

# APSS Clinical Spine Fellowship Report- 2015

## Fellow

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MS, DNB

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## Guides

Prof. Kenneth M.C. Cheung

Professor and Head

Dept. Of Orthopaedics and Traumatology

Queen Mary Hospital

University of Hongkong

Prof. Yat Wa Wong

Chief of Spine Division

Dept. Of Orthopaedics and Traumatology

Queen Mary Hospital

University of Hongkong

## Centers visited

**Queen Mary Hospital**

University of Hongkong

Pokfulam Road, Hongkong

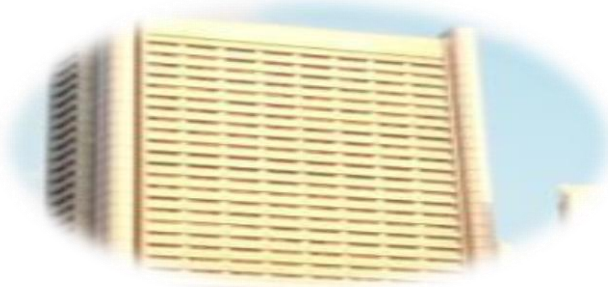
**Duchess of Kent Children Hospital**

University of Hongkong

Sandy Bay Road, Hongkong

## Fellowship duration

August 19<sup>th</sup>, 2015 to November 19<sup>th</sup>, 2015



Asia Pacific Spine Society

The **APOA-APSS Clinical Spine Fellowship 2015** started from 19<sup>th</sup> August to 19<sup>th</sup> November 2015. I was elated with joy when I received letter of acceptance from the APOA committee early this year.

It was also special since I have always held this center in high spirits considering the excellent clinical and academic standards maintained in the department. This is only possible because of stalwarts like Prof. KMC Cheung, Prof. KDK Luk, Prof YW Wong and the team efforts they put in.

I have been to the center before as APOA-APSS Travelling Spine Fellow back in November 2013. But this time I had a chance to accomplish more in terms of learning, training, research work and understanding the Hongkong way of life.

After some visa delays and timely assistance from Ms April, I boarded my flight from New Delhi and after about 5 hours I landed at Hongkong airport early morning. It was a bright and sunny day in Hongkong. I checked in Hotel Mia Casa, Kennedy Town pre-arranged by the university. The accommodation was comfortable and transport to the hospitals was straightforward from here. There were lot of restaurants and 7-eleven stores nearby to take care of the daily needs.

I was briefed about my schedule well in advance. I went straight to DKCH (Duchess of Kent Children Hospital) at Sandy bay. I greeted my professors and colleagues and joined the morning rounds. I was indeed delighted to see my APSS travelling co-fellow Dr. Masatoshi Teraguchi who was working as research scholar at the university.

I truly appreciate the efforts put into the arrangements from the organisation. I felt, Eureka!!!... The fellowship has finally started.

### Weekly work schedule of Division of Spine Surgery, HKU, Hongkong

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<b>AM</b>	<b>9:00 am</b> Scoliosis Clinic- DKCH OR  <b>8:30 am</b> OT at QMH	<b>8:30 am</b> OT at DKCH	<b>8:30 am</b> Ward Round at DKCH  <b>10:30 am</b> Clinical Conference at DKCH/QMH	<b>8:30 am</b> OT at DKCH	<b>8:30 am</b> Ward Round at QMH  <b>10:30 am</b> Research Activity	<b>8:30 am</b> Academic Activity- Interhospital meet
<b>PM</b>	Research Activity OR  OT at QMH	OT at DKCH	<b>2:00 pm</b> Adult Spine Clinic at DKCH	OT at DKCH	<b>1:00 pm</b> Pre-op Meeting at QMH  <b>2:00 pm</b> General Spine Clinic at QMH	FREE

### Daily Fellowship Record

Date/Day	Schedule	Consultant	Learning Process
<b>August 2015</b>			
19/Wed	Ward Rounds-DK Clinical Meet- QMH	Prof.KMC, KDK, Wong	Ward Rounds- Adolescent Idiopathic Scoliosis, Cervical Spondylotic Myelopathy Morbidity & Mortality (M&M) Meet
20/Thur	OT-DK Adult Spine Clinic-DK	Prof. Cheung, Kenny, Jason	1. OPLL+CSM-Cervical Laminoplasty 2.AIS- PSF 3. Old Burst # L1- Implant Removal Distraction Clinic For MCGR
21/Fri	Ward Rounds-QMH Pre And Post Op Meet	Prof. Luk, Wong	Discussed Sacral Chordoma, Lumbar Spine Trauma, Burst Fracture, Central Cord Syndrome In Hyperextension Injury, Prof. KMC Cheung's Discussion On Growing Rods, Adding- On Phenomenon, Fulcrum Bending Radiograph Concept And Its Evolution, General Spine Clinic



22/Sat	Academic Activity- Case Conference At Queen Elizabeth Hospital	Prof. KMC, Prof. Wong	Discussed Tumour Cases Distal Radius Fracture Cases
23/Sun	Free	--	Explored Kennedy Town, Updated Log Book
24/Mon	OT-QMH	Prof. Wong, KDK	Sacral Chordoma- Revision Surgery(Debulking)
25/Tues	OT- DKCH	Prof. Wong, Jason	Cervical Laminoplasty For CSM
26/Wed	Ward Rounds-DK Clinical Meet- QMH	Prof. Luk, Wong	Discussed Cases In Ward, Post Op Cases, Halo Traction System(Deformity With Deficit),
27/Thur	OT-DKCH Adult Spine Clinic-DK	Prof. Luk, Jason	1. 2.
28/Fri	Ward Rounds- QMH Pre And Post Op Meet	Prof. Luk, Wong	Ward Rounds QMH- Infective Spondylodiskitis, C1 Burst Fracture(Jefferson #)- Occipito-Cervical Fusion General Spine Clinic- Discussed Low Back Pain, Atlanto Axial Instability, C1-C2 Fusion, Scoliosis Follow-Up Cases, Telephonic Follow-Up System
29/Sat	Academic Activity- Case Conference At DKCH	Orthopaedics	Infections In Orthopaedics- Discussed Difficult Cases, New Methods Of Rapid Diagnosis And Management- Masquelet Technique(Induced Membrane), PCR For Diagnosis, How To Increase Culture Yield In Orthopaedic Infections
30/Sun	Free	--	Wan Chai And Causeway Bay
31/Mon	OT- QMH	Prof. Wong, Kenny	1. Cervical Laminoplasty For CSM, 2. C4-C5 Posterior Screw Fixation (Lateral Mass) For C4-C5 Facet Subluxation And Posterior Instability
<b>September 2015</b>			
01/Tue	OT-DKCH	Prof. Luk, Cheung	1. Congenital Scoliosis- Posterior Spinal Fusion, 2. L3-L4-L5 Canal Stenosis Without Instability (Grade 1 Spondylolisthesis At L4-L5)- Posterior Decompression( B/L Laminoforaminotomies) Only Dinner Symposium- Prof. Boachie Ohenaba Adjei (Mesa' Rail Spine System)
02/Wed	Grand Rounds- DKCH Clinical Meet- QMH	Prof. Cheung, Kenny	Case Discussion- Cambodia(Dr. Kenny, Prof. Cheung) Talk By Prof. Boachie (FOCOS) +Case Discussion Adult Spine Clinic- DKCH
03/Thur	Public Holiday	-	-
04/Fri	Ward Rounds- QMH Academic Lecture	Prof. Wong, Luk, Cheung	The Hongkong Distinguished Lecture By Prof. Chow(Orthopaedics)- Li Ka Shing Faculty Of Medicine
05/Sat	Academic Activity	Orthopaedics	Completed Log Book
07/Mon	Clinic DKCH	Prof. Cheung	Scoliosis clinic
08/Tue	OT-DKCH	Prof. Wong	Cervical laminoplasty
09/Wed	Grand Rounds- DKCH Pre And Post-Op Meet	Prof. Kenneth, Prof. Wong	Spine Team Lunch (Chinese-Chi Fu Tao Hung) Seminar On Lower Limb Amputations Spine Clinic- DKCH
10/Thur	OT-DKCH	Prof. Wong, Prof. Cheung	1. AIS- Posterior fusion and instrumentation
11/Fri	Ward Rounds- QMH Pre And Post-Op Meet	Prof. Wong, Prof. Cheung	Spine Clinic-QMH
12/Sat	Academic Activity	-	Log Book Completion
14/Mon	OT-QMH	Prof. Wong, Kenny	1. C4/5, C5/6 Disc Prolapsed- Two Level ACDF With Tricortical Iliac Crest Bone Graft (No Instrumentation) 2. Degenerative Lumbar Spine L3/4/5 Canal Stenosis With Listhesis L3/4(Grade 1)- Decompressive Laminoforaminotomies+ Pedicle Screw Fixation L3/4+ Posterolateral Fusion
15/Tue	OT-DKCH	Prof. Wong,	1. Anterior Spinal Fusion In Thoracolumbar Scoliosis



		Cheung	2. Posterior Spinal Fusion In Double Thoracic Curve
16/Wed	Ward Rounds-DKCH Case Conference-QMH	Dr. Jason	Research Activity-DKCH Adult Spine Clinic-DKCH Discussed C1-C2 Rheumatoid Subluxation, Spinal Injury In Dish (Diffuse Idiopathic Skeletal Hyperostosis)
17/Thur	OT-DKCH	Prof. Cheung, Wong	Selective Thoracic Fusion In Double Major Curve AIS L1 Kyphoplasty (Balloon Kyphoplasty)
18/Fri	DKCH	Prof. Cheung	Academic Activity, Data Collection
19/Sat	Academic Activity	HKOA	Eastern Hospital, HK; 3D Printing Application In Orthopaedics
20/Sun	Free Day	-	Trip To Ngong Ping Village, Po Lin Monastery And Tian Shan Buddha Statue
21/Mon	QMH-OT	Prof. KMC, Kenny	AIS- Double Major Curve: Posterior Spinal Fusion+Instrumentation
22/Tue	OT- DKCH	Prof. KMC, Luk	1. Cervical Laminoplasty For Cervical Myelopathy (Multilevel Disc Disease) 2. Posterior Spinal Fusion For Thoracolumbar Scoliosis (Flexible Curve)
23/Wed	Grand Rounds-DKCH	Prof. KMC, Luk, Wong	Visiting Prof.- Dr. Gruenberg (Argentina) Discussed Ward Cases Case Conference At QMH AO Classification Of Thoracolumbar Trauma Talk On New Imaging System (EOS)
24/Thur	OT-DKCH	Dr. Mak	1. Baclofen Test Dose 2. Posterior Decompressive Laminoforaminotomies For Lumbar Canal Stenosis (4 Levels)
25/Fri	Rounds- QMH	Dr. Mak, Jason	Discussed Ward Cases Academic Activity In Afternoon Did Measurements For My Study
26/Sat	Academic Activity	-	DKCH, Talk On Infections In Paediatric Cases
27/Sun	Academic Activity	-	Spine Summit Meet- Hongkong 2015
28/Mon	Clinic DKCH	Prof. Kenneth	Scoliosis clinic
29/Tue	OT- DKCH	Prof. Wong, Kenneth	1. L3/4/5 Canal Stenosis- Post. Decomp + Fusion (Laminoforaminotomies) 2. AIS- Post. Spinal Fusion
30/Wed	Ward Rounds-DKCH Case Conference-QMH	Prof. Wong, Kenneth	Discussed Ward Cases Case Conference At QMH

### October 2015

01/Thur	Public Holiday	-	-
02/Fri	Rounds-QMH	Prof. Kenneth	Discussed Ward Cases Academic Activity In Afternoon Did Measurements For My Study
03/Sat	Academic Activity	-	Interhospital Meeting
05/Mon	Clinic DKCH	Prof. Cheung	Scoliosis clinic
06/Tue	OT-DKCH	Prof. Wong	1.Cervical Kyphosis+Stenosis+ Myelopathy- Halo Ring Insertion 2.AIS- PSF+ Instrumentation 3.Cervial Myelopathy- C3-C6 Laminoplasty 4.AIS- PSF+ Instrumentation
07/Wed	Ward Rounds-DKCH Case Conference-QMH	Prof. Kenneth, Prof. Wong	Discussed Ward Cases Case Conference At QMH
08/Thur	OT-DKCH	Prof. Wong, Prof. Cheung	1. Lumbar Canal Stenosis- Post. Decomp 2. Cervical Myelopathy- C4/5 ACDF 3. Scoliosis+ Osteogenesis Imperfecta- Halo Ring Insertion
09/Fri	Rounds-QMH	Prof. Wong, Prof. Cheung	Discussed Ward Cases Academic Activity In Afternoon Did Measurements For My Study
10/Sat	Academic Activity	-	Interhospital Meeting



12/Mon	Clinic DKCH	Prof. Cheung	Scoliosis clinic
13/Tue	OT-DKCH	Prof. Cheung Prof. Wong	1. Juvenile Idiopathic Scoliosis- PSF (Mesa System) 2. Kyphosis Correction- Instrumented Fusion + Osteotomy
14/Wed	Ward Rounds-DKCH Case Conference-QMH	Prof. Kenneth, Prof. Wong	Discussed Ward Cases Case Conference At QMH
15/Thur	OT-DKCH	Prof. Wong, Prof. Cheung	Cervical Myelopathy- C3-C6 Laminoplasty Lumbar Canal Stenosis- PSF L3/4 + TLIF
16/Fri	Rounds-QMH	Prof. Wong, Prof. Cheung	Discussed Ward Cases Academic Activity In Afternoon Did Measurements For My Study
17/Sat	Academic Activity	-	Interhospital Meeting
19/Mon	OT-QMH	Prof. Cheung Prof. Wong	1. Cervical Laminoplasty 2. Thoracic Myelopathy-OPLL/OYL T9-L1: Post. Decompression + Fusion
20/Tue	OT-DKCH	Prof. Wong	1. C5/6 Facet Subluxation- ASF 2. Lumbar Stenosis L3/4/5- Post Decomp+ Fusion 3. Scoliosis+ Osteogenesis Imperfecta- PSF + Instrumentation
21/Wed	Ward Rounds-DKCH Case Conference-QMH	Prof. Kenneth, Prof. Wong	Discussed Ward Cases Case Conference At QMH
22/Thur	OT-DKCH	Prof. Wong, Prof. Cheung	Lumbar Stenosis L3/4 + Listhesis- Post. Decomp + TLIF
23/Fri	Rounds-QMH	Prof. Wong, Prof. Cheung	Discussed Ward Cases Academic Activity In Afternoon Did Measurements For My Study
24/Sat	Academic Activity	-	Interhospital Meeting
26/Mon	OT-QMH	Prof. Cheung	Cervical TB+ Kyphosis- Occipito-Cervical-Thoracic Fusion+ Instrumentation + Ant. Cage
27/Tue	OT-DKCH	Prof. Wong	1. CSM- C5/6 Ant. Decomp + Fusion 2. AIS- PSF+ Instrumentation 3. Quadriplegic Cp- Baclofen Pump Replantation
28/Wed	Ward Rounds-DKCH Case Conference-QMH	Prof. Kenneth, Prof. Wong	Discussed Ward Cases Case Conference At QMH
29/Thur	OT-DKCH	Prof. Wong, Prof. Cheung	L3/4 Spondylolisthesis- OLIF + Cortical Bone Trajectory (CBT) Screw Fixation
30/Fri	Rounds-QMH	Prof. Wong, Prof. Cheung	Discussed Ward Cases Academic Activity In Afternoon Did Measurements For My Study
31/Sat	Academic Activity	-	Interhospital Meeting, Research Work

### November 2015

02/Mon	Clinic DKCH	Prof. Cheung	Scoliosis clinic
03/Tue	OT-DKCH	Prof. Wong	Cervical laminoplasty, ACDF
04/Wed	Ward Rounds-DKCH Case Conference-QMH	Prof. Kenneth, Prof. Wong	Discussed Ward Cases Case Conference At QMH
05/Thur	OT-DKCH	Prof. Wong, Prof. Cheung	Old T10-L5 Fusion + L5-S1 Degen. Scoliosis- Post. Decomp. + Fusion Extension To S1-S2+ TLIF L5-S1
06/Fri	Rounds-QMH	Prof. Wong, Prof. Cheung	Discussed Ward Cases Academic Activity In Afternoon Did Measurements For My Study
07/Sat	Academic Activity	-	Interhospital Meeting, Research Work
09/Mon	OT- QMH	Prof. Cheung	Fusion extension for PJK in osteoporotic spine
10/Tue	OT-DKCH	Prof. Wong	L4/5 Spondylolisthesis + Stenosis- Post. Decomp + Fusion Cervical Myelopathy- C4/5 ACDF Rt. L4/5 PIVD- Revision Dissectomy Cervical Myelopathy- Laminoplasty
11/Wed	Ward Rounds-DKCH Case Conference-QMH	Prof. Kenneth, Prof. Wong	Discussed Ward Cases Case Conference At QMH Prof. Hodgson visiting professorship lecture



12/Thur	OT-DKCH	Prof. Wong, Prof. Cheung	AIS-Double Major Curve- PSF+ Instrumentation
13/Fri	Rounds-QMH	Prof. Wong, Prof. Cheung	Discussed Ward Cases Academic Activity In Afternoon Did Measurements For My Study
14/Sat	Academic Activity	-	Interhospital Meeting
16/Mon	OT-QMH	Prof. Cheung	1. Degen. Scoliosis + PJK- Extension Of Fusion 2. Central Cord Syndrome- C3/6 Laminoplasty
17/Tue	OT-DKCH	Prof. Wong	1. L4/5 Spinal Stenosis- Decomp+ Fusion 2. C3/4 PIVD- C3/4 ACDF 3. L3/4 Listhesis+Stenosis- Decomp+ Fusion 4. L3/4 Stenosis+ Lt. Radiculopathy- Lt. L3/4 Transforaminal Epidural Steroid
18/Wed	Ward Rounds-DKCH Case Conference-QMH	Prof. Wong	
19/Thur	OT-DKCH	Prof. Wong	
20/Fri	Return- End Of Fellowship	-	Came Back To India

## Log Book- Operation Theatre

Date	Age/ Sex	DIAGNOSIS	PROCEDURE	Faculty	Remarks	Center
20-Aug	65/f	Cervical Spondylotic Myelopathy + OPLL(Ossified Posterior Longitudinal Ligament)	Cervical laminoplasty (open door)	Dr. Cheung	Hirabayashi type	DKCH
20-Aug	15/f	Adolescent Idiopathic Scoliosis (AIS)	Posterior spinal fusion(PSF)	Dr. Wong, Kenny	Instrumented fusion	DKCH
24-Aug	74/m	Sacral chordoma(revision)	Surgical debulking	Dr. Wong	Prone/ant approach	QMH
25-Aug	14/m	Congenital scoliosis with D12 hemivertebra	Posterior spinal fusion(PSF)	Dr. Luk, Jason	Alternate level fixation	DKCH
25-Aug	48/f	F/U/C of L3 vertebrectomy + anterior expanding cage and posterior screw fixation	Screws removal and shortening of instrumentation (proximal and distal)	Dr. Wong	Bony fusion	DKCH
25-Aug	15/f	Adolescent Idiopathic Scoliosis	Post. Spinal Fusion	Dr. Luk	Instrumentation	DKCH
27-Aug	34/f	Post sacral excision deformity + L5 pain	Lumbo-Sacro-iliac instrumented fusion	Dr. Wong, Jason	Sacroiliac screws	DKCH
31-Aug	65/F	CHRONIC SPONDYLOTIC MYELOPATHY	LAMINOPLASTY	DR. WONG	Hirabayashi type	QMH
31-Aug	48/M	C4-C5 FACET SUBLUXATION + POSTERIOR INSTABILITY	C4-C5 POSTERIOR SCREW FIXATION	DR. KENNY, PAUL	Lateral mass screws	QMH
01-Sep	15/m	Congenital scoliosis	Posterior spinal fusion (T2-L4) + instrumentation	Dr. Luk, Jason	Wedge resection+ Ponte osteotomy	DKCH
01-Sep	77/f	L3/4,L4/5 Stenosis + L4/5 Spondylolisthesis	Posterior decompression L3/4, L4/5 + fusion	Dr. Cheung	Instrumentation	DKCH
07-Sep	15/f	Spine deformity- hyperlordosis + scoliosis	Deformity correction + multiple Ponte osteotomies + posterior spinal fusion	Dr. Kenneth	? Noonan syndrome- hyperlordosis, Co-Cr rods	QMH
08-Sep	48/f	Cervical + upper thoracic OPLL	Cervical laminoplasty T1-T3; Thoracic Laminectomy +/- fusion	Dr. Wong, Jason	Instrumentation	DKCH



08-Sep	64/f	Left L4/5 stenosis + spinal claudication	Left L4/5 transforaminal epidural steroid injection	Dr. Cheung	Local anesthesia	DKCH
08-Sep	65/f	Thoracic OYL (OLF)	Posterior decompression + fusion	Dr. Luk, Kenny	Non- instrumented	DKCH
08-Sep	27/f	C3/4 unilateral facet dislocation	C3/4 posterior spinal fusion	Dr. Luk, Paul	Lateral mass screws, Rugby player	DKCH
10-Sep	80/f	L4/5 Spondylolisthesis + Spinal stenosis	L4/5 decompression + posterolateral fusion + instrumentation	Dr. Wong		DKCH
10-Sep	15/f	Scoliosis T10- L3	Anterior Spinal Fusion + instrumentation	Dr. Wong, Dr. Philip	Thoracolumbar scoliosis, lateral position	DKCH
10-Sep	46/f	Left sciatica	L4/5 epidural injection	Dr. Jason	Transforaminal	DKCH
14-Sep	47/m	Cervical myelopathy- C4/5/6 disc	Two level ACDF	Dr. Wong, Dr. Kenny	Retrovertebral disc	QMH
14-Sep	77/f	Lumbar Spondylolisthesis L4/5 with stenosis L2/3, 3/4, 4/5	L2/3/4/5 decompression + L4/5 posterolateral fusion	Dr. Kenny, Philip	Laminoforaminotomy	QMH
15-Sep	14/f	Adolescent Idiopathic Scoliosis	Anterior Spinal Fusion (ASF) + instrumentation	Dr. Wong, Paul	Thoracolumbar scoliosis, lateral position	DKCH
15-Sep	15/f	Adolescent idiopathic scoliosis	Posterior spinal fusion(PSF) + instrumentation	Dr. Cheung, Jason	Double thoracic curve	DKCH
17-Sep	79/f	L1 fracture non-union	Kyphoplasty	Dr. Wong, Cheung	Balloon kyphoplasty	DKCH
17-Sep	16/f	Adolescent idiopathic scoliosis	Posterior spinal fusion (T4-T12) + instrumentation	Dr. Cheung	Alternate level screw strategy (ALSS)	DKCH
21-Sep	17/m	Adolescent idiopathic scoliosis	Posterior spinal fusion + instrumentation	Dr. Kenneth, Kenny	Double major curve, ALSS	QMH
22-Sep	15/m	Adolescent idiopathic scoliosis	Posterior spinal fusion + instrumentation	Dr. Kenneth, Cheung	Thoracolumbar curve	DKCH
22-Sep	65/f	Cervical myelopathy- C3/4/5/6 disc	Laminoplasty	Dr. Luk, Jason	Hirabayashi type, plate fixation	DKCH
24-Sep	10/m	Scoliosis + cerebral palsy	Baclofen test dose	Dr. Mak	Baclofen- GABA analogue	DKCH
24-Sep	60/m	Lumbar canal stenosis L2/3/4/5/S1	Posterior decompression	Dr. Mak	Laminoforaminotomy	DKCH
29-Sep	53/m	Lumbar canal stenosis L3/4/5	Posterior decompression + fusion	Dr Cheung	Laminoforaminotomy	DKCH
29-Sep	12/f	Adolescent idiopathic scoliosis	Posterior spinal fusion + instrumentation	Dr Cheung		DKCH
06-Oct	79/f	Cervical kyphosis+ cervical canal stenosis+myelopathy	Halo ring insertion+ traction	Dr Cheung		DKCH
06-Oct	12/f	Adolescent Idiopathic Scoliosis	Deformity correction + posterior spinal fusion	Dr Wong, Kenny		DKCH
06-Oct	57/m	Cervical myelopathy	Laminoplasty C3-C6	Dr Cheung		DKCH
06-Oct	15/f	Adolescent Idiopathic Scoliosis	Posterior spinal fusion	Dr Wong, Jason		DKCH
08-Oct	65/f	Lumbar canal stenosis	Post. Decompression+ fusion	Dr Wong		DKCH
08-Oct	64/f	Cervical myelopathy	C4/5 ACDF	Dr Wong		DKCH
08-Oct	17/m	Scoliosis+ osteogenesis imperfecta	Halo ring insertion+ traction	Dr Jason		DKCH
13-Oct	15/m	JIS	PSF+ instrument	Prof.Kenneth Cheung	<b>MESA system</b>	DKCH



13-Oct	7/f	Kyphosis	Implant removal+ release+ osteotomy+instrumented fusion	Dr Wong		DKCH
15-Oct	76/m	Cervical myelopathy	Laminoplasty	Dr Cheung		DKCH
15-Oct	48/f	Lumbar spinal stenosis	TLIF+ PSF L3-L4	Dr Wong		DKCH
19-Oct	60/f	Cervical myelopathy	C3/6 laminoplasty	Dr Wong		QMH
19-Oct	65/m	Thoracic myelopathy- OPLL/OYL T9/L1	Post. Decompression+ fusion	Dr Wong	Instrumented fusion	QMH
20-Oct	53/m	C5/6 facet subluxation	C5/6 ASF+ instrumentation	Dr Cheung		DKCH
20-Oct	77/m	Lumbar stenosis L3/4/5	Post decomp + fusion	Dr Cheung		DKCH
20-Oct	17/m	Scoliosis +osteogenesis imperfecta	Post spinal fusion	Prof. Kenneth		DKCH
22-Oct	64/f	Lumbar stenosis L3/4 + listhesis	Posterior decompression+ TLIF	Dr Wong, Jason		DKCH
26-Oct	79/f	Old cervical Tb + kyphosis	Occipito-cervical-upper thoracic fusion (posterior OC fusion + ant. Cage)	Dr Wong	Prone, then supine	QMH
27-Oct	41/m	Cervical Spondylotic Myelopathy	C5/6 ant. Decomp + fusion	Dr Wong	Supine	DKCH
27-Oct	12/f	AIS	PSF+ instrument	Dr Cheung	ALSS	DKCH
27-Oct	22/F	QUADRIPLGIC CP	Baclofen pump replantation	Dr Wong		DKCH
29-Oct	75/f	L3/4 Spondylolisthesis	L3/4 ant + post fusion (OLIF + CBT SCREW FIXATION)	Dr Kenneth	Old l3/4 decomp, 2006; l4/5 post-lat fusion, 2009	DKCH
	83/M	L2-S1 spinal stenosis	Posterior decompression L3/4, L4/5	Dr Jason	Symptomatic level decomp	DKCH
03-Nov	71/m	Lumbar canal stenosis l3/4, l4/5	Posterior decompression	Dr Cheung	Non- instrumented	DKCH
03-Nov	83/m	Lumbar canal stenosis l2/3, l3/4	Posterior decompression	Dr Jason	Non- instrumented	DKCH
03-Nov	78/f	Lateral recess stenosis l4/5	Transforaminal injection	Dr Cheung	Local anesthesia	DKCH
03-Nov	47/m	Old operated kyphoscoliosis with Luque instrumentation with distal skin impingement	Distal implant shortening	Dr Jason	Luque rods with sublaminar wiring	DKCH
03-Nov	50/f	Low back pain	Trial of facet joint block	Dr Cheung		DKCH
05-Nov	66/f	Old operated spine with t10-l5 fusion, with l5-s1 degenerative scoliosis, rt. L5 radiculopathy	Post. Decompression+ fusion, extension of fusion to S1-S2+ TLIF cage L5-S1	Dr Wong	Transverse rod connector	DKCH
10-Nov	73/F	L4/5 Spondylolisthesis + Spinal stenosis	Post decompression + fusion	Dr Wong	Instrumentation	DKCH
10-Nov	45/m	Rat l4/5 PIVD	Revision discectomy L4/5 Rt	Dr Kenny	Dural tear- patch graft repair	DKCH
10-Nov	65/m	Cervical myelopathy	C4/5 ACDF	Dr Jason	One level cad without instrumentation	DKCH
10-Nov	58/m	Cervical myelopathy	Laminoplasty	Dr Jason, Dr Wong	Arch plate	DKCH
12-Nov	15/f	AIS double major curve	PSF+ instrumentation	Dr Kenneth	ALSS	DKCH
15-Nov	50/m	C5/6, C6/7 disc herniation	C5/6, C6/7 Ant. spinal fusion	Dr Kenneth		QMH
16-Nov	60/f	Degenerative scoliosis + PJK	Extension of fusion	Dr Kenneth	ALSS + cable fixation	QMH
16-Nov	58/m	Central cord syndrome	C3-6 laminoplasty	Dr Kenneth		QMH
17-Nov	59/m	L4/5 spinal stenosis	L4/5 decompression + posterolateral fusion + instrumentation	Dr Cheung	Old L5 sup. End plate #	DKCH
17-Nov	64/f	C3/4 PID	C3/4 ACDF	Dr Wong, Kenny	Uninstrumented fusion	DKCH
17-Nov	80/f	L3/4 listhesis + stenosis	L3/4 Post. decomp + fusion	Dr Wong	Instrumented fusion	DKCH
17-Nov	78/f	L3/4 stenosis	Lt L3/4 transforaminal epidural steroid injection	Dr Cheung		DKCH
19-Nov	68/f	Adjacent segment degeneration	Fusion extension	Dr Wong	Instrumented fusion	DKCH

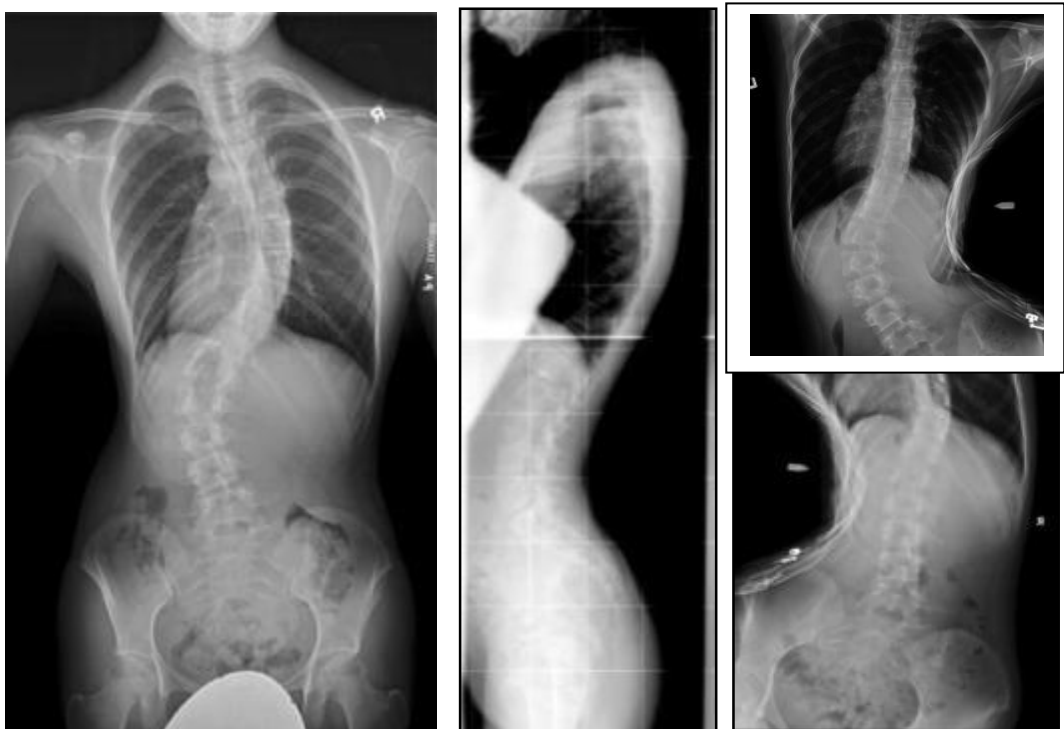
### Case Examples





### 1. Adolescent Idiopathic Scoliosis (AIS)

A 10-yr old female with double major curve was diagnosed initially in 2010. She was on underarm brace and regular follow-up. There was documented curve progression despite bracing (T4-T11: 43.5°; T11-L3: 43.8°). Fulcrum bending x-ray showed CSVL crossing L3 and Grade II rotation. Posterior spinal fusion surgery was done in 2015 from T4 to L3 with Alternate Level Screw Strategy (ALSS) technique. Hooks were used proximally to prevent proximal junctional kyphosis (PJK).



Pre-op X-ray-double major curve (Lenke III), Correction in Fulcrum Bending Radiograph (FBR)



Post-operative X-ray showing Alternate Level Screw Strategy (ALSS)

#### Fulcrum Bending Radiograph-

This concept of fulcrum bend and flexibility of scoliosis curve was described by Prof. Luk et al at this center of excellence. This concept has been further developed to determine the limits of correction, identifying fusion levels in a rational manner and also in proving decoupling of spine in a bending radiograph. This technique has been modified further by using a new fulcrum developed and patented at this center.

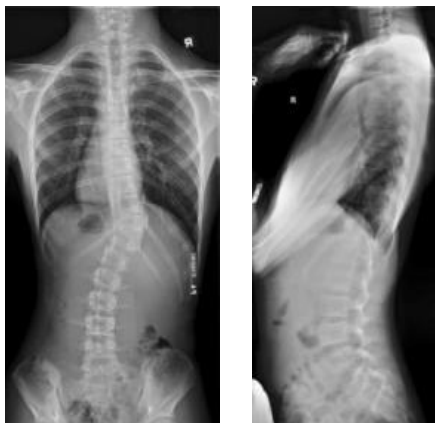
#### Alternate Level Screw Strategy (ALSS)-

In this screw strategy, alternate levels were instrumented in flexible curves. This reduces the stiffness and may reduce adjacent segment degeneration. The risk of neurological injury is minimized and it is more cost-effective. The minimal loss of curve correction on follow-up is within limits when compared to all level screw placement.

### 2. Congenital Scoliosis (Unsegmented Bar)



A 10-yr old male child was referred from School Health Screening (SHS) system. He was found to have unsegmented bar T11-T13 and T12-13 right side wedged vertebra) on radiographs. Spinal cord was normal on MRI evaluation. On curve progression (T11-L4: 25.2°), he was given underarm brace and kept under follow-up. On fulcrum bending radiograph, the curve was rigid at thoracolumbar junction. He was planned for surgery to avoid secondary compensatory changes in lumbar spine and short segment posterior fusion from T9-L1 was done. (Note: this patient has 13 pair of ribs).



Pre-op AP and Lat X-rays (2010) - unsegmented bar and wedged vertebra at TL junction, Risser 0



DRU classification for maturity assessment (Luk et al) - Comparison of distal radius and ulna physis between 2010 and 2015)



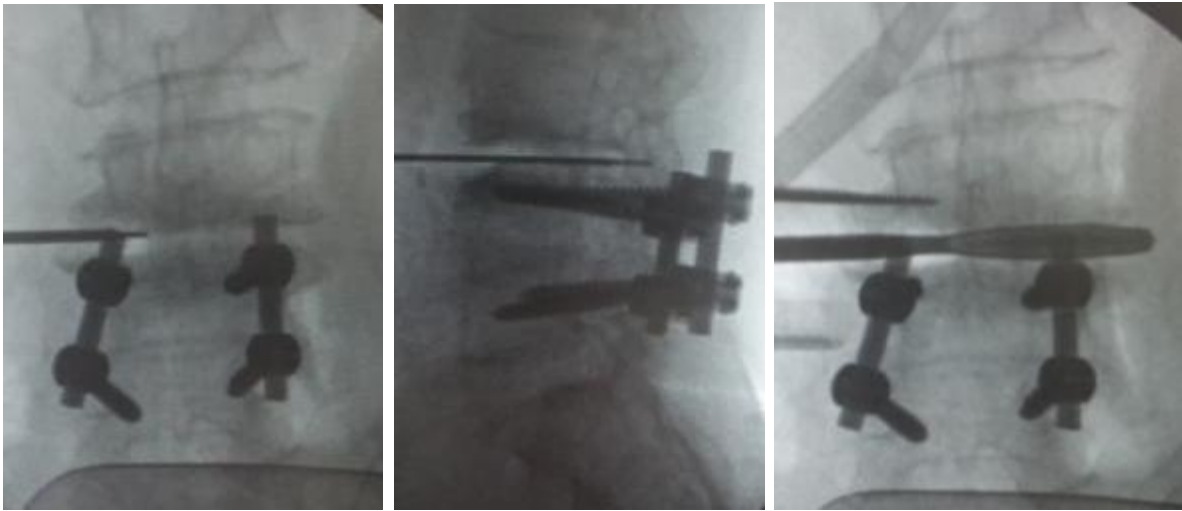
Post-operative AP and Lat X-rays showing short segment posterior fusion. Risser is still 0. This shows the importance of DRU classification (Luk et al)

### 3. Adjacent segment degeneration (Lumbar spine)

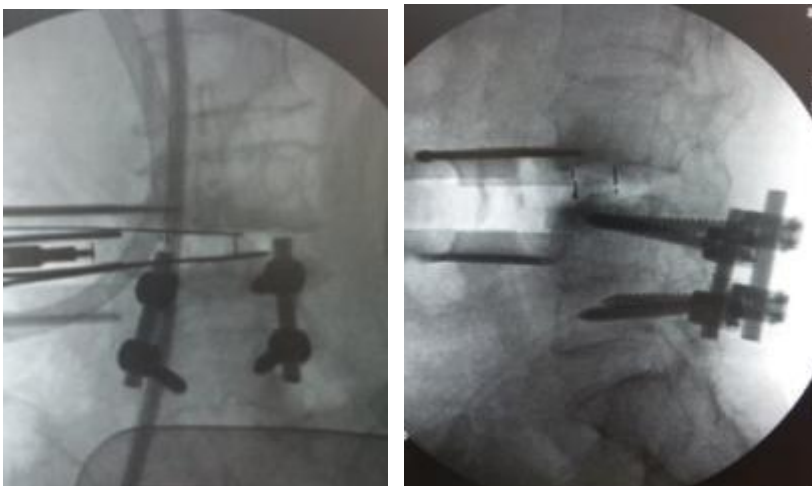
A 75-yr old lady with previously operated lumbar spine with instrumented fusion developed adjacent segment degeneration and deformity. She was evaluated and planned for anterior fusion with OLIF cage and posterior instrumentation with cortical bone purchase screw with fusion. This was the first OLIF case performed at the hospital.



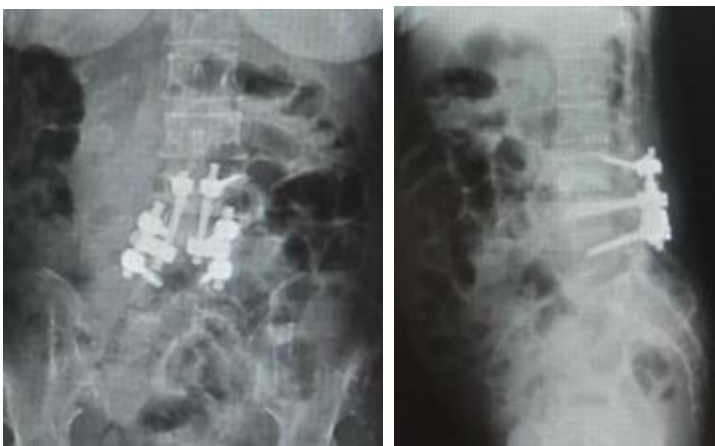
The procedure was performed by Prof. Kenneth Cheung and team under image guidance. OLIF is another technique for anterior spinal fusion. The principles remain the same. The technique is relatively demanding. It has certain advantages such as in upper lumbar levels it can be performed without neuromonitoring as in this procedure the psoas is retracted posteriorly rather than through the muscle trajectory. The cage is of sufficient size which helps in early fusion. Another technical aspect is that the OLIF cage provides edge loading, therefore the opposite annulus has to be detached carefully so that the cage sits 5-mm beyond the vertebral body.



Stepwise depiction of OLIF for adjacent segment degeneration. Identification of landmarks in AP and Lateral images. Clearing the opposite annulus is an important step in this procedure for edge loading



Final OLIF PEEK cage insertion under image intensifier guidance



Final AP and Lateral radiograph showing the OLIF PEEK cage position and CBT screw fixation



**Oblique Lateral Interbody Fusion (OLIF)**- At L2-L5, OLIF gives lateral access while preserving the psoas and avoiding the iliac crest. As the access path does not go through the psoas and the nervous plexus with OLIF, neuromonitoring has become optional. It is also more reproducible at L5-S1 level. The cage is of large size and based on edge loading principle.

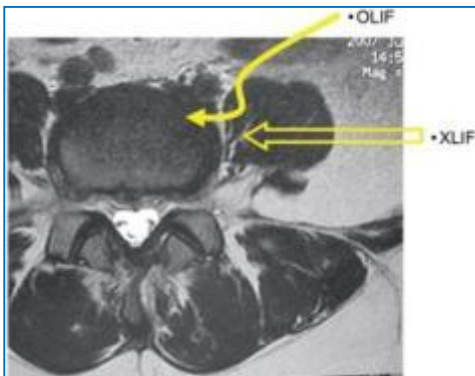
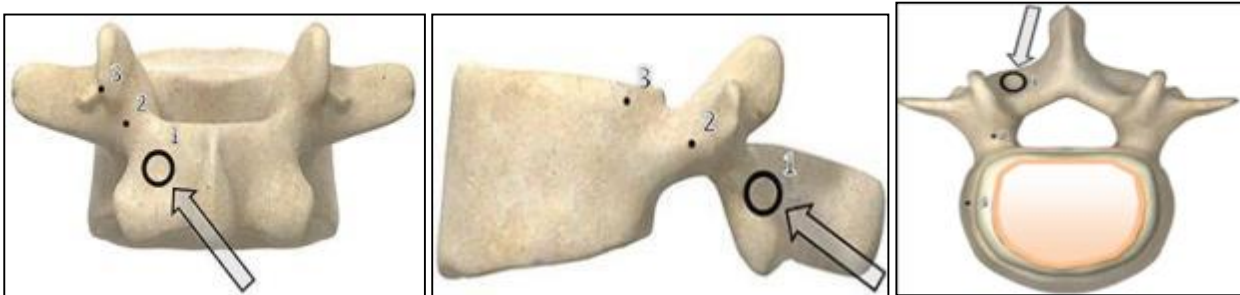


Image showing OLIF (Oblique Lateral) and XLIF (Direct Lateral) access paths for anterior fusion

**Medio-Latero-Superior trajectory/ Cortical Bone Trajectory screw technique- an alternate for pedicle fixation**

MLST/CBT technique was developed for use at superior end of a construct to limit the surgical dissection of the superior facet joint, reduce incision length and muscle dissection. This minimises approach related trauma during pedicle fixation. The starting point is on the medial pars and angulated in medio-lateral and caudo-cranial direction. This involves primarily cortical trajectory and is thought to have better bone fixation especially in osteoporotic bone.



**Medio-Latero-Superior/Cortical Bone Trajectory Screw Technique-** The entry point medial to pars, caudo-cranial and medio-lateral angulation. The screw length is shorter than standard pedicle screw.

**4. Anterior Spinal Fusion for Thoracolumbar Scoliosis (Lenke Type-5)**

A 15-yr old adolescent female presented with thoracolumbar curve with documented progression. Thoracolumbar curves have high progression rates and may lead to degenerative changes later on. She was planned for surgery and anterior spinal fusion was performed from T11 to L3. Prof. Wong demonstrated the anterior spinal fusion for scoliosis with great ease and it was indeed a pleasure to learn from him. The anterior approach can help preserve motion segments and it is cost effective in terms of fewer implants than posterior approach.



Pre-operative AP, Lateral and Fulcrum Bending radiographs showing thoracolumbar curve (Lenke Type 5) in a 15-yr old female



Post-operative radiographs showing anterior spinal fusion with instrumentation

### 5. Posterior cervical fusion- C3-C4 facet subluxation (Rugby injury)

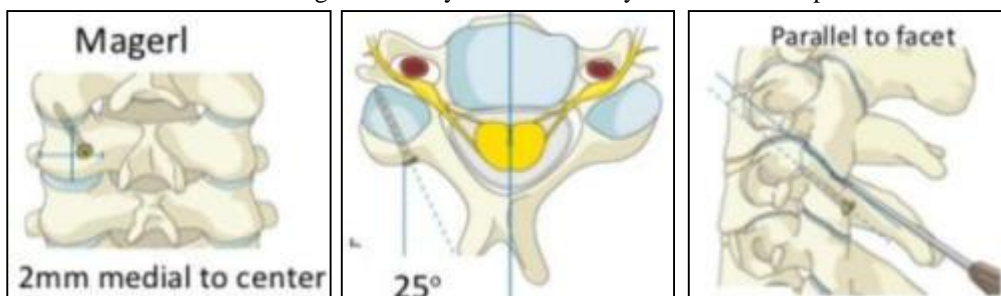
A 26-yr old female rugby player had a fall while playing. She presented to emergency with neck pain but there was no neurological deficit. Plain radiograph showed C3-C4 facet subluxation. Considering her active lifestyle, she was planned for surgery. Posterior C3-C4 fixation and fusion was performed with lateral mass screws.



Pre-op radiographs- C3-C4 facet subluxation. Post-op radiographs- C3-C4 fusion with lateral mass screws

### Subaxial cervical spine- Lateral mass screw technique (Magerl)

We followed the Magerl technique. The entry point was about 2mm medial to the center of lateral mass. The screw was angulated 25-30° medio-laterally to avoid injuring the vertebral artery and 25-30° in caudo-cranial direction avoiding the nerve root. The screw length is usually 20-24 mm. Polyaxial screws are put to assist in rod placement.



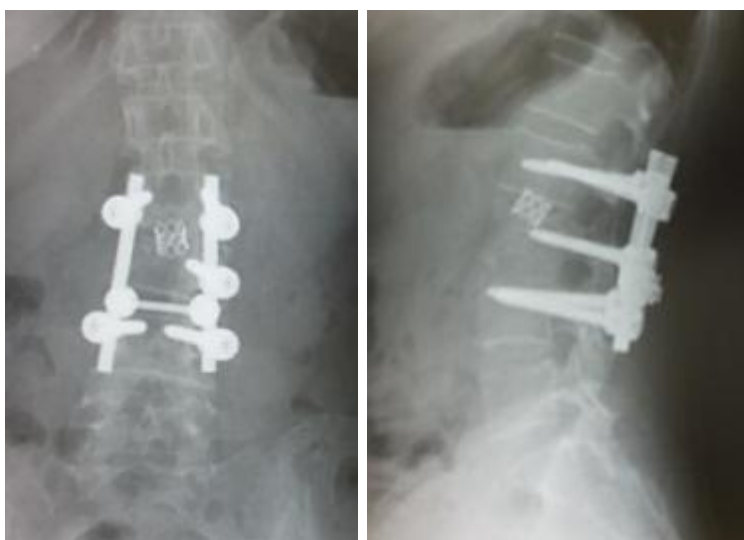
Magerl technique of lateral mass screw insertion- the entry point, medio-lateral and caudo-cranial angulation are shown.



### 6. Spondylodiskitis L2-L3: Decompression and 360° fusion

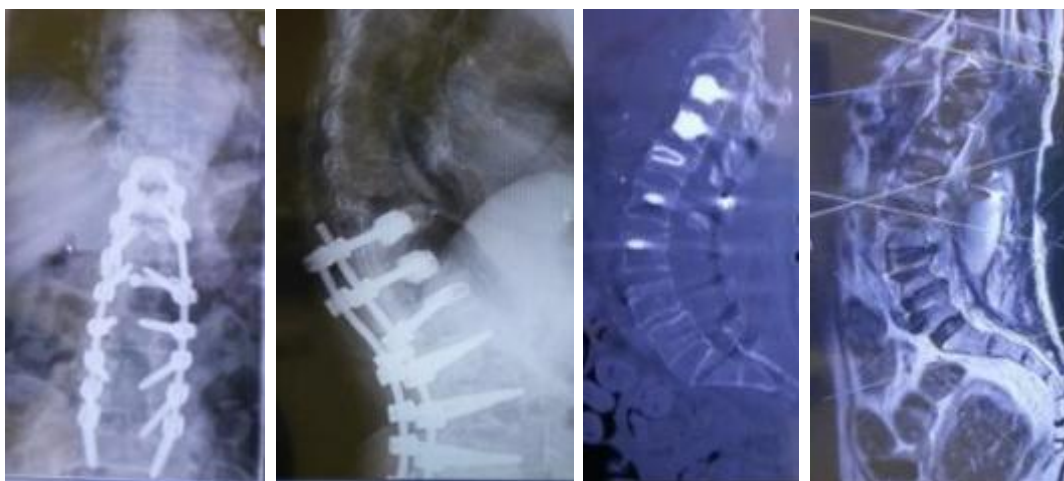


Pre-op radiographs and MRI scan showing spondylodiskitis L2-L3 with cord compression

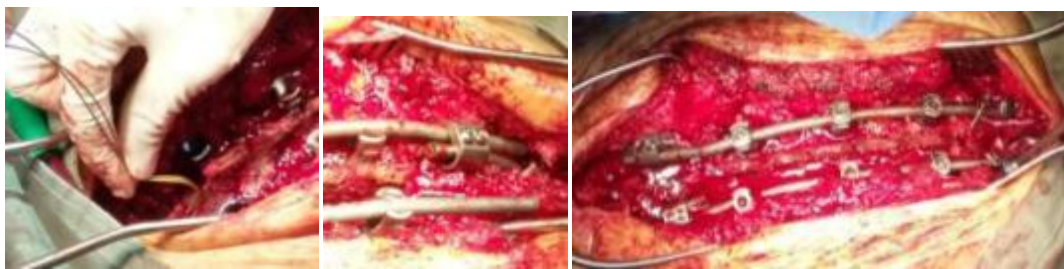


Post-op radiographs showing fixation with pedicle screws and anterior cage. There was non-union at anterior column but no screw loosening. Patient was kept under observation and regular follow-up.

### 7. Degenerative spine with Proximal Junctional Kyphosis (PJK) and osteoporosis



Radiographs of a 75-yr old female after the initial surgery at a different center showing lumbar spine instrumentation with proximal reinforcements using cage and PMMA for osteoporotic collapse. She developed proximal junctional kyphosis and presented with increasing back pain.



Extension of fusion was planned to upper thoracic level. Side to side connector was used for rods. Alternate level screws were used to extend the fusion. Hooks were used proximally to prevent PJK. Also, proximal hook was supplemented with sublaminar cable.

### 8. MIS decompression L4-L5 canal stenosis



MIS decompression for stenosis- MRI image, placement of MIS tube (METRx System), surgical team (Dr. Kenny Kwan and Dr. Masatoshi Teraguchi), intraoperative image showing the dura after decompression

### 9. Degenerative scoliosis and sacral fixation



Pre-op and post-op radiographs showing degenerative scoliosis with poor sagittal balance. Posterior fixation was done till sacrum for better curve control. Alternate level screw fixation, use of hooks proximally and fixation above T10 were used to reduce PJK.

### 10. Occipito- cervical fusion with anterior cage



Pre-op and post-op radiographs and MRI scans of a patient with long standing cervical deformity with cord compression. Initially posterior fixation was done in maximal cervical lordosis possible, and then anterior support with cage was provided in single sitting.

### 11. Neuromuscular scoliosis- Noonan syndrome with hyperlordosis

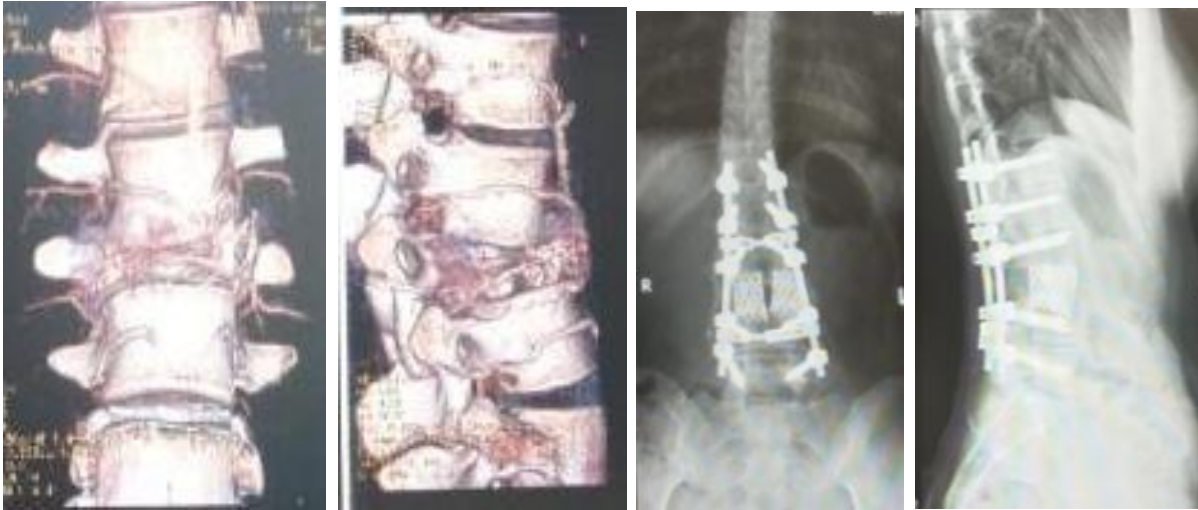


Pre-op and post-op radiographs of a patient with neuromuscular scoliosis with Noonan syndrome and hyperlordosis showing the correction after surgery. Posterior instrumentation with multiple Ponte osteotomies was done.

### 12. Lumbar spondylectomy with 360° fusion for L3 tumour







Pre-op angiogram showing L3 tumour and collapse. Post-op image showing ant-post fusion with Harm's cage after L3 spondylectomy.

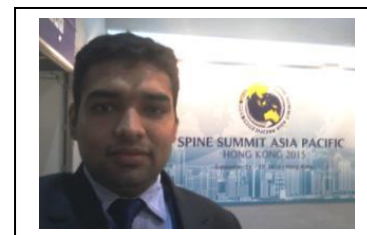
### Technological advances



1. EOS machine for low dose and ultra-low dose imaging with 3D reconstruction (left). It uses a novel technology and algorithm to reconstruct images after low dose image acquisition. It is especially useful in deformity as whole spine radiographs are required at frequent intervals. Ultra low dose image can help in Cobb angle estimation but may obscure finer details of individual vertebral bodies.
2. MESA system for deformity correction (right). MESA system uses an innovative reduction instrument called "cricket". It proposes to reduce screw head prominence and is a powerful deformity correction tool.

### International meetings

Hongkong is an educational hub. I attended the Asia-Pacific Spine Summit held during my stay. I also attended various Distinguished lectures and Visiting professorship lectures during this period.



### Academic excellence and research opportunity

I had the opportunity to pursue some academic activity under the mentorship of Prof. Kenneth Cheung. I learnt some basic research methodology and how to formulate and approach relevant clinical questions.





The stalwarts- Prof. Kenneth Cheung and Prof. Wong YW sharing their words of wisdom

### Fun and frolic

No fellowship is complete without an understanding of local way of life. I had many co-fellows in different sub-divisions. We went for hiking to few well marked country trails in Hongkong like the Maclehorse trail, Lantau island, Tai Mo Shan observatory. We enjoyed some beer at some of the less travelled beaches in Hongkong. Our chinese colleagues helped us in ordering the favorite “hot pot” dish. We also relished departmental dinners and get togethers as they provide an opportunity to interact in more casual way.

I found time out of our schedule to visit other places like “Ocean Park” and “Hongkong Disneyland”. The views from “The Peak” were mesmerising. “Harbour tour” was nice way to explore the world famous “Victoria Harbour”. It is one of the deepest natural harbours in the world.

I understood the local celebrations like “Mid-autumn Fest”, Fire Dragon dance and “National Day”.

It was indeed difficult to leave such an encouraging academic environment. I got some souvenirs from the HKU to cherish the memories of excellent time spent in Hongkong.



Time to relax- Blessings of Buddha, hiking trails and waterfalls, beer at beach, harbour by night, and international fellows group





The Spine Family- perfect blend of academics, research and dinner time get-togethers

### **Acknowledgement**

I thank once again the organisation: APOA-APSS, HKU Department of Orthopaedics and Traumatology for excellent training opportunity. I thank my mentor, Prof. Arvind Jayaswal for his guidance and support. I also thank each and every member of the Queen Mary Hospital and Duchess of Kent Children Hospital for making my stay wonderful.



Asia Pacific Spine Society