

# Efficiency and Reliability of Ilio Sacral Screw in Fusionless Surgery for Neuromuscular Scoliosis Preliminary Results of 100 Patients

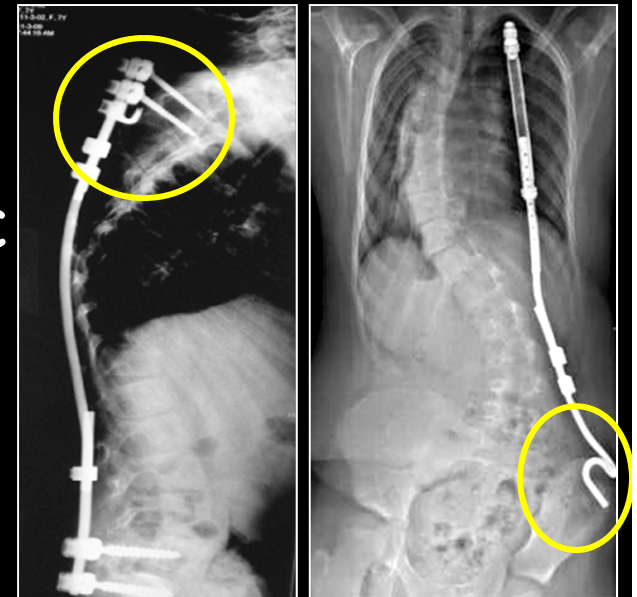
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Necker Hospital Paris (France)

# Disclosures

- L. Miladi      Euros (Other Financial Support)
- M. Gaume      No Relationship
- N. Khouri      No Relationship
- C. Glorion      No Relationship

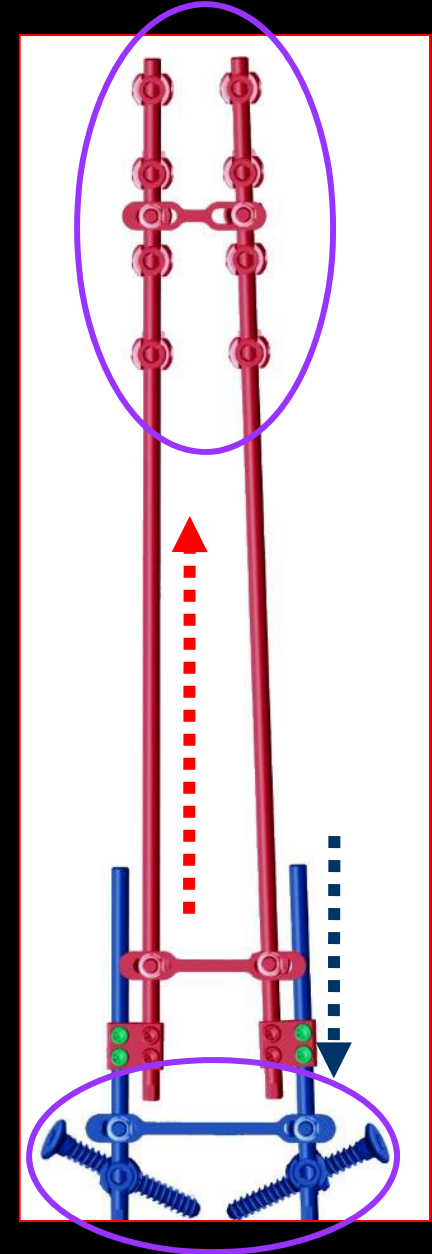
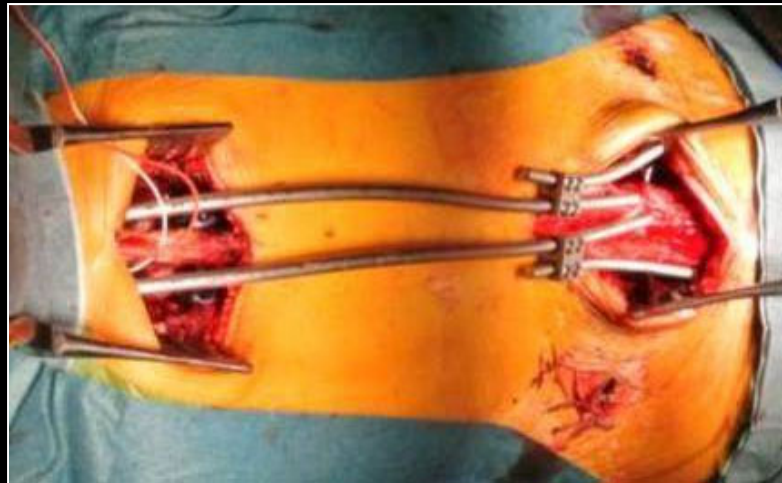
# Introduction

- Conservative treatment is not efficient in Neuromuscular Scoliosis
- Traditional fusionless surgery has many mechanical complications
- Is there an other type of pelvic fixation stronger than the one used in usual fusionless techniques ?



# Introduction

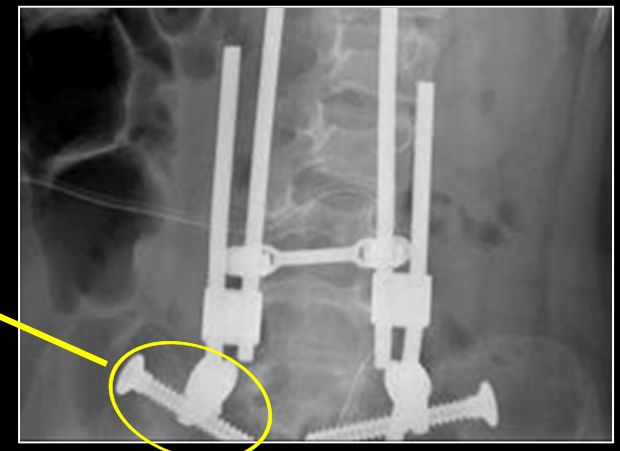
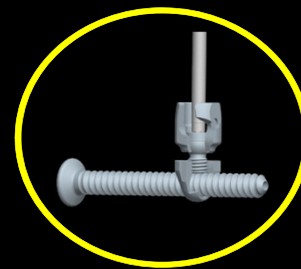
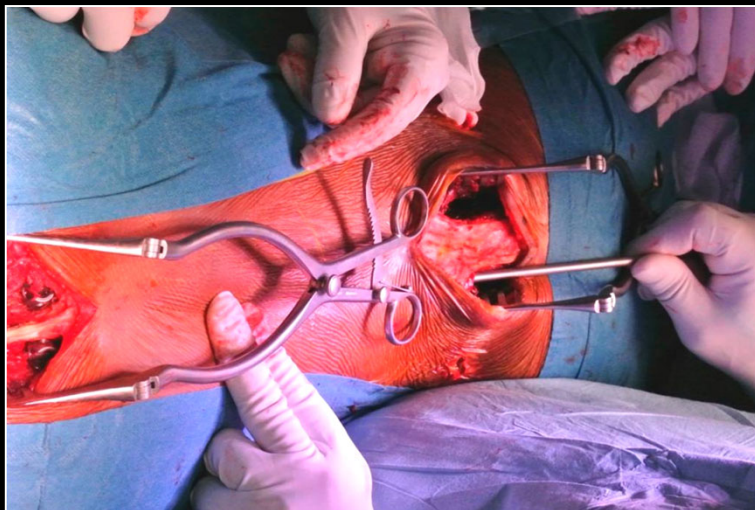
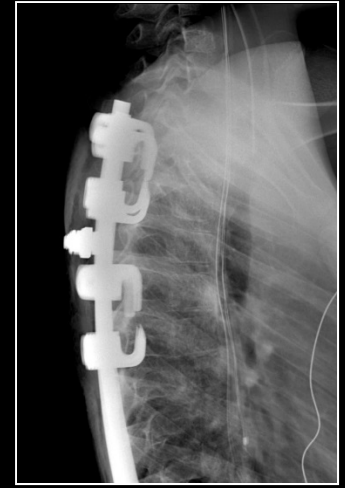
- Original concept based on:
  1. Bipolar strong fixation
  2. Progressive correction through telescopic construct
  3. Minimally invasive approach





# Material and methods

- 2 Short midline incisions
- Proximal fixation by 2 pedicle supralaminar **hooks claws** on each side
- Distal fixation by **ilio sacral screws**
- Rod lengthening (~18 months)



# Material and methods

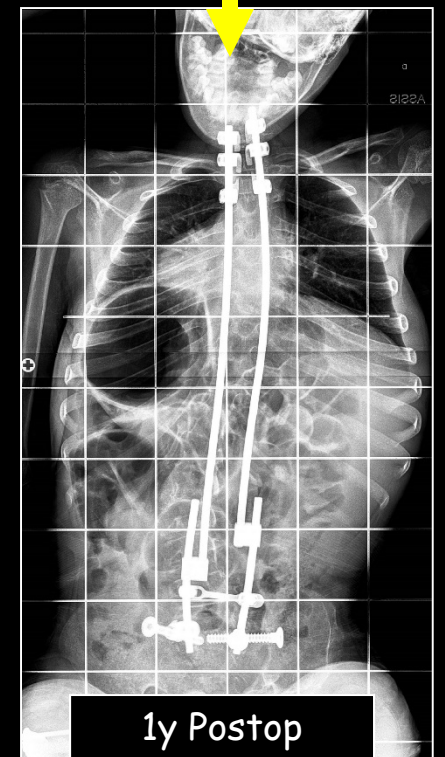
Retrospective study :

- 100 consecutive patients, 58M + 42F
- 58 CP, 22 SMA, 10 MD, 7 others neuro
- Mean age at surgery : 11+6y
- Mean FU : 2+7y (1y to 5+9y)



# Results

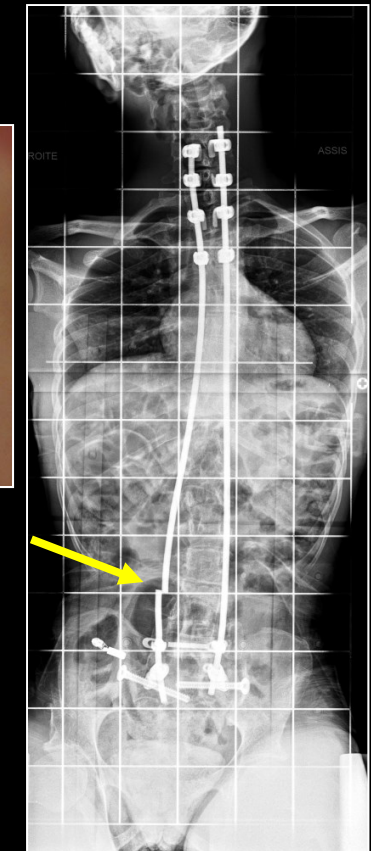
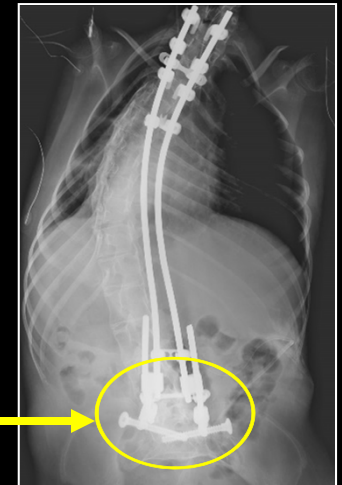
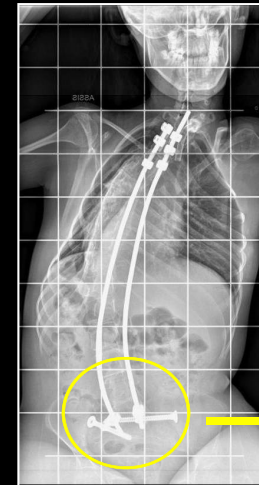
- Cobb angle correction
  - Pre-operative :  $88.66^{\circ}$  ( $25^{\circ}$ - $149^{\circ}$ )
  - Final follow-up :  $34.88^{\circ}$  ( $5.6^{\circ}$ - $52.62^{\circ}$ )  
⇒ **61%**
- Pelvic obliquity correction
  - Pre-operative :  $28.44^{\circ}$  ( $0^{\circ}$ - $79.50^{\circ}$ )
  - Final follow-up :  $4.78^{\circ}$  ( $-5.11^{\circ}$ - $21.90^{\circ}$ )  
⇒ **83%**



# Results

- Complications : **26%** overall
  - Infections : **16** (5 wound + 11 superficial)
  - Mechanical : **12** (1 rod fracture, 5 cases of screw misplacement )
  - Digestive : 2
  - Pulmonary : 2

- 24 Unplanned surgeries
- **14 SSEP alerts** without PO deficit
- **No screw fracture or migration**
- **No conversion into arthrodesis**



# Discussion

## For Neuromuscular Scoliosis:

Authors	Year	Technique	Nb	Cobb (%)	Pelvic obliquity (%)	Overall complication rate (%)	Mechanical complications (%)	Infections (%)
Lonstein	2012	Arthrodesis	93	50	-	58	-	-
Abol	2014	VEPTR	20	24	43	45%	12/20	3/20
Sponseller	2009	Growing rods	36	55	40	44%	11/36	5/36
<b>Our series</b>	<b>2016</b>	<b>MIS-technique</b>	<b>100</b>	<b>61</b>	<b>83</b>	<b>26%</b>	<b>12/100</b>	<b>16/100</b>

**Lonstein** JE, Koop SE, Novachek TF. Results and complications after spinal fusion for neuromuscular scoliosis in cerebral palsy and static encephalopathy using Luque Galveston instrumentation: experience in 93 patients. Spine. 2012 Apr 1; 37(7): 583-91

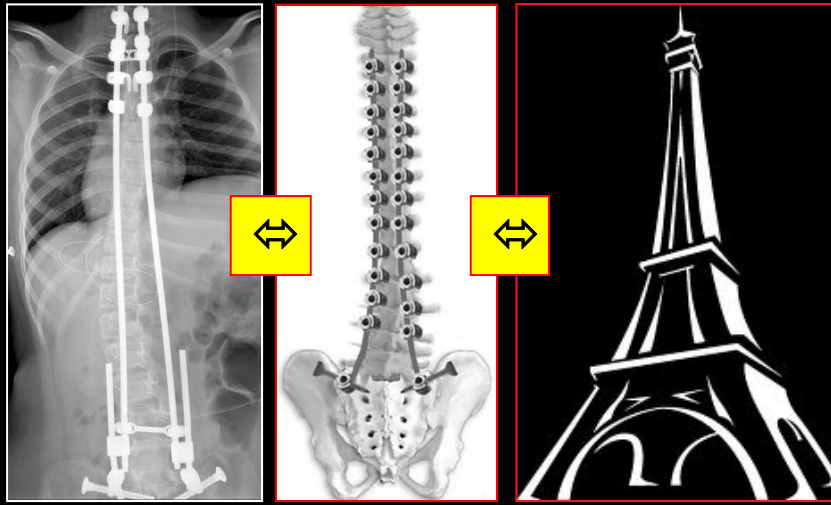
**Abol** O, Stuecker R. Bilateral rib to pelvis Eiffel tower VEPTR construct for children with neuromuscular scoliosis: a preliminary report. Spine J. 2014 Jul 1 ;14(7):1183-91

**Sponseller** PD, Yang JS, Thompson GH. Pelvic fixation of growing rods Comparison of constructs. Spine. 2009 Jul 15;34(16):1706-10



# Discussion

The construct is:

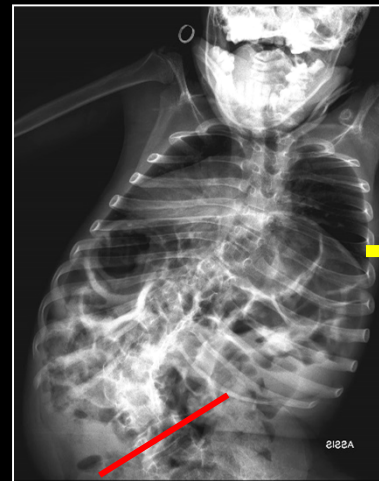


→ Stable

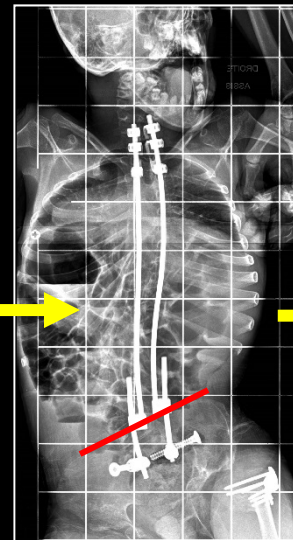


→ Resistant

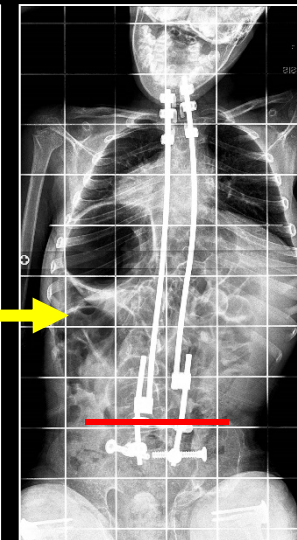
→ Evolutive



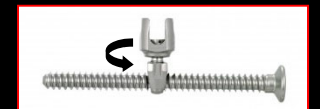
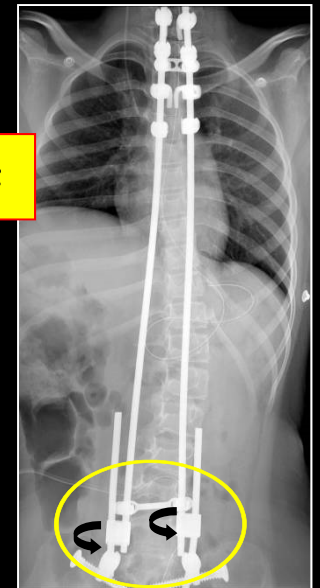
Initial



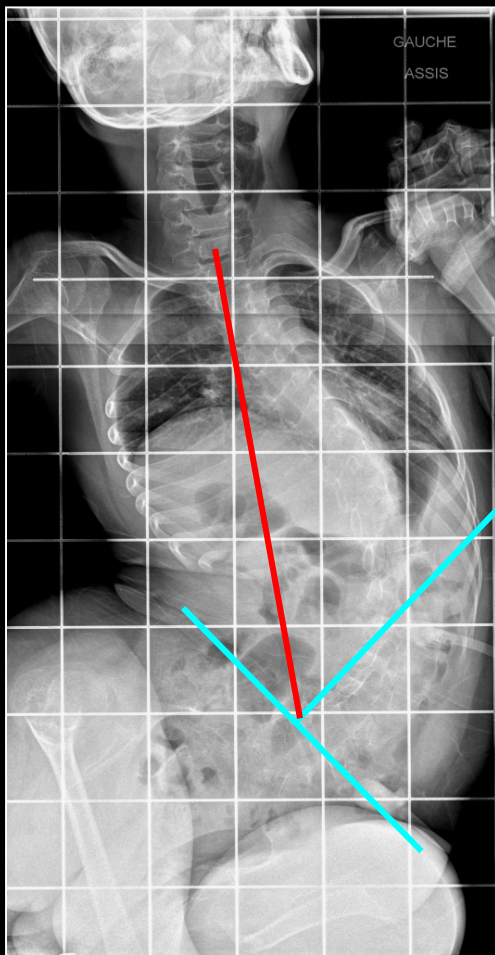
Pre RL



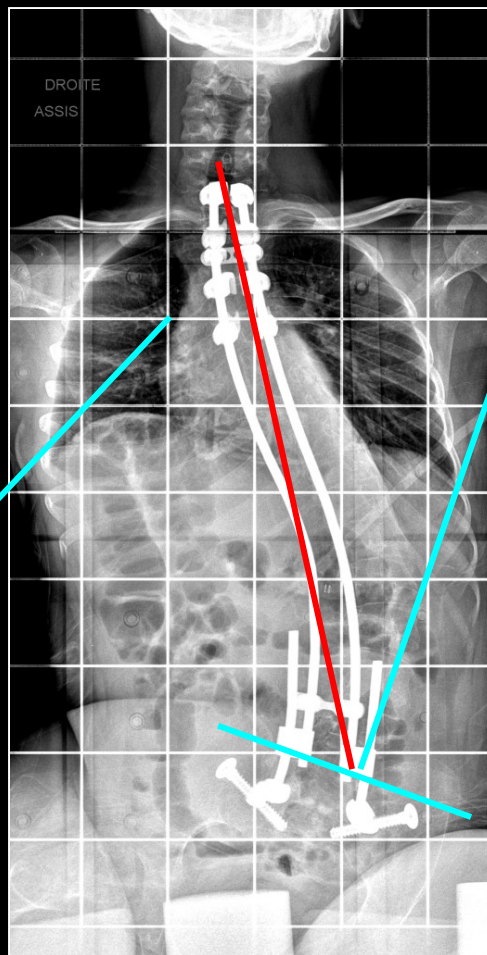
Post RL



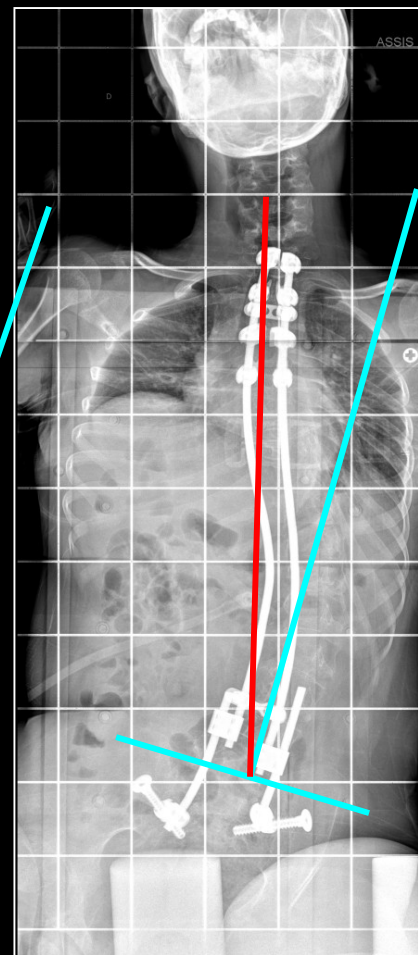
# Case 1 ( CP, 14y )



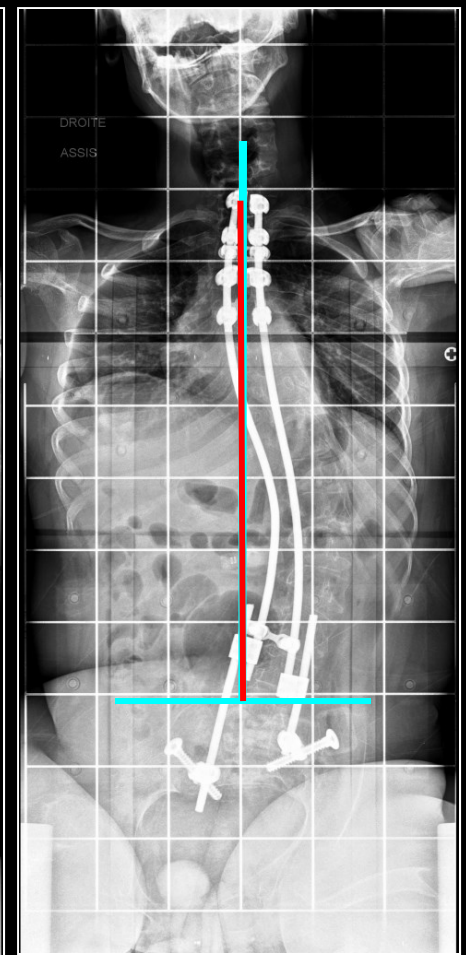
Initial



PO



10m PO (Post RL1)



24m PO (Post RL2)



# Case 1 ( CP )



Initial



PO



10m PO (Post RL1)



24m PO (Post RL2)

# Case 1 (CP)



Initial



10m PO (Post RL1)



24m PO (Post RL2)



# Case 1 (CP)



Initial

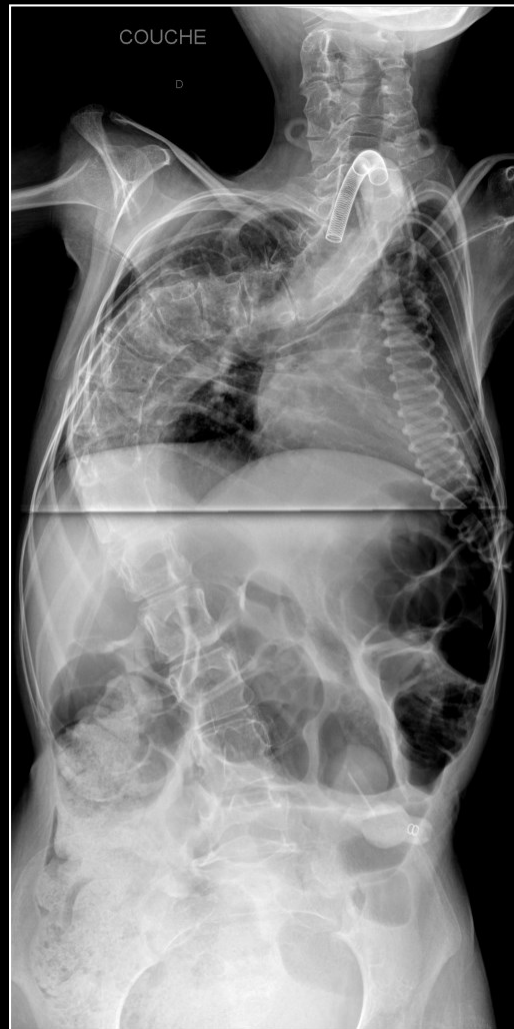


10m PO (Post RL1)

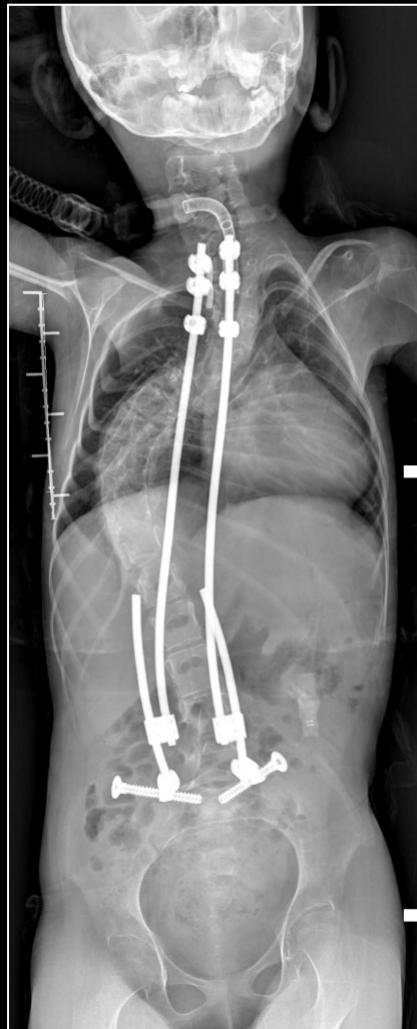


24m PO (Post RL2)

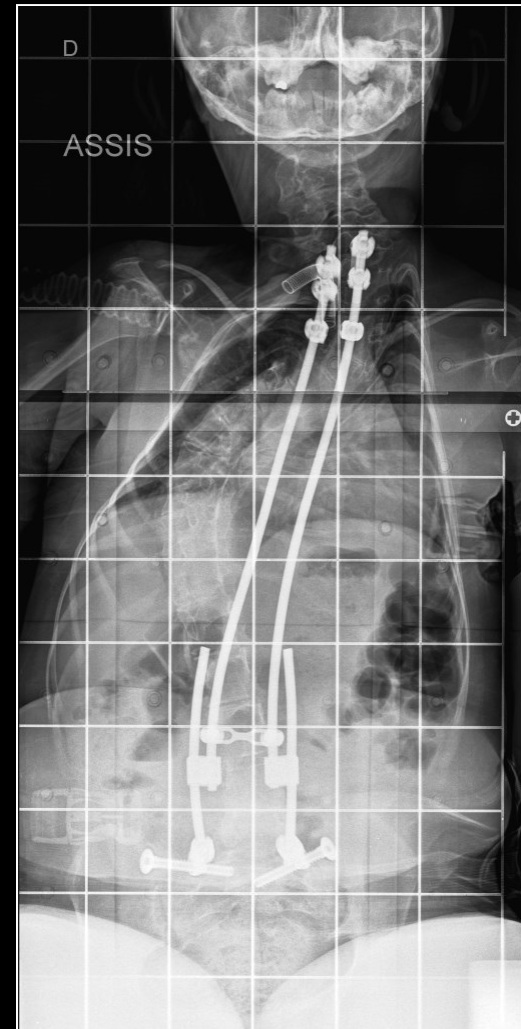
# Case 2 (Ulrich Sd 11a)



Initial



PO



24m PO (Post RL1)

# Case 2 (Ulrich Sd 11a)



Initial



PO



24m PO (Post RL1)



# Case 2 (U



22Kg

Initial



1y PO



48Kg

3y PO



# Case 2 (UI)



Initial



1y PO



3y PO

1



# Conclusion

- Thanks to its biomechanical qualities the ilio sacral screw pelvic fixation allows :
  - A **strong and stable construct** with a good final result
  - A **lower rate** of mechanical complications
  - **The avoidance of arthrodesis** for NMS

