

## **APSS MEDTRONIC SPINE FELLOWSHIP 2016**

Fellowship Duration: 7 Aug 2017 – 9 Nov 2017

Fellow:

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Orthopedic Department of Wakayama Medical University

### **Introduction**

The APSS Medtronic Spine Fellowship Program is well-known to develop enthusiastic spine fellows by providing surgical exposure and training in excellent spine centers of Asia Pacific region. I was so excited once received the acceptance from the APSS committee in early 2016. The most important thing was being chosen in the spine centers led to Prof. Wong Chung Chek (Sarawak General Hospital) and Prof. Kwan Mun Keong (University Malaya Medical Center), both of them are famous for MIS surgery for spine deformity and adolescent idiopathic scoliosis, respectively.

After finishing my another clinical fellowship in Singapore, I began my training journey from Aug 7 to Sep 20 in Kuching and from 25 Sep to 9 Nov, 2017 in Kuala Lumpur. I felt honored and secured with Professor Wong and Prof Kwan's cordial arrangements of the travel from airport and a comfortable hotel to stay. First of all, I started my fellowship in Kuching. Prof. Wong explained to me the outline of my fellowship, brought me to check-in the operating theatre. Then, I started my 3 months fellowship life, first in the spine team of SGH. I was impressed by the great numbers and varieties of spinal operations. I spent almost 4 days in a week to observe and assist spine surgeries in the operating theatre. I was lucky to participate in a Kuching orthopedic spine course organized by Prof. Wong twice during my stay in Kuching. And also, I was able to join the surgeries, which has been done in other hospitals in Borneo Island and Cambodia. It was really good experience for me.

1<sup>st</sup> Host spine center:

Sarawak General Hospital, Kuching, Malaysia



Host Spine Surgeons:

Prof. Wong Chung Chek (Department of Orthopaedic and Traumatology,  
Sarawak General Hospital)



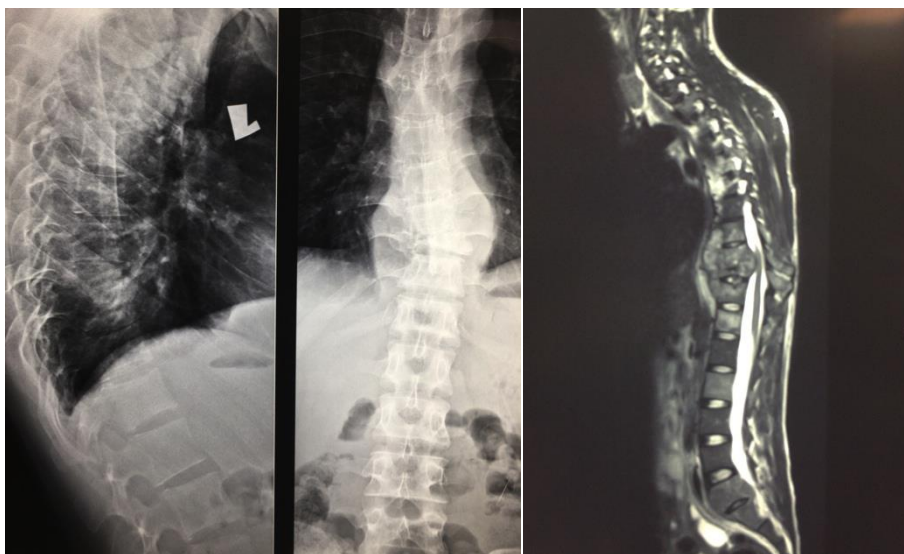
Schedule:

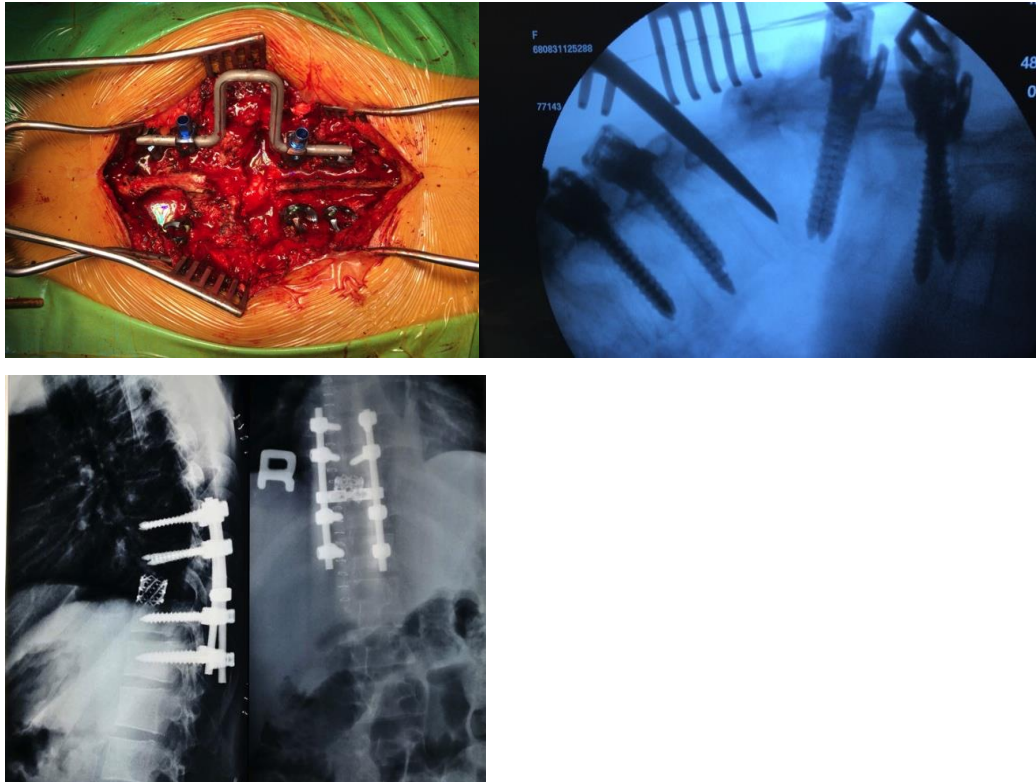
Monday	Tuesday	Wednesday	Thursday	Friday
8am-5pm	8am -5pm	8am -5pm	8am-5pm	8am-5pm
Whole day OT (Semi- emergency)	Morning -ward round  Teaching for fellows (after ward round)	Morning -ward round  Research meeting (after ward round)	Whole day OT (Elective)	Spine Clinic

1, Post TB kyphotic patient

49 y female patient with TB infection, spreading to T10,11 and L5.

T10 infection caused spinal cord compression, which resulting in muscle weakness and numbness. Pre-op, intra-op. and post-op. radiologic-clinical correction were shown. PSO and posterior spinal instrumentation/ fixation T8-L1 done. When doing the osteotomy, they normally use the special device (see below) to make a space to do osteotomy easily. They are quite familiar with doing osteotomy and just take less than 30 min to be done.



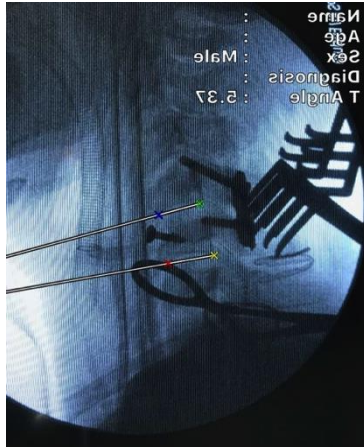


## 2, Cervical kyphotic deformity

16 y male Posttraumatic cervical kyphotic deformity patient.

Neurologically intact. Local kyphotic angle was 62 degree. He was showing severe neck pain. This operation was done in Children's Surgical in Cambodia. Center. As you can see in below, the operation room is only one. There were 5 beds in the operation room in a row. There was not sufficient instruments and equipment in the operation room. Anterior bone grafting was done in C4/5 and fixed with normal screw, subsequently posterior instrumentation was done with using conventional traumatic plate.





Kuching operative spine course (8/16, 17 and 9/13,14)



**KOSC 08/17**  
SPINE TEAM, SARAWAK GENERAL HOSPITAL





Fortunately, I have participated in the Kuching Operative Spine Course (KOSC) twice, which was held in 16-17, Aug and 13-14, Sep. It was a local spine live surgery course full of up-to-date spinal surgery. We spine fellows have good chance to exchange and discuss detail about spine surgeries. At the end of the day, the attending doctors including me enjoyed the great time of having local food together.



## Living in Kuching

During the 3-months stay in Malaysia, I have chance to visit many places to do the surgery. Kota Kinabalu, Sibul, Miri and so on. It was always great to taste the traditional local noodle and food. I am also grateful to travel the beautiful Kota Kinabalu in the holiday of the National Day with my wife together.

Finally, I came across the birthday party for Prof. CC Wong. He shows excellent leadership skill and is adored by subordinates. It was really fruitful to observe unique techniques of Prof. CC Wong in the various hospitals.







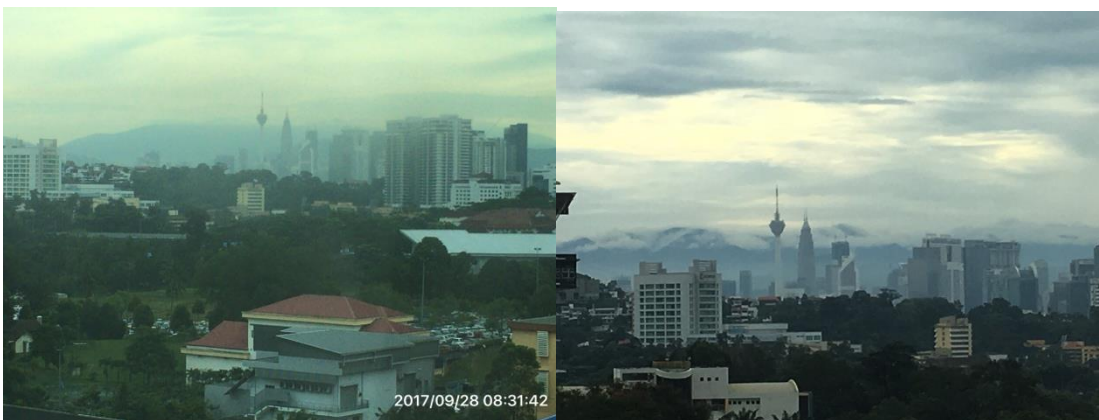
2<sup>nd</sup> Host spine center:

University Malaya Medical Center, Kuala Lumpur, Malaysia

Duration: 23 Sep 2017 – 9 Nov 2017

After finishing fellowship in Kuching, I joined the APSS annual meeting held in Goa, India. I was able to meet Prof. Kwan, who is the second host for me. Then, I moved to Kuala Lumpur from 25 Sep 2017 and started my fellowship.

UMMC



NOCERAL



Meeting in Spine Research Unit



Patients discharged from UMSC (University Malaya Specialist Clinic)






Host Spine Surgeons:

Prof. Kwan Mun Keong (Department of Orthopaedic, University Malaya Medical Center)






Schedule:



**UNIVERSITI  
MALAYA**  
KUALA LUMPUR

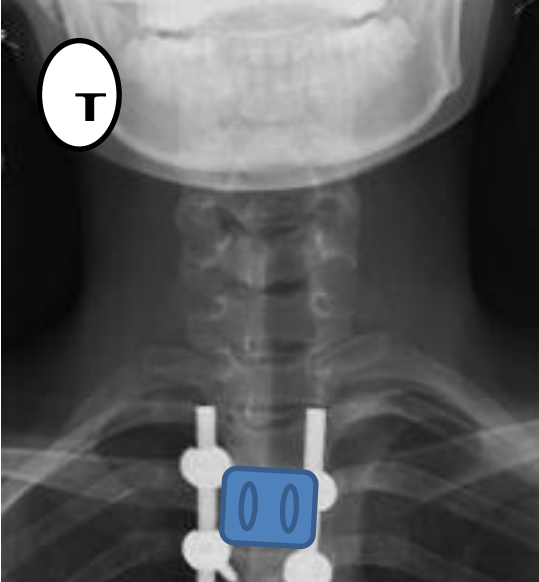
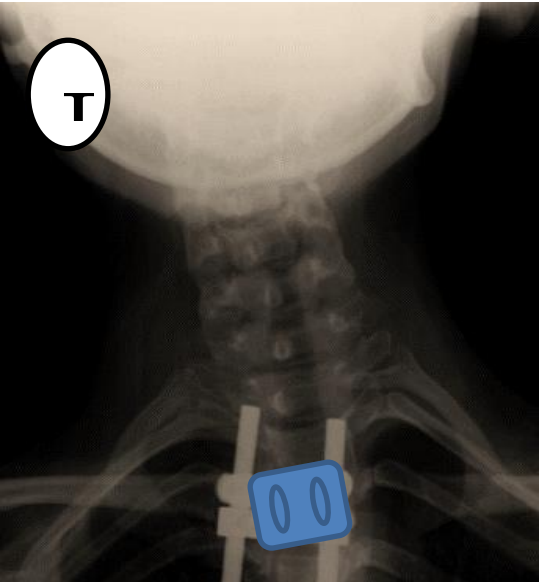
# Spine Team Weekly Roster



Time	Monday		Tuesday		Wednesday		Thursday	Friday	Saturday	Sunday or PH
7.15am to 8am	MO's Presentation	Research meeting	Pre-op presentation		MO's Presentation Journal presentation	Research meeting	Pre-op presentation	Ward round	UMSC OT (8am to 5pm)	Rest day
8am to 9am	MOs join research meeting or attend M&M meeting once a month		Elective OT	Long case teaching	MOs join research meeting			Long case teaching		
9am to 2pm	Grand ward round				Spine clinic		Elective OT	Scoliosis clinic		
2pm to 5pm	Pre-op assessment	Short case teaching fortnightly			Pre-op assessment			Personal research time		
5pm to 10pm	UMSC OT				UMSC OT			UMSC OT		
	*Scheduled On-call MO & lecturer stand by for any emergency referral & spine operation 24 hours/day & 7 days/week									
	*Scheduled On-call MO does ward round daily 9am-12pm									

Principle of AIS surgery

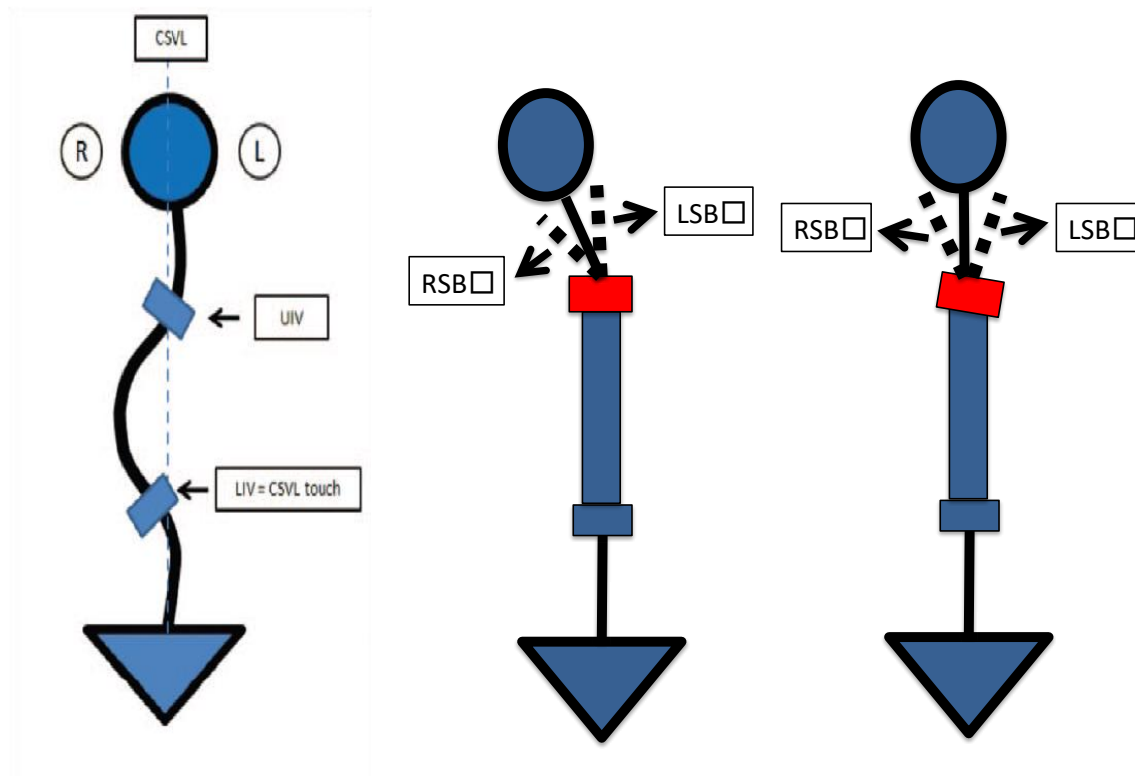
1, Balancing



First of all, I learned the principle of AIS surgery, especially focused on balancing of whole spine including cervical spine. I will describe the balancing way in AIS surgery that I have learned in UMMC.

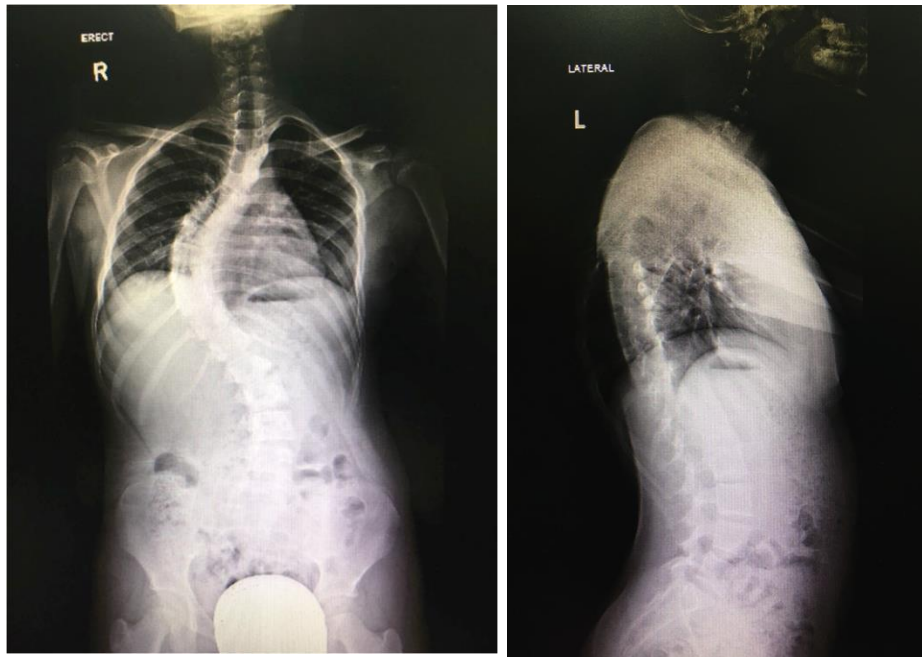
#### A, Evaluation

In UMMC, the patients were evaluated by whole spine including cervical spine. The ability of the proximal thoracic segment to compensate to CSVL is dependent on the flexibility of the proximal thoracic segment on left side bending. The side bending radiograph was performed with the assistance of the surgeon.

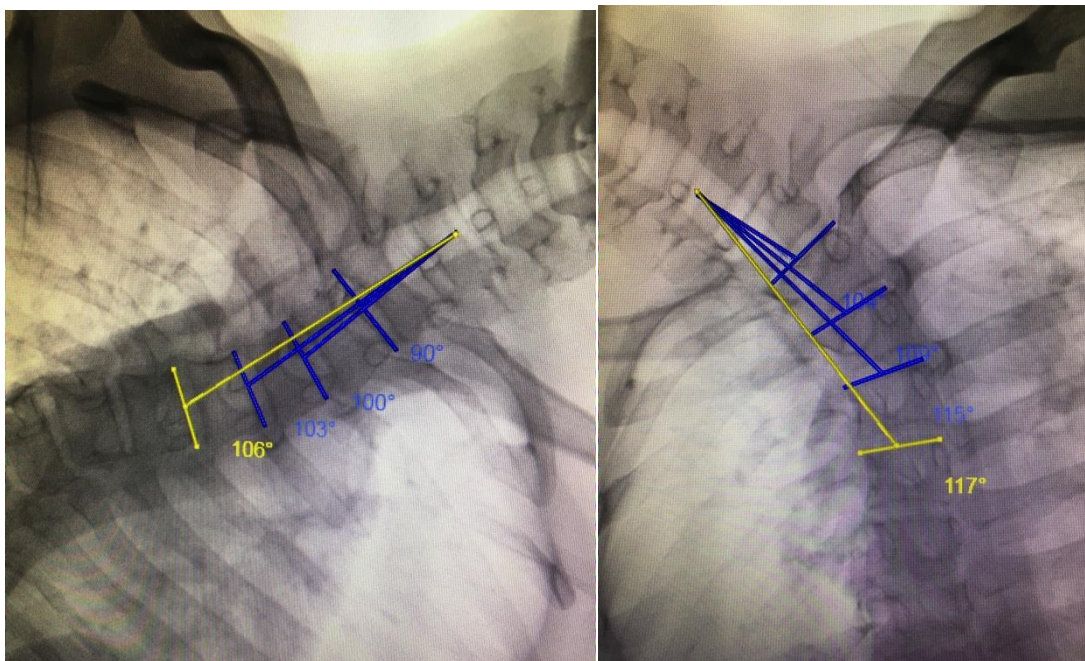


#### B, Selection and tilting of UIV and LIV

Lenke 1AR T1 tilt positive



UIV selection

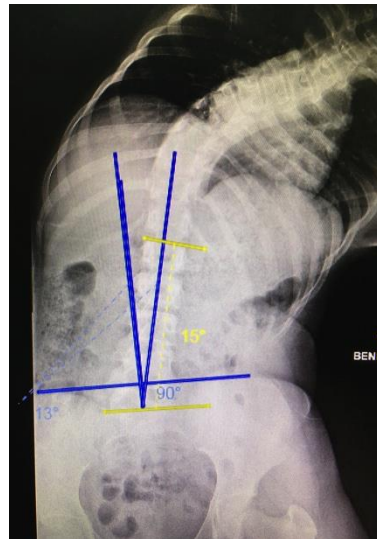


Left Bending film

Right Bending film

If I take T2, my calculation was  $-(0+14) \div 2 = -7$  (7 degree should be tilting toward left side)

If I take T3, my calculation was  $-(10+9)\div 2=-9.5$  (9.5 degree should be tilting toward left side)

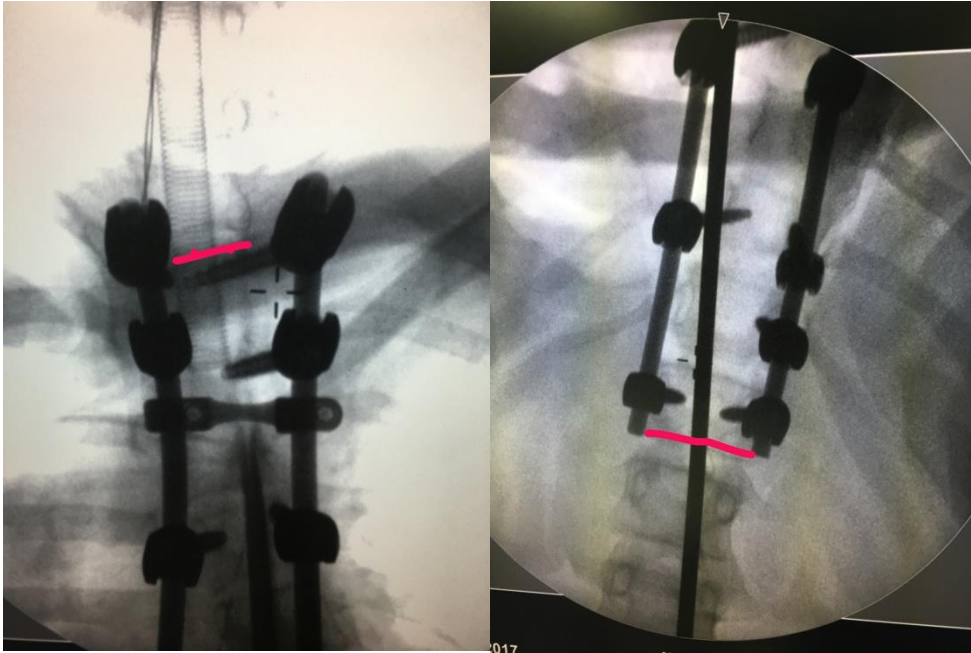


LIV selection

In this case, if we take maximum tilting toward left side, LIV of L1 is  $13-(-15)=+2$  (2 degree tilting toward right side). +5 to +10 degree can be accepted toward right side. So Ideal LIV tilting is +7 to +12.



### C. Intraoperative evaluation



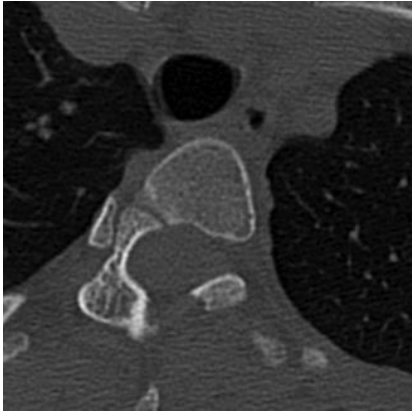
UIV=-7.5(toward left side)      LIV=+10 (toward right side)

UIV tilt and LIV tilt was calculated by using T bar. In this surgery, Ideal UIV tilt and LIV was -7 and +10, respectively. So, balancing was well done in this surgery.

## 2, Safety surgery

### Putting screw in AIS surgery

#### Upper thoracic (T2,3)



When putting screw in upper thoracic, trachea and aorta injury should be taken into consideration.

In UMMC, 25 mm pedicle screw was used in upper thoracic.

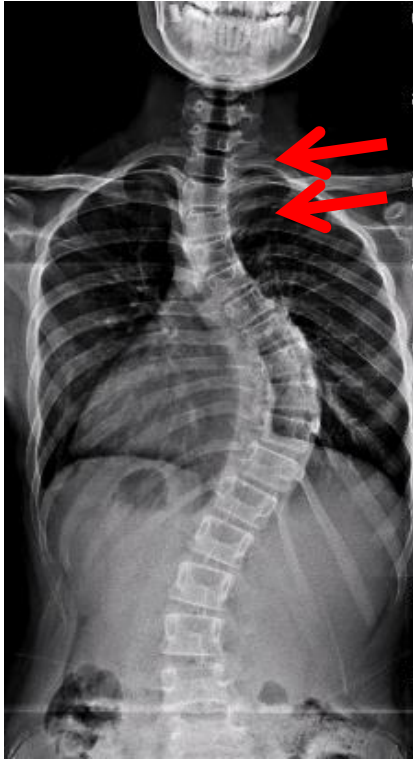
#### Lower thoracic (T10-12)



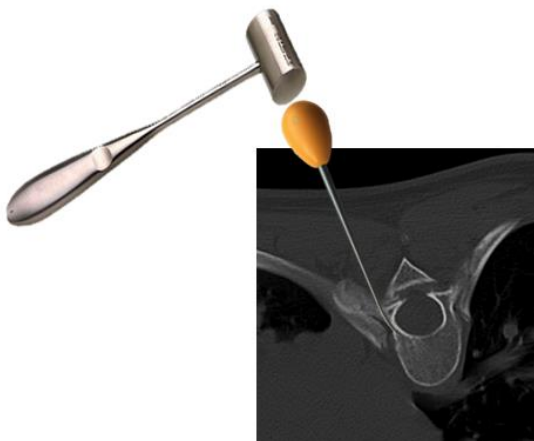
When putting screw in lower thoracic, aorta injury should be also taken into consideration in left side.

Putting screw towards outside is very dangerous.

## Extrapedicular technique

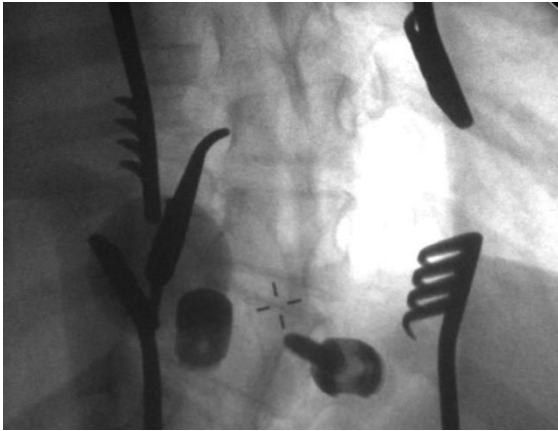


Dysplastic pedicle in T3, 4 and 5 of concave side (right side) is very common. In these cases, extrapedicular approach was normally used in UMMC.

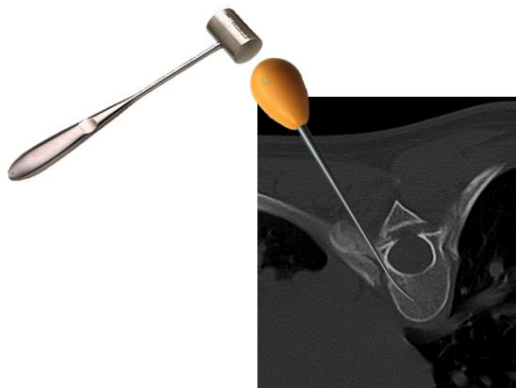


After removing the cortex of lamina, pedicle is identified.

However, in this case, we can not go through via pedicle. So, pedicle probe is knocked outside first, and then feel the rib head

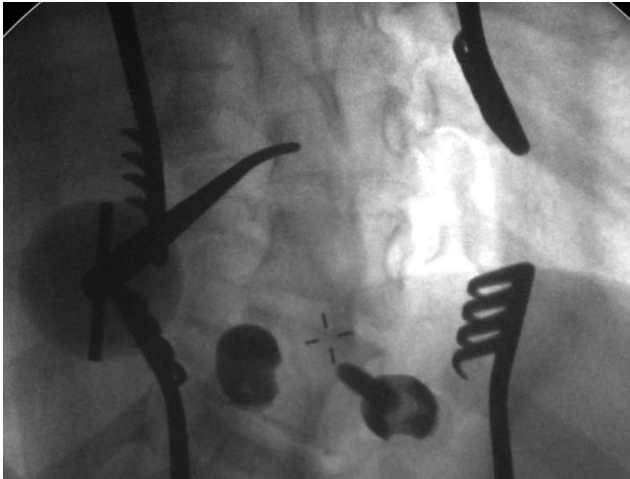


make sure the location of the probe

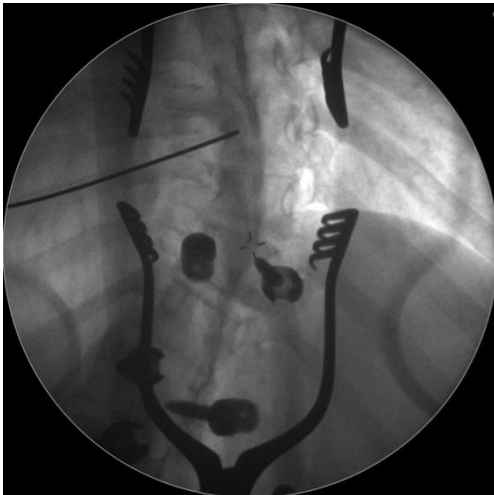


push into the vertebral body using mallet





make sure whether the probe is inside or not



Put the guide wire into the hole



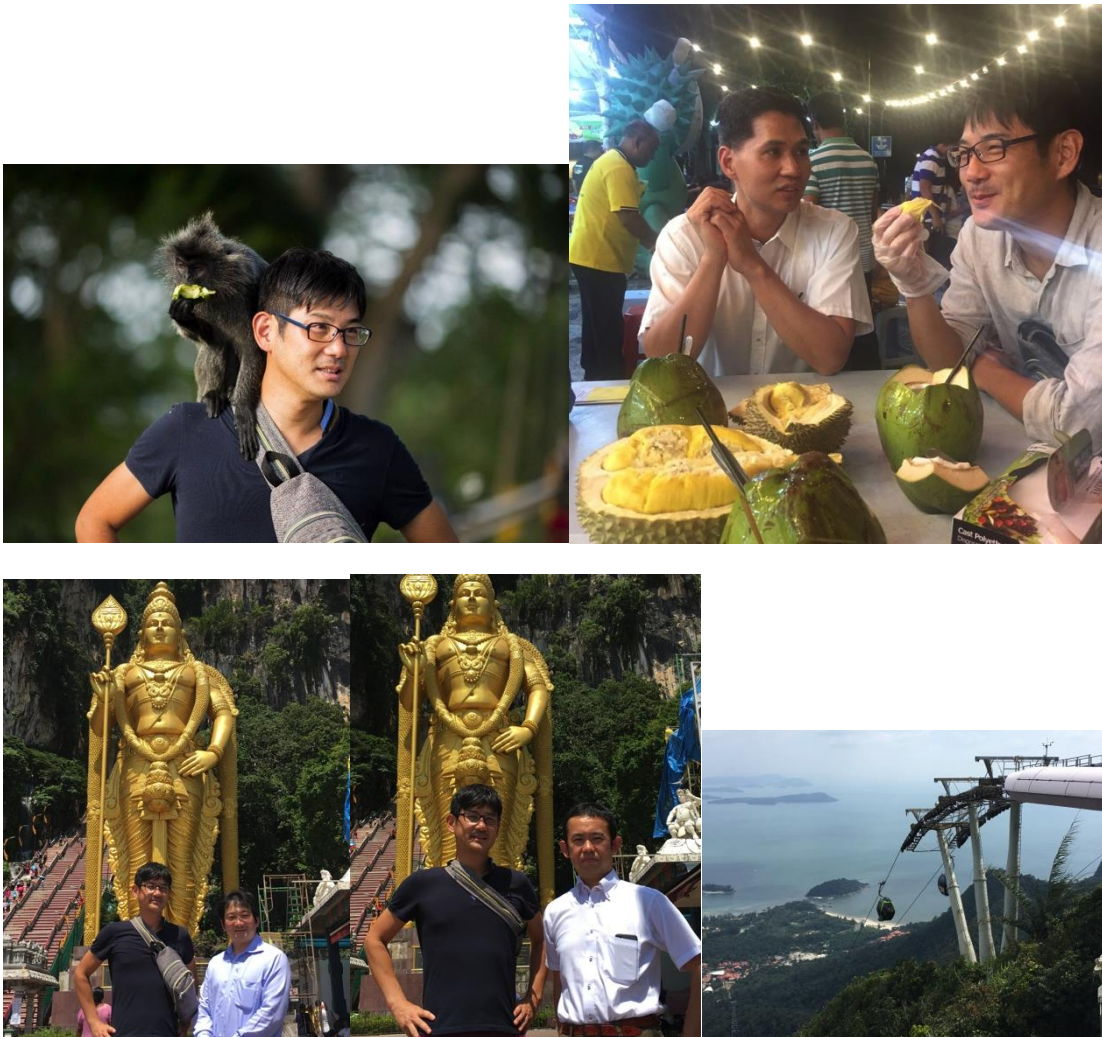
then, screw was placed and confirm again

## Living in Kuala Lumpur

During the 6 weeks stay in Kuala Lumpur, Malaysia, I have chance to visit many places for sightseeing. When JSSR fellows from Japan came to UMMC, they brought us to Kuala Selangor to see Monkey, Eagle and Firefly. The Malacca straight was so beautiful and sublime. The scenery remains in my memory.

Their hospitality was amazing and I had a good time in Kuala Lumpur. Also, it was really great time to observe unique techniques and principles of Prof. Kwan.





### Acknowledgement

Lastly, I thank for APSS which has granted me this treasurable opportunity of overseas spine fellowship training. I would never take it for granted to experience these 3 months of Malaysia life in such excellent spine centers.

## Logbook

No.	Date	Age	Sex	Diagnosis	Procedure	Surgeon	Role
1	8-Aug	75	Female	Cervical spondylotic myelopathy	Laminoplasty	Prof Wong	Assistant
2	8-Aug	65	male	Lumbar prolapsed disc	Discectomy	Dr Bryan	Assistant
3	8-Aug	46	Male	Cervical spondylotic myelopathy	ACDF	Prof Wong	Assistant
4	9-Aug	51	Male	Thoracic pathological fracture	T7- T12 instrumentation, PSO T10, decompression T9	Prof Wong	Assistant
5	9-Aug	55	Male	Hangman fracture Type 2A	ACDF	Prof Wong	Assistant
6	9-Aug	61	Female	L3/4 spondylolisthesis, L4/5 stenosis	L3/4/5 TLIF	Dr Bryan	Assistant
7	10-Aug	26	Female	Lumbar prolapsed disc	Discectomy	Prof Wong	Assistant
8	10-Aug	63	Male	Lumbar spinal stenosis	L4/5 TLIF	Prof Wong	Assistant
9	10-Aug	56	Male	Cervical spondylotic radiculopathy	ACDF	Prof Wong	Assistant
10	11-Aug	65	Male	Lumbar spinal stenosis	TLIF	Prof Wong	Assistant
11	11-Aug	61	Female	Lumbar prolapsed disc	Discectomy	Prof Wong	Assistant
12	11-Aug	35	Male	Cervical thoracic fracture	C5-T2 fusion with reduction	Dr Aida	Assistant
13	14-Aug	59	Female	Lumbar spinal stenosis	LSS L4/5, 5/S 2 level TLIF and L3/4 decompression	Prof Wong	Assistant
14	14-Aug	61	Female	Lumbar sponylolysis	L5/S PLF	Prof Wong	Assistant



15	15-Aug	26	Male	Ankylosing spine	L1 PSO with instrumentation from T11- L3	Prof Wong	Assistant
16	15-Aug	16	Female	Neuromuscular scoliosis	T5-L4 posterior fusion	Dr Bryan	Observer
17	15-Aug	48	Female	TB spine T10-11 with kyphosis	PSO and posterior spinal instrumentation / fixation T8-L1	Dr Bryan	Assistant
18	16-Aug	22	Female	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION OF T4 - L1	Prof Wong	Observer
19	16-Aug	78	Male	Lumbar spinal stenosis	(TLIF) OF L3/4 & POSTERIOR LUMBAR INTERBODY and FUSION (PLIF) OF L4/5	Prof Wong	Observer
20	17-Aug	61	Male	Lumbar spinal stenosis	MIS TLIF	Prof Wong	Observer
21	17-Aug	66	Female	L1 compression fracture with kyphosis	POSTERIOR SPINAL FUSION OF T11 - L3 and Pedicle Subtraction Osteotomy	Prof Wong	Observer
22	21-Aug	16	Male	Neurofibromatosis Neuromusculat Scoliosis	POSTERIOR SPINAL FUSION OF T3 - L3 and Vertebral Column Resection T7-9	Prof Wong	Assistant
23	23-Aug	75	Female	Degenerative Lumbar Scoliosis	T11- Sacral instrumentation	Prof Wong	Assistant

					with 3 level decompression		
24	24-Aug	28	Female	Prolapsed Intervertebral Disc	Discectomy	Dr Bryan	Assistant
25	24-Aug	18	Female	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION OF T3 - L2	Prof Wong	Assistant
26	28-Aug	58	Male	Relapsed peripheral nerve tumor	Tumorectomy and posterior spinal fusion of T10-L2	Prof Wong	Assistant
27	29-Aug	14	Female	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION OF T4 - L4	Prof Wong	Assistant
28	29-Aug	15	Female	Juveniles idiopathic scoliosis	POSTERIOR SPINAL FUSION OF T2 - L2	Prof Wong	Assistant
29	4-Sep	16	Male	Cervical kyphotic deformity	Anterior fusion and posterior instrumentation of C4-5	Prof Wong	Assistant
30	4-Sep	15	Female	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION OF T4 - L2	Dr Bryan	Assistant
31	5-Sep	56	Female	L1VF with kyphotic deformity	POSTERIOR SPINAL FUSION OF T12 - L2	Dr Bryan	Assistant
32	5-Sep	14	Female	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION OF T3 - L2	Prof Wong	Assistant
33	5-Sep	59	Female	L4 spondylolisthesis and L4/5spinal stenosis	L4/5 PLIF	Prof Wong	Assistant

34	6-Sep	14	Female	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION OF T4 - L3	Dr Bryan	Assistant
35	6-Sep	14	Female	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION OF T2 - L4	Prof Wong	Assistant
36	7-Sep	30	Male	T12 burst fracture	POSTERIOR SPINAL FUSION OF T10 - L1	Prof Wong	Assistant
37	7-Sep	58	Male	Lumbar spinal stenosis	L4/5 decompression	Prof Wong	Assistant
38	12-Sep	48	Female	Lumbar spinal stenosis	L3/4/5 TLIF	Prof Wong	Assistant
39	13-Sep	73	Female	L4 spondylolisthesis, Lumbar spinal stenosis	L4/5/S MIS TLIF	Prof Wong	Assistant
40	13-Sep	67	Female	T12 old compression fracture	POSTERIOR SPINAL FUSION OF T10 - L2	Prof Wong	Assistant
41	14-Sep	40	Male	Cervical radiculopathy due to disc prolapsed	Anterior fusion and posterior instrumentation of C45	Prof Wong	Assistant
42	14-Sep	20	Female	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION OF T4 - L4	Prof Wong	Observer
43	18-Sep	14	Female	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION OF T5 - L3	Prof Wong	Assistant
44	18-Sep	40	Male	Prolapsed Intervertebral Disc and central canal stenosis causing equina caudal syndrome	L4/5 TLIF	Prof Wong	Assistant

45	19-Sep	20	Female	Prolapsed Intervertebral Disc	L5/S Discectomy	Dr Bryan	Assistant
46	19-Sep	80	Female	T5 vertebral fracture	Vertebroplasty	Prof Wong	Assistant
47	19-Sep	49	Male	Cervical Prolapsed Intervertebral Disc	C6/7 ACDF	Prof Wong	Assistant
48	19-Sep	88	Male	L1 compression fracture with kyphosis	L1 vertebroplasty with T2/3 TLIF	Prof Wong	Assistant
49	26-Sep	21	Male	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION OF T2 - L2	Prof Chris	Assistant
50	26-Sep	62	Female	L4 spondylolytic spindylolisthesis and L4/5spinal stenosis	L4/5 TLIF	Prof Chris	Assistant
51	27-Sep	13	Female	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION OF T2 - L2	Prof Kwan	Assistant
52	28-Sep	56	Female	Lumbar spinal stenosis	L2/3,4/5 posterior decompression	Prof Chris	Assistant
53	2-Oct	77	Male	Lumbar discitis	Excision Biopsy	Prof Chris	Assistant
54	2-Oct	61	Female	Lumbar spinal stenosis	L3/4/5/S TLIF	Prof Chris	Assistant
55	4-Oct	50	Female	Prolapsed Intervertebral Disc	Discectomy	Prof Chris	Assistant
56	10-Oct	16	Female	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION OF T2 - L2	Prof Kwan	Assistant
57	10-Oct	28	Female	Adult scoliosis	POSTERIOR SPINAL FUSION OF T3 - L3	Prof Kwan	Assistant
58	11-Oct	70	Male	L2/3 PID with lumbar spinal stenosis	L2/3 TLIF	Prof Chris	Assistant

59	12-Oct	67	Male	L4/5 lumbar spinal stenosis	Posterior decompression	Prof Chris	Assistant
60	12-Oct	68	Female	L5 Spondylotic spondylolisthesis	L5/S TLIF	Prof Chris	Assistant
61	13-Oct	12	Female	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION OF T3 - L2	Prof Kwan	Assistant
62	13-Oct	16	Female	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION T3-L3	Prof Kwan	Assistant
63	14-Oct	27	Female	Prolapsed Intervertebral Disc	Posterior decompression	Prof Kwan	Assistant
64	14-Oct	21	Female	Prolapsed Intervertebral Disc	Posterior decompression	Prof Kwan	Assistant
65	14-Oct	67	Male	Lumbar spinal stenosis	Posterior decompression	Prof Kwan	Assistant
66	14-Oct	56	Female	Lumbar spinal stenosis	Posterior decompression	Prof Kwan	Assistant
67	16-Oct	16	Female	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION OF T3 - L1	Prof Kwan	Assistant
68	16-Oct	11	Female	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION OF T5 - L3	Prof Kwan	Assistant
69	17-Oct	13	Female	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION OF T2 - L4	Prof Kwan	Assistant
70	17-Oct	27	Female	Adult scoliosis	POSTERIOR SPINAL FUSION OF T3 - L1	Prof Kwan	Assistant



71	19-Oct	12	Female	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION OF T3 - L2	Prof Kwan	Assistant
72	19-Oct	81	Female	L1 compression fracture with kyphosis	POSTERIOR SPINAL FUSION OF T10 - L4	Prof Chris	Assistant
73	23-Oct	42	Male	Cervical Myelopathy	C3-6 laminectomy and fusion C7 dome laminectomy	Prof Chris	Assistant
74	24-Oct	59	Female	TB spine	PSO PSF	Prof Chris	Assistant
75	25-Oct	15	Female	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION OF T5 - L3	Prof Kwan	Assistant
76	26-Oct	59	Female	TB spine	T1-T7 PSF with PSO	Prof Chris	Assistant
77	27-Oct	15	Female	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION OF T2 - L1	Prof Kwan	Assistant
78	27-Oct	12	Female	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION OF T5 - L3	Prof Kwan	Assistant
79	28-Oct	12	Female	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION OF T2 - L1	Prof Kwan	Assistant
80	28-Oct	16	Female	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION OF T2 - L4	Prof Kwan	Assistant
81	1-Nov	61	Female	Lumbar spinal stenosis	L4/5/S PLF	Prof Kwan	Assistant
82	1-Nov	12	Female	Marfan syndrome Scoliosis	POSTERIOR SPINAL FUSION OF T2 - L3	Prof Kwan	Assistant

83	2-Nov	25	Female	Lumbar spinal stenosis	Posterior decompression	Dr. Chiu	Observer
84	2-Nov	60	Female	Lumbar prolapsed disc	Discectomy	Dr. Chiu	Observer
85	3-Nov	60	Male	Hangman fracture	C1-3 PSF	Prof Kwan	Assistant
86	3-Nov	71	Female	Vertebral fracture	Vertebroplasty	Prof Kwan	Assistant
87	3-Nov	85	Female	Vertebral fracture	Vertebroplasty	Prof Kwan	Assistant
88	7-Nov	12	Female	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION OF T5 - L3	Prof Luk	Assistant
89	8-Nov	14	Female	Adolescent Idiopathic Scoliosis	POSTERIOR SPINAL FUSION OF T2 - L5	Prof Kwan	Observer
90	8-Nov	61	Male	Odontoid fracture, Non union	C1-2 PSF	Prof Wang	Observer
91	8-Nov	31	Male	Burst fracture	POSTERIOR SPINAL FUSION OF T10 - L2	Prof Yang and Gabriel	Observer