Observed	Mazer robotic system
95	30.7.2018	58/M	Spondylolisthesis L5-S1 Grade II	Open TLIF L5-S1	A/Prof Gabriel Liu	Assisted	

Operated case examples

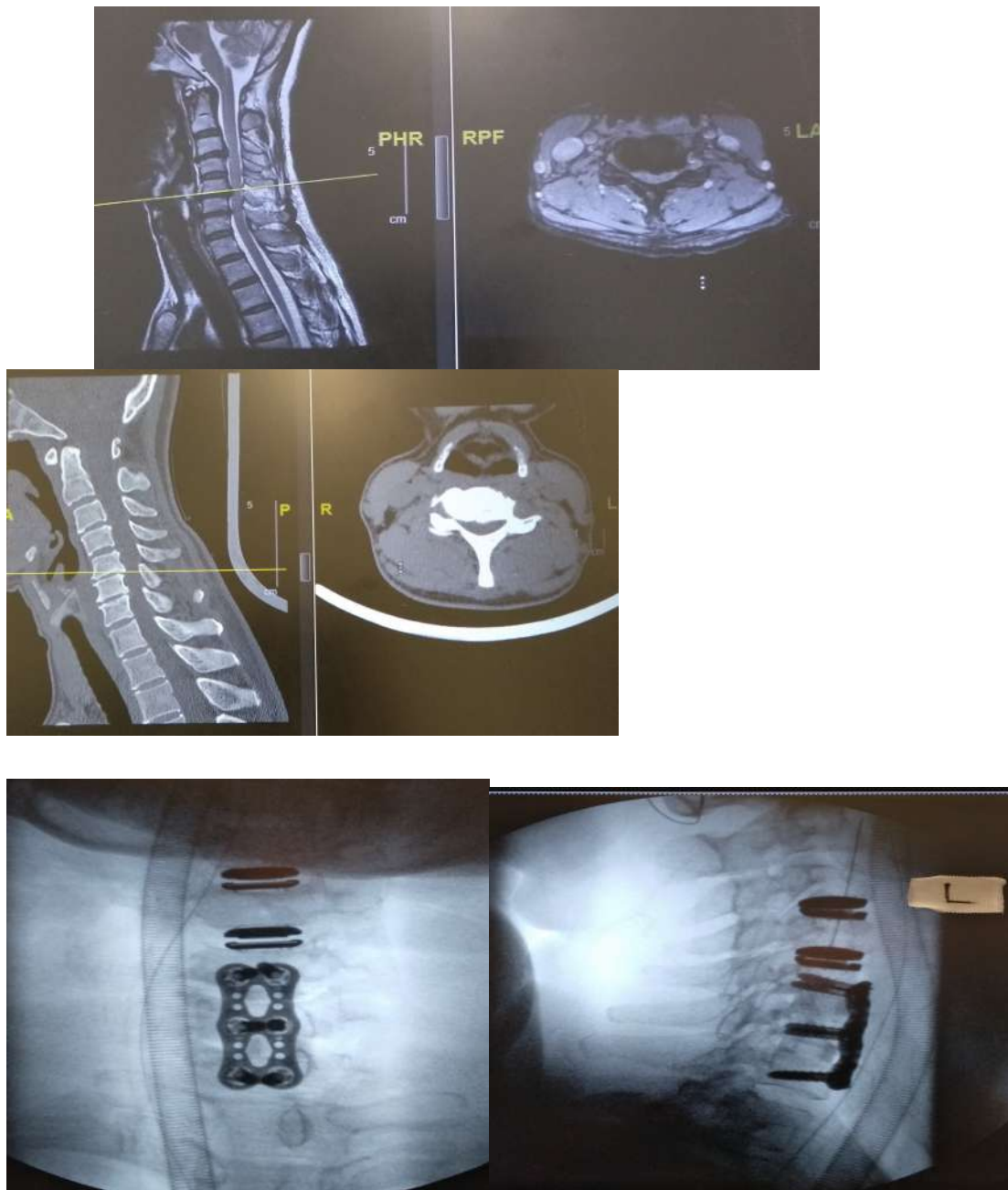
Case 1

A 58-year-old female presented with neck pain for 6 months (VAS-9), both arm pain (VAS-6/10) and numbness for 3 months diagnosed at multiple spine and visceral metastasis due to a primary breast carcinoma. The patient presented with early myelopathy due to a pathological collapse of the C6-7 and T1-2 vertebra. MRI and CT showed C6,7,T1,2 collapsed with mild cord compression. JOA score was 13. SINS score was 11. Tomita classification was type 6. The patient was treated with anterior corpectomy C6-7,T1-2, expandable cage with allograft and plating followed by a hybrid fixation of MIS screw fixation in thoracic spine 3,4 and 5 and open lateral mass screw fixation C 4,5,6 and 7.



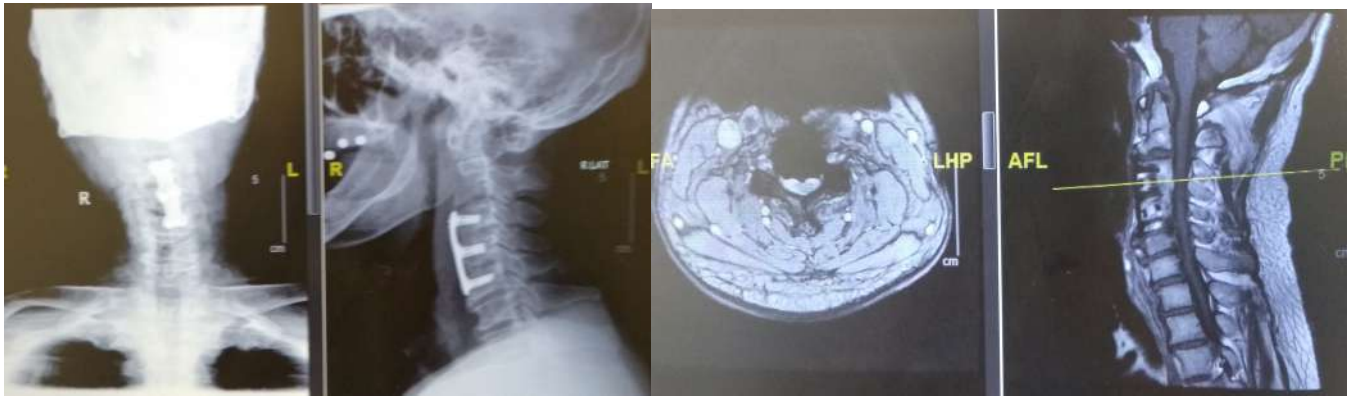
Case 2

49 years old, female presented with Rt arm pain (VAS-8/10) and numbness of Rt upper and lower limb for 6 months, writing and using chopstick ok, can walk without support, urinary and bowel normal, JOA-12. The patient was planned for artificial disc replacement C3-4 and C4-5, ACDF C5-6, C6-7 with allograft cages and variable angle plate and screws were done.



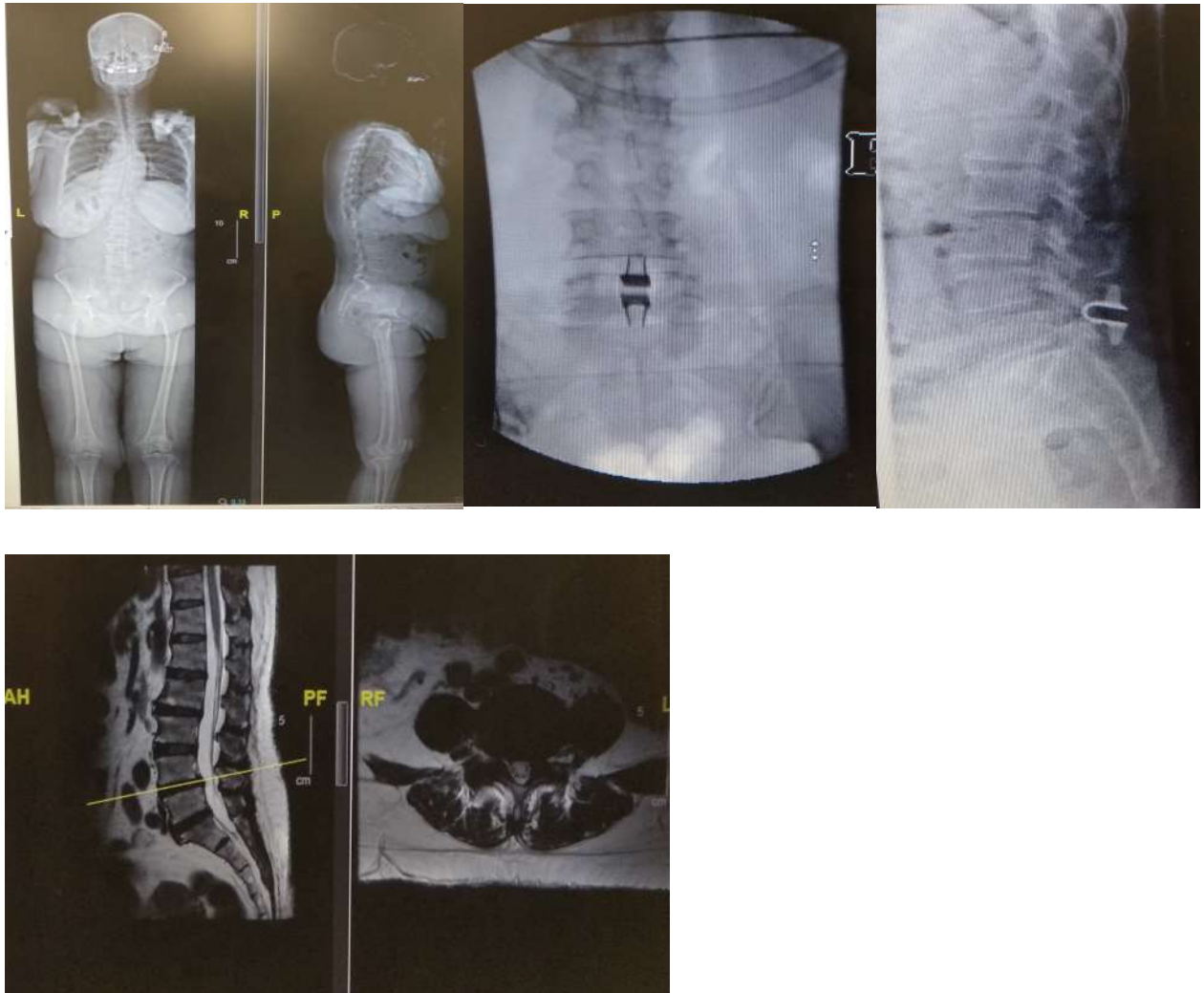
Case-3

A 67 years old gentleman presented with numbness of both hand and foot for 1 year duration, writing and using chopstick not ok, can walk without support, JOA-10, associated with back pain and both legs pain (legs pain more severe than back pain), previously operated ACDF C3-4 and C4-5 for cervical myelopathy last 10 years ago. The patient was planned for partial laminectomy C3 and Laminoplasty C4-5,C5-6 and C6-7 , internal fixation of spine with arch plate C4-6 were done and posterior bilateral laminotomy decompression L1-2,L2-3,L3-4,L4-5 and L5-S1 using microscope.



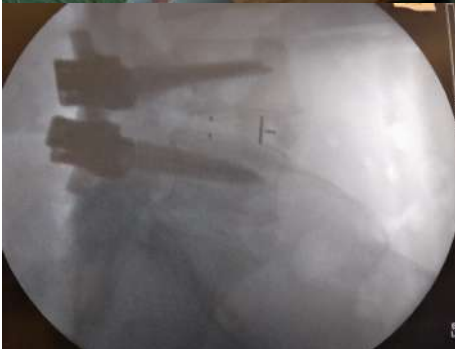
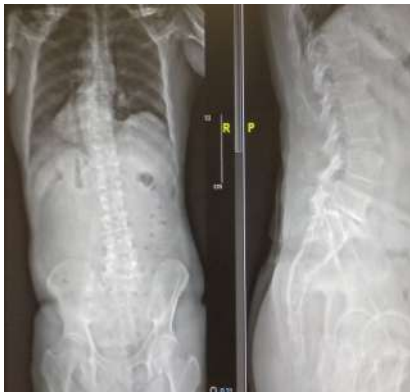
Case 4

54 year old lady presented with Rt neurogenic claudication for one year, VAS-8/10 for both leg pain (Rt > Lt), no back pain, X ray showing without instability, MRI showed central and lateral recess stenosis L4-5 (both). Diagnosis was central and lateral recess stenosis L4-5 (both). The patient was planned for microscopic decompression L4-5 (both) and interspinous spacer insertion.



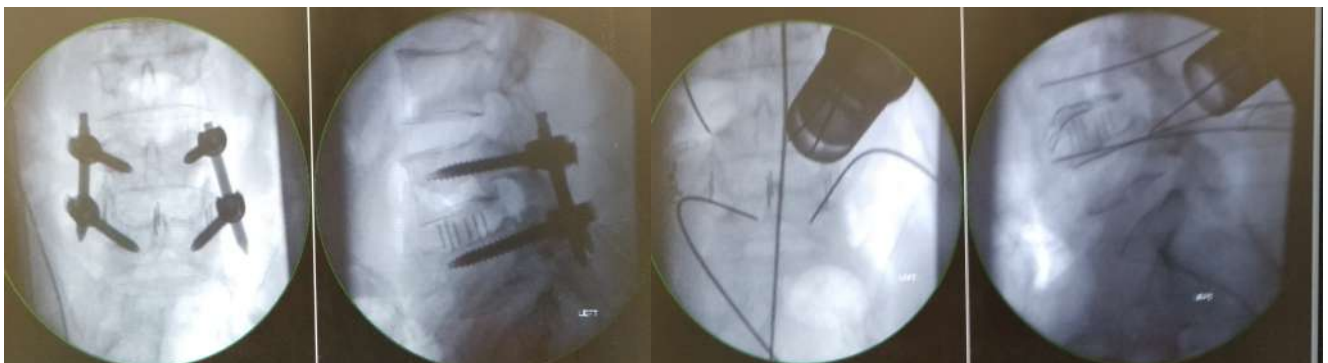
Case 5

A 56 year old gentleman presented with LBP and Rt neurogenic claudication for one year, back pain more severe than leg pain, VAS-8/10 for back pain and 6/10 for both leg pain (Lt>Rt), diagnosis was Spondylolisthesis L4-5 Grade I with lateral recess stenosis. The patient was planned for MIS TLIF L4-5 using a robotic guidance assisted surgery. A preoperative CT scan was performed and the data was fed into the Mazer robotic system. Pedicle screws were placed using the robotic guidance system. Microscopic decompression and TLIF cage with BMP and bone graft insertion were done. This was a novel experience as it was a first hand experience with the robotic surgery.



Case 6

A 48 year old lady presented with LBP for 3 year and bilateral neurogenic claudication (Lt>Rt) for 6 months, back pain more severe than leg pain, VAS-9/10 for back pain and VAS- 6/10 for both leg pain (Lt>Rt), diagnosis was spondylolisthesis grade I and central and lateral recess stenosis. The patient was planed for XLIF L4-5 followed by posterior MIS percutaneous screw fixation L4-5 and tubular decompression through Lt side in same position.



Case-7

A 74 year-old lady presented with LBP and Lt neurogenic claudication for one year, VAS-8/10 for back pain and VAS- 7/10 for leg pain, previously open TLIF L3-4 and L4-5 operated for spondylolisthesis L3-4 and L4-5 last 7 year ago. X-ray showed degenerative scoliosis. MRI showed spinal stenosis L2-3,L3-4 and L4-5. Diagnosis was multilevel spinal stenosis associated with degenerative scoliosis with implant loosening. The patient was operated for posterior rod removal followed by anterior cage removal L3-4,L4-5 and OLIF L2-3,L3-4,L4-5 and ALIF L5-S1 followed by posterior screw revision, posterior instrumentation T9-S1 and iliac screw fixation and decompression L2-3,L3-4,L4-5 and posterior facet fusion.



Case-8

A 70 year old lady presented with LBP for two years, severe back pain for 3 month, VAS-9/10, both leg pain for 3 months, VAS-5/10(Lt>Rt), previously operated TLIF L3-4 last 10 year ago. X-ray showed sagittal imbalance. MRI show mild lateral recess stenosis L1-2,L2-3,L4-5 and L5-S1 (both). The patient was planned for first stage anterior discectomy and fusion T11-12, XLIF T12-L1,L1-2,L2-3, and OLIF L5-S1 and five day later second stage MIS percutaneous screw posterior instrumentation T11-S1 and iliac screw fixation and fusion.



Case 9

A 10 year old boy presented with scoliosis due to congenital hemivertebra T7-8 without neurological deficit. Codd's angle was 45 degree. The patient was planned for thoracoscopic assisted pedicle subtraction osteotomy T8 and anterior discectomy and fusion T6-7, T7-8 and T8-9 followed by Posterior laminectomy and decompression T7-8 and posterior instrumentation and facet fusion T6-T9.



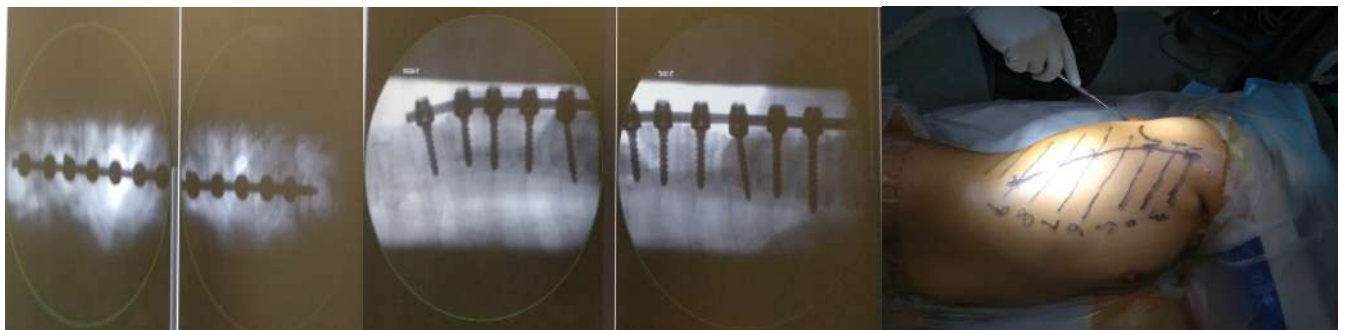
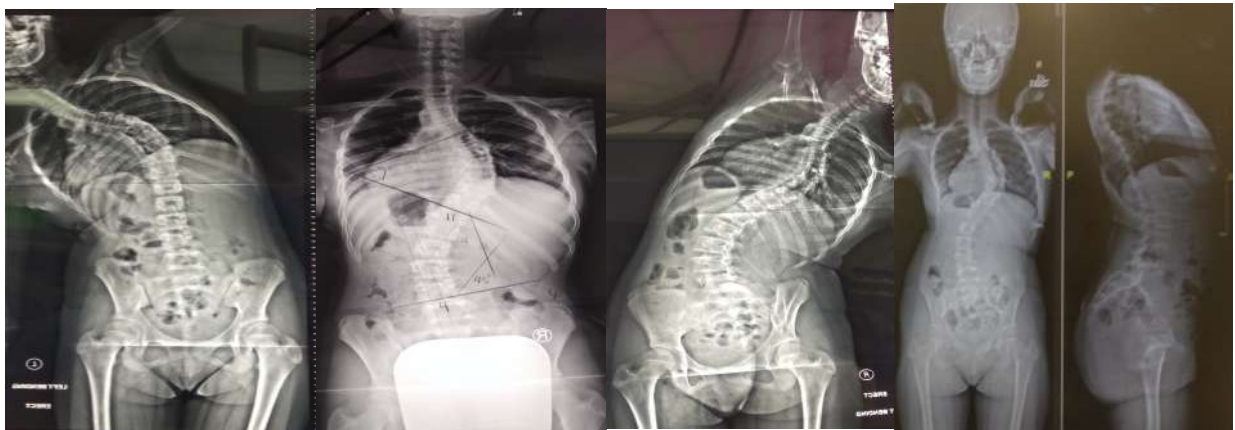
Case 10

A 13 year old female presented with back pain (VAS-6/10) idiopathic scoliosis Lenke Type 6C without neurological deficit. MRI the whole spine showed no cord abnormality. EOS xray showed scoliosis, T4-T10 cobb's angle was 34.5 degree, T10-L3 cobb's angle was 57.7 degree. Risser 2,SVA-2 cm, PI-68.7 degree, LL 62 degree,TK-15 degree. The patient was planned to selective posterior instrumentation and fusion T11 to L4 and deformity correction using rod derotation technique.



Case 11

A 16-year-old girl presented with an adolescent idiopathic scoliosis Lenke !C. The patient was treated with a video assisted thoracoscopic anterior approach deformity correction and selective anterior fusion (T5-T11). The technique of port placement was discussed with pearls and pitfalls. A right sided approach was taken and end vertebra to end vertebra fixation was planned. Four ports are needed for screw placement and an additional anterior port to retract the underlying lung tissue. Anterior discectomy and fusion with rib graft was performed. Screws were inserted and rod connected to correct the deformity.



Conclusion

A period of 3 months was too short to learn from Professor Gabriel liu. It was really fruitful to observe unique techniques of different spine surgeons in National University Hospital Singapore. I learnt not only the techniques but also the up-to-date principles in treating adult spine deformity, the advanced modifications in MIS surgery and, most important, the attitude of being a spine surgeon. I passed the valuable times for APSS spine fellowship training staying in NUH. I am honour to be APSS spine clinical fellow in NUH.

Acknowledgement

I would like to thank Ms Siew Yian Tan and Ms Chua Li Ping at medical affairs and the department of Orthopedic for their help with my fellowship application and with local procedural formalities and also thank Ms Jenny (APSS secretary) and APSS authorized person. My mentor A/Prof Gabriel Liu taught me a lot about MIS spine surgery and deformity correction. So, at last, I would like to say thank a lot not only A/Prof Gabriel Liu but also all of spine surgeons from NUH.

Time in Singapore

Prof Wong and A/Prof Liu were kind enough to host a farewell dinner with the very popular Sea food restaurant Jumbo Seafood. I enjoyed a lot of the local cuisine sampling Japanese, Korean and Chinese delicacies. I went sight seeing to famous places in Singapore and shopping malls in weekend days.

Photos gallery staying in NUH

Thursday morning spine round



A/Prof Gabriel Liu teaching



Special teaching in lunch time by A/Prof Gabriel Liu



Personal introduction to NUH Spine Team



Prof Wong Hee Kit's spine tumor discussion



Attending 2018 basic spine course in NUH (26.5.2018)



Attending resident teaching in NUH



Assisted in OT case



Farewell dinner in Jumbo



With Future Adult deformity surgeon Dr Dennis Hey



Treating Time

