

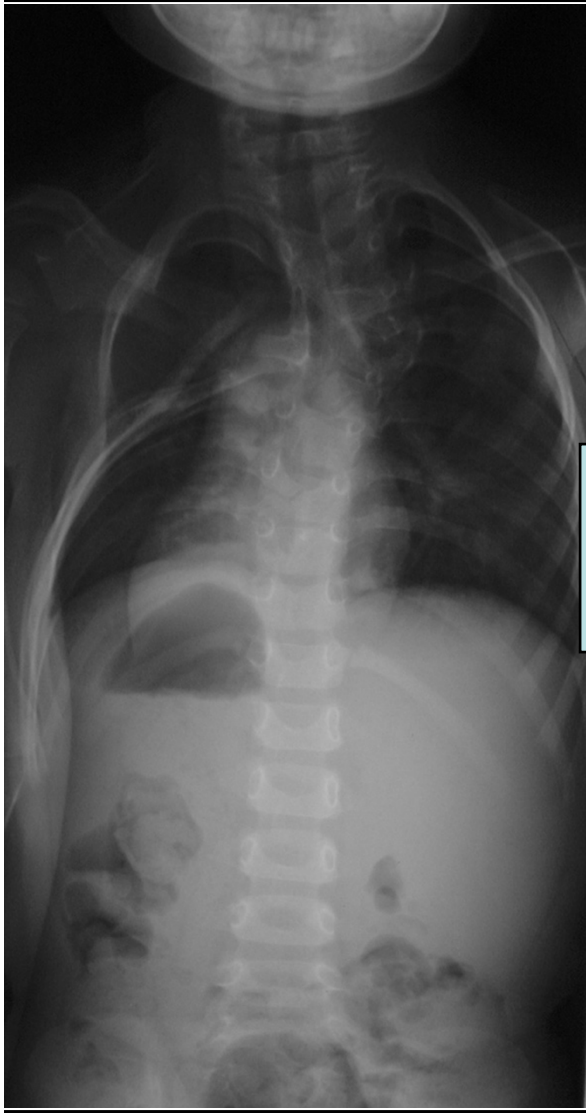
The Introduction of VEPTR Operations into Japan: The Report of First 33 patients.

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Expansion Thoracoplasty with VEPTR



Effective Procedure for TIS

Surgical Complications in VEPTR Surgery

■ Instrumentation-related

- Device migration
- Hardware prominence
- Device dislodgement
- Fracture of ribs, lamina
- Rod breakage

■ Infection

- Superficial
- Deep

■ Pulmonary

- Atelectasis
- Pneumonia
- Pleural effusion
- Hemothorax
- Pneumothorax
- Respiratory failure

■ Neurological

- Thoracic outlet syndrome
- Intercostal nerve irritation
- Decreased MEP

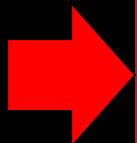
■ Skin

- Skin slough
- Decubitus
- Skin breakdown

■ Upper-extremity dysfunction

■ Death

■ Etc.



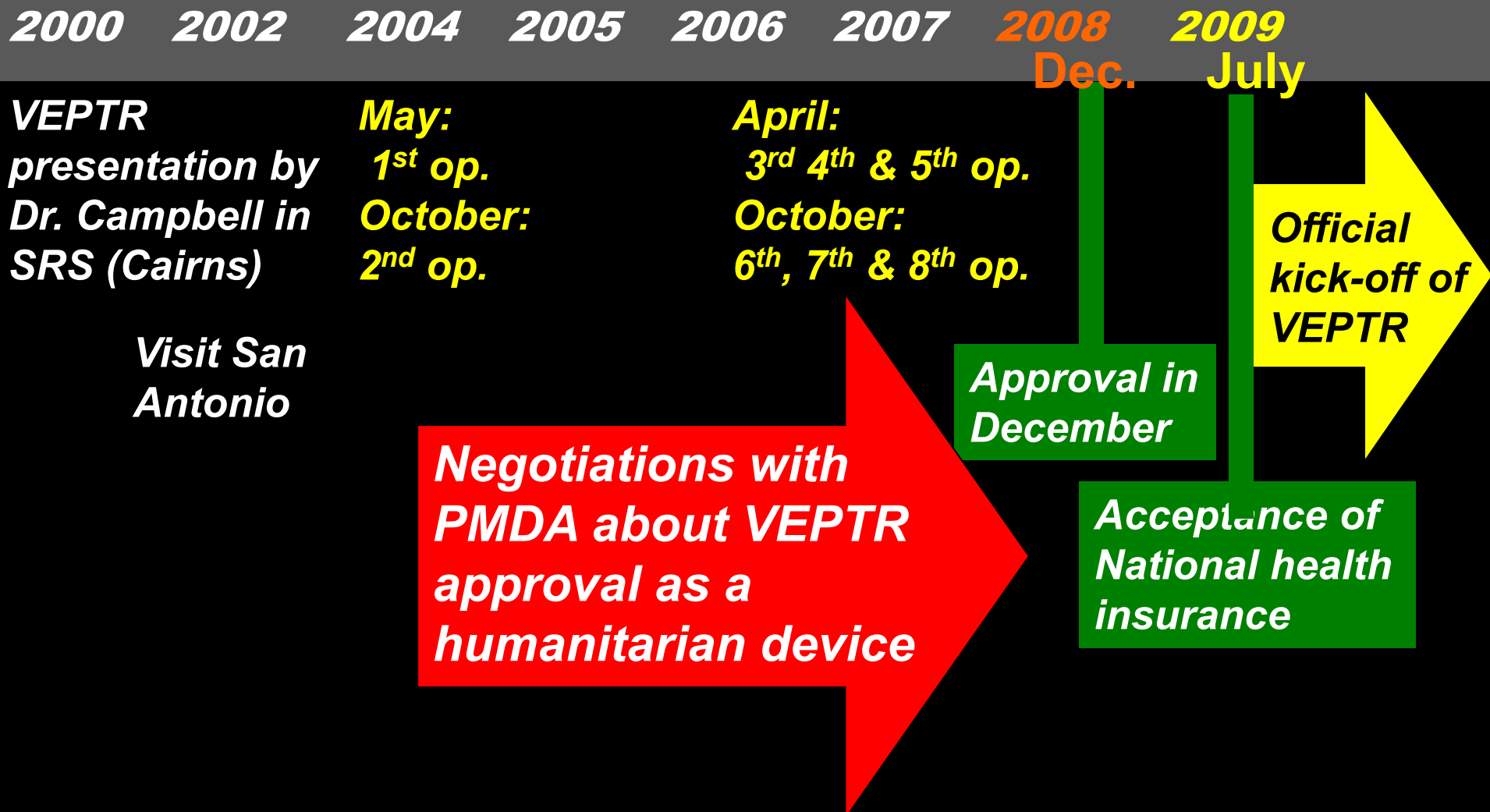
It is difficult to start VEPTR op. without guidance and supports from other departments.

Purpose

To report our learning curve of VEPTR operations and the experiences of the first 33 patients in Japan.



Chronological Table of VEPTR in Japan



Three Stages in VEPTR Operations

33 pts.

2004

2005

2006

2007

2008

2009
July

2010
Dec. June

May:
1st op.
October:
2nd op.

8
pts.

April:
3rd 4th & 5th op.
October:
6th, 7th & 8th op.

11
pts.

14
pts.

1st stage 8 pts. before approval
2nd stage 11 pts. first 6ms. after approval
3rd stage 14 pts. next 6ms.

Approval of
h
ance in

July

Demographic Data (N=33)

Sex	Male 10, Female 23
Age at op.	6.0 ± 1.5 y/o (3 ~ 8)
Height	$98,7 \pm 10.3$ cm (78 ~ 119)
BW	16.3 ± 7.9 Kg (11 ~ 35)
F/U period	1.4 ± 1.6 yrs. (0.3~ 6)

Dx	● Congenital scoliosis + rib anomalies	18	}
	● Myelomeningocele	6	
	● Spondylocostal Dysostosis	3	
	● SOTOS syndrome	2	
	● Others	4	

Classification of TIS in 33 pts, (Thoracic Volume - Depletion Deformities)

Primary	24
Type I (Absent ribs and scoliosis)	3
Type II (Fused ribs and scoliosis)	17
Type III (Foreshortened thorax)	4
Secondary	8
Acquired	1

Co-morbidities & Associated Abnormalities

Cleft palate

Inguinal hernia

TOF

Obstruction of duodenum

Op.
performed

Chronic Respiratory failure (HOT - 3)

Tethered spinal cord (Lipomeningocoele-2)

Previous Scoliosis Surgery (2)

Klippel-Feil Syndrome

Primary VEPTR Procedures

- Implantation

■ Unilateral implantation	26
■ Bilateral implantation	7
• One-staged	6
• Two-staged	1

- Types of VEPTR

■ Rib-to-rib	3
■ Rib-to-lumbar	24
■ Rib-to ilium	6

- Expansion thoracostomy

28

Expansion & Replacement

9 times: 1

7 times: 1 ( Final op. 1)

6 times: 4

5 times: 1

4 times; 1 ( Final op. 1)

2 times: 3

1 time : 6

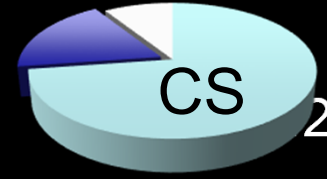
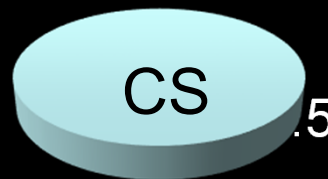
Expansion: 61 times,
Replacement: 6 pts

Comparisons of Operative Data

	All	1 st stage	2 nd stag	3re stage
Patients	33	8	11	14
EBL (ml)	60.4±57.4	102±51.5	79.0±66.0	
Op. time (mins)	167±50.4	197±51.7	177±47.5	
ICU stays (day)	6.3±5.3	10.9±7.7	4.0±2.9	
Preop. Cobb(°)	75.7±31.5	89.9±25.4	85.3±29.2	
Postop. Cobb(°)	52.2±25.8	71.9±29.4	56.4±17.4	

Diagnoses

Preop. SAL(%) 76.2±14.0
81.1±12.7



Postop. SAL(%) 84.6±15.0 79.0±12.8 86.9±12.4

Surgical Complications

21/33 (63.6%)

	1 st stage	2 nd stage	3 rd stage
Intraop.	2	1	2
	MEP drop-down Rib fracture	MEP drop-down	Atelectasis Rib fracture
Postop.	7/8	7/11	6/14
	87.5%	63.6%	42.9%

Postop. Complications in Each Stage

1st stage

Respiratory

- Pleural effusion
- Flail chest
- Atelectasis
- Vocal cord polyp

Implant-related

- Hook prominence
- VEPTR dislodgement

Skin

- Stitch abscess
- Skin slough

Neurological

- CSF leakage

Psychological

- ICU syndrome

2nd stage

Respiratory

- Hemothorax
- Pneumothorax
- Atelectasis

Implant-related

- S-hook migration
- Shoulder imbalance

Neurological

- CSF leakage
- Phrenic N paralysis

Skin

- Skin slough

3rd stage

Respiratory

- Atelectasis

Implant-related

- Shoulder imbalance

Skin

- Skin slough

Infection

- Deep infection
- UTI

Psychological

- ICU syndrome

Other

- Limited shoulder elevation

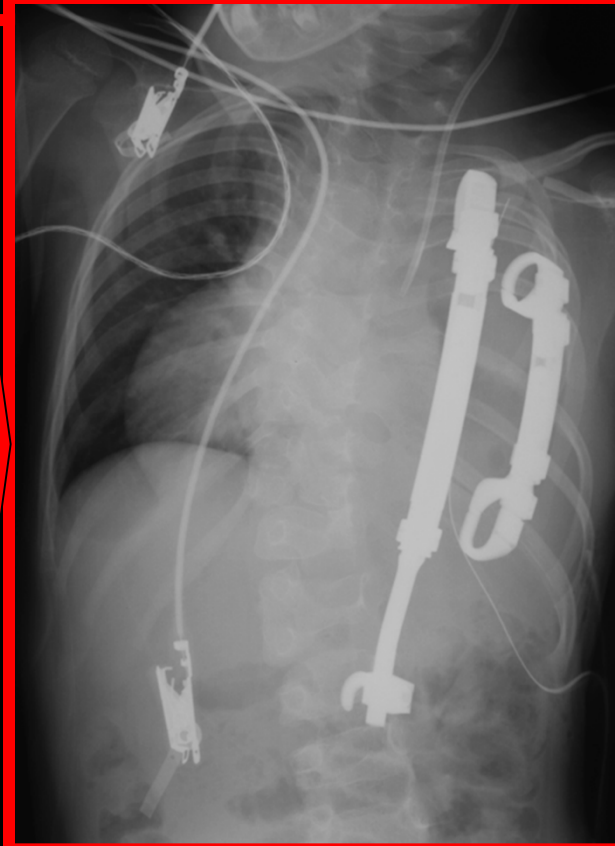
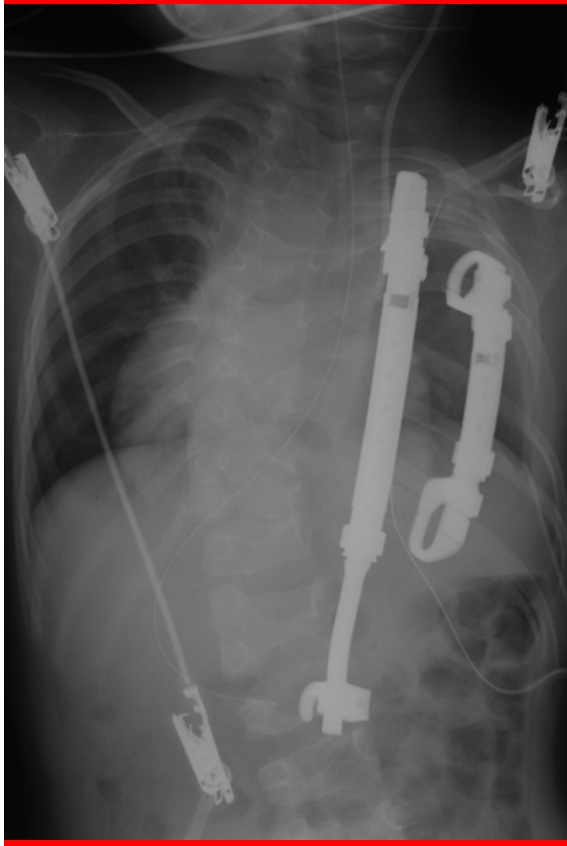
Respiratory Complications

■ 4+7 F. CS with FR
2nd stage,
Postop, Stay in ICU 7days

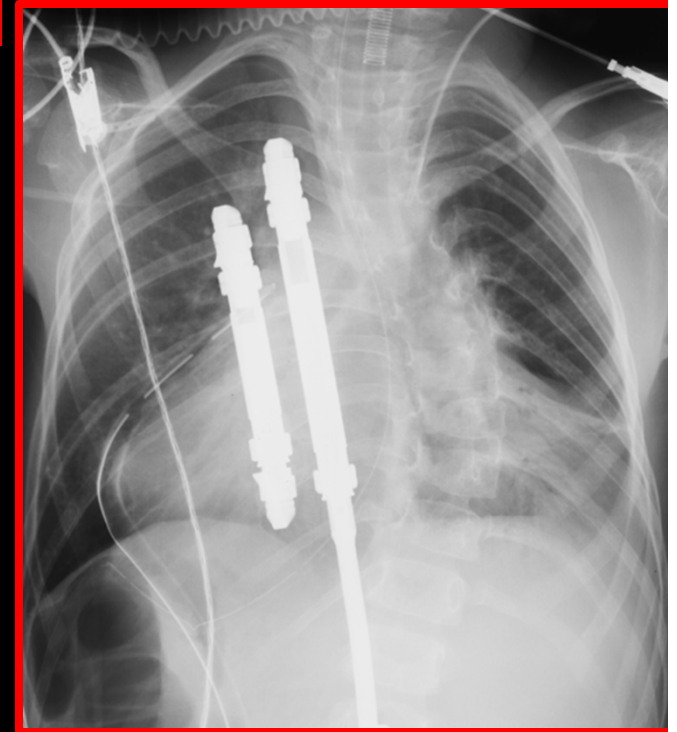
■ 5+7 M SOTOS syn.
3rd stage, Postop. Stay
in ICU 15 days.

Postop, Hemothorax

Immediately postop. Postop. 1st Day.



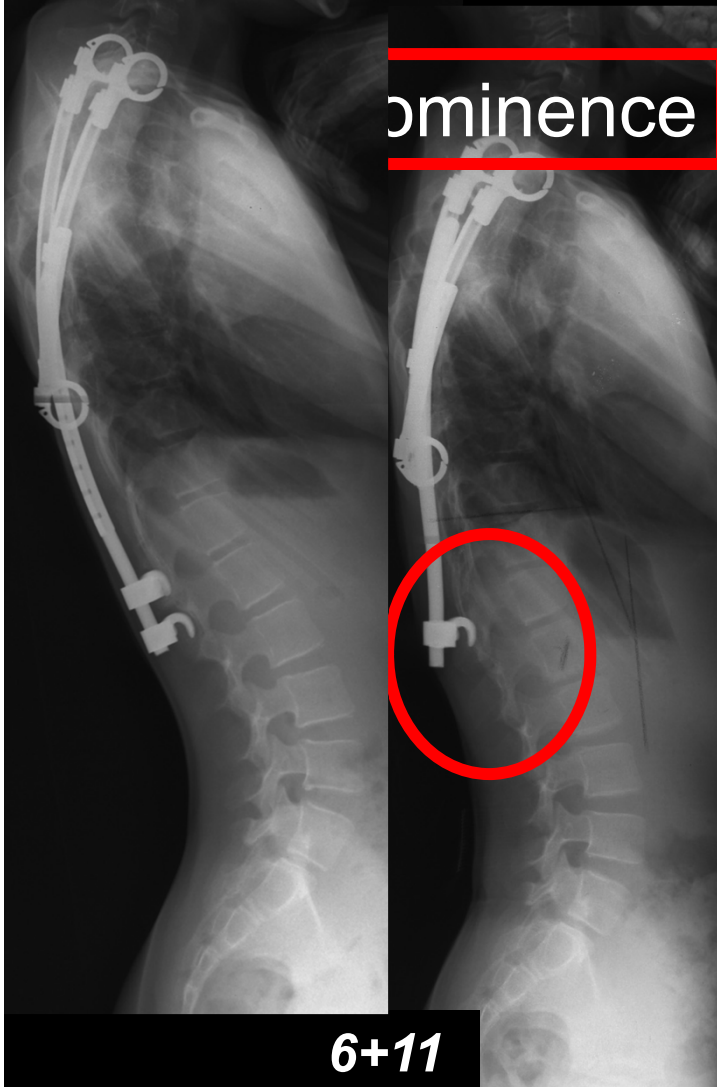
Postop,
Atelectasis



Device-Related Complications

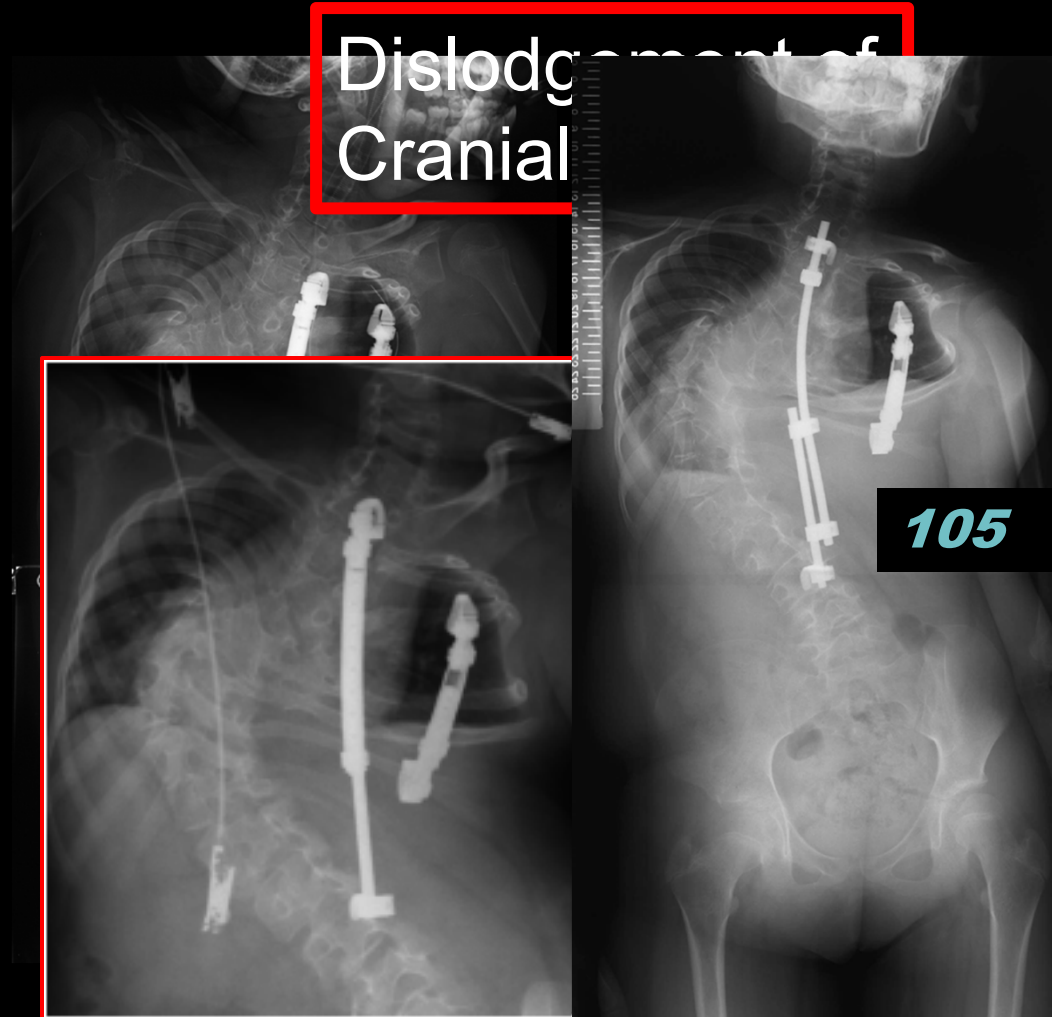
5+6 F CS with FR
1st stage,

Postop. Stay in ICU 3 days.



8+7 F CS with FR
1st stage,

Postop. Stay in ICU 20 days.



Conclusions

- **During the learning curve, it was possible to decrease the occurrence of perioperative complications, the operative time, and intraoperative blood loss.**
- **Because of high complication rates of VEPTR operations, it was necessary to advance step by step in order to decrease complication rates.**