

# Who is my ideal patient for MGCR



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# Disclosures

- Ellipse Technologies
  - Research Support



# My ideal case

- Patient factors
- Disease factors
- Surgeon factors
  
- My ideal case...



# Patient Factors

- **Age**
- **Size**
  - **Big enough for the implant**
  - **Height**
  - **Body habitus**
  - **Weight**
- **Social circumstances**
- **Calm and can keep still**



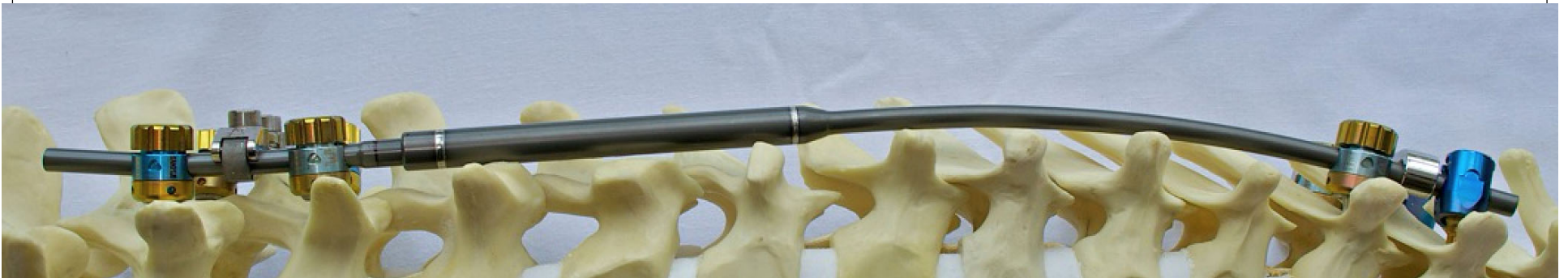
# Patient Factors

- **Age**
- **Size**
  - Big enough for the implant
  - Height
  - Body habitus
  - Weight
- **Social circumstances**
- **Calm and can keep still**
- **5-7yrs (*skeletal age*)**

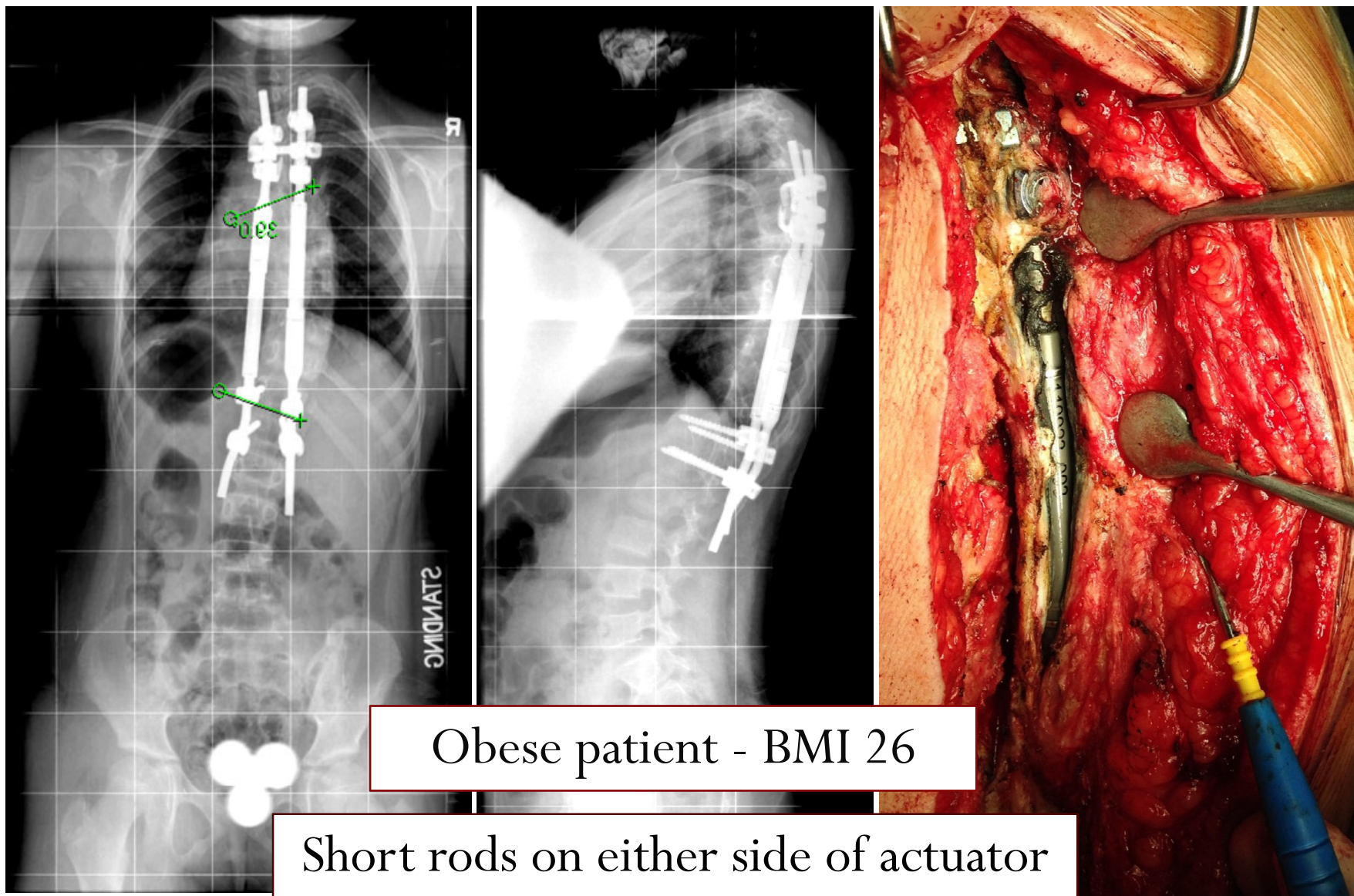


# Patient Factors

- Age
- Size
  - Height / big enough for the implant
  - Body habitus
  - Weight
- Size
  - Actuator + 5cm both sides
  - Thickness of subcut fat
  - Weight limit?
  - BMI a good surrogate?



# Failure to distract Dec 2011 – immediately after surgery



# Patient Factors

- Age
- Size
  - Big enough for the implant
  - Height
  - Body habitus
  - Weight
- **Social circumstances**
- Calm and can keep still
- Willingness to return for distractions
  - Standard (monthly)
  - Rarely (3 monthly)
  - Few (weekly)





# Patient Factors

- Age
- Size
  - Big enough for the implant
  - Height
  - Body habitus
  - Weight
- Social circumstances
- **Calm and can keep still**
- **Ease of distraction**



# Disease factors

- **Diagnosis**
  - **Congenital**
    - Spine
    - Chest Wall
  - **Idiopathic**
  - **Neuromuscular**
  - **Syndromal**
  - **Conversions from traditional growing rods**



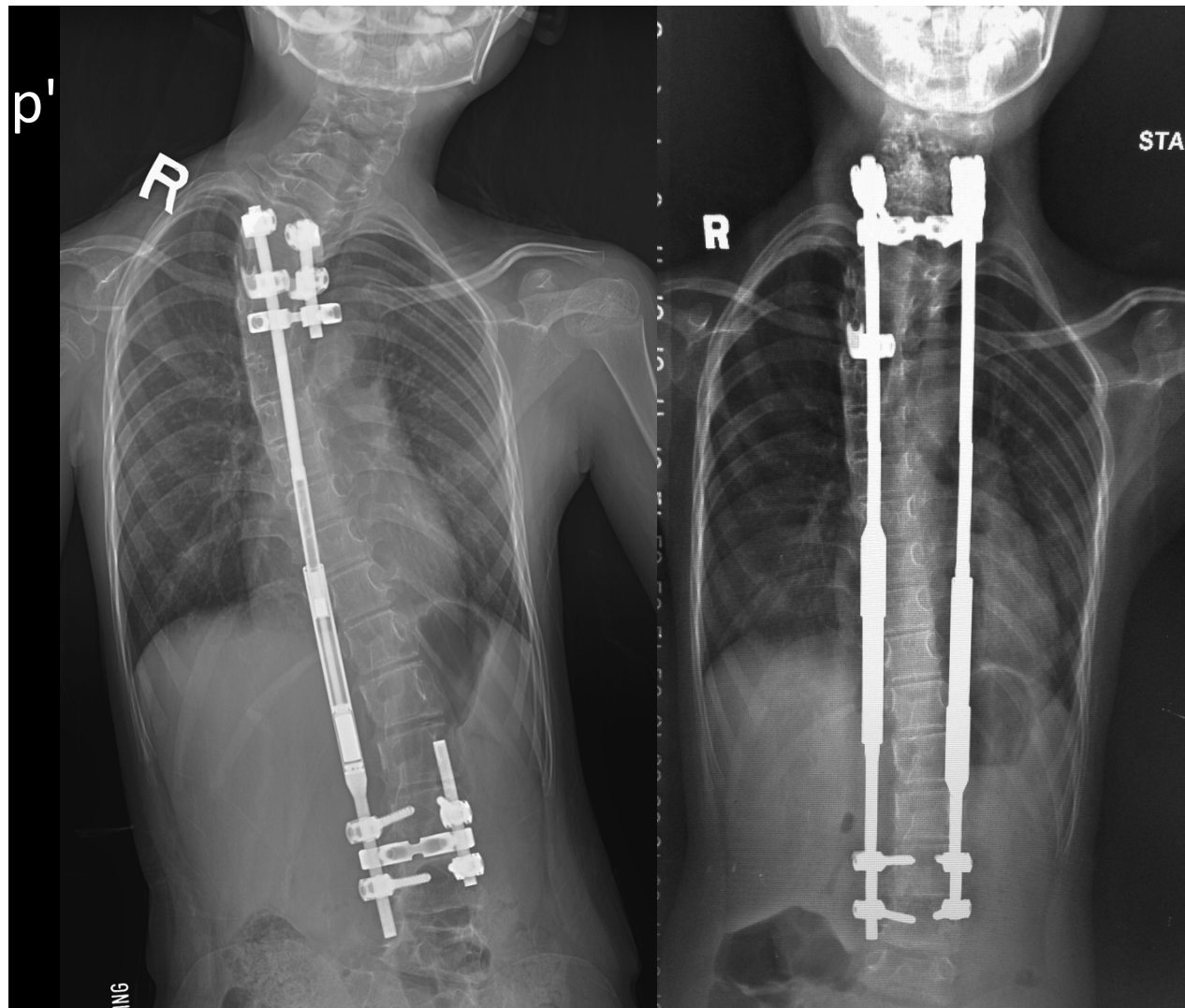
# Disease factors

- **Diagnosis**
  - **Congenital**
    - Spine
    - Chest Wall
  - **Idiopathic**
  - **Neuromuscular**
  - **Syndromal**
  - **Conversions from traditional growing rods**

**Flexible curves**  
**Ligamentously lax**



5 yo Ehlers Danlos  
7 Year FU – conversion to dual rods



# Surgeon factors

- **Understanding of the design of the actuator**
  - **Directionality (standard vs offset)**
- **Maximize distraction force**
  - **Technical aspects of distraction**
    - **Single versus 2 magnet technique**
    - **Alternating rod distraction technique**
  - **The “wobble” of a good distraction**
  - **The “clunk” of failures to distract**
- **Ability to monitor distractions**
  - **Low/zero radiation : EOS vs ultrasound**





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THE  
SPINE  
JOURNAL

### Clinical Study

## Reducing radiation exposure in early-onset scoliosis surgery patients: novel use of ultrasonography to measure lengthening in magnetically-controlled growing rods

Oliver M. Stokes, MBBS, MSc, FRCS (Tr&Orth),

Elizabeth J. O'Donovan, MBBS, BSc, MRCS, FRCR, Dino Samartzis, DSc,

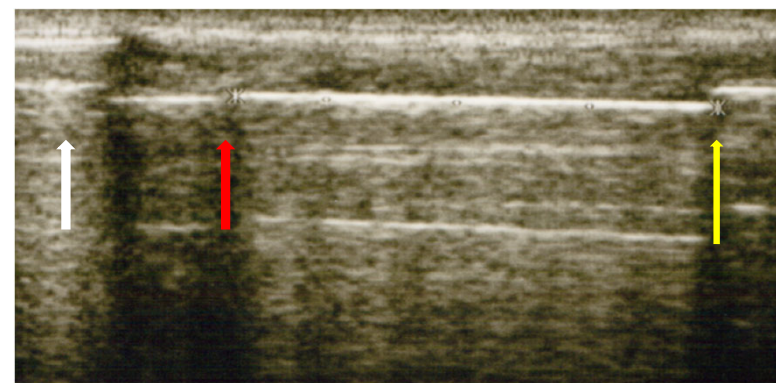
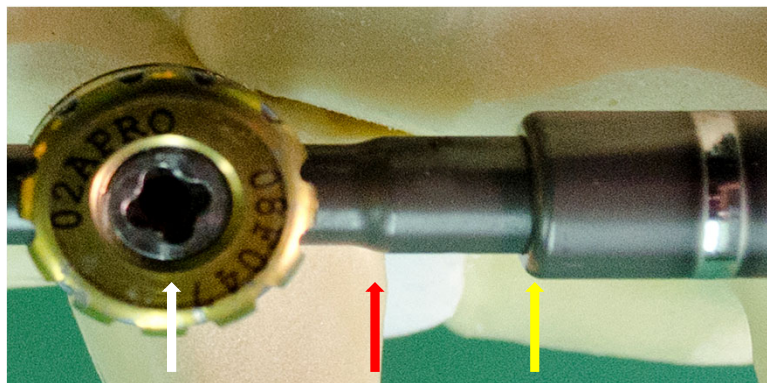
Cora H. Bow, MCMSc, BHS,

Keith D.K. Luk, MCh (Orth), MBBS, FRCSE, FRCSG, FRACS, FHKAM (Orth),

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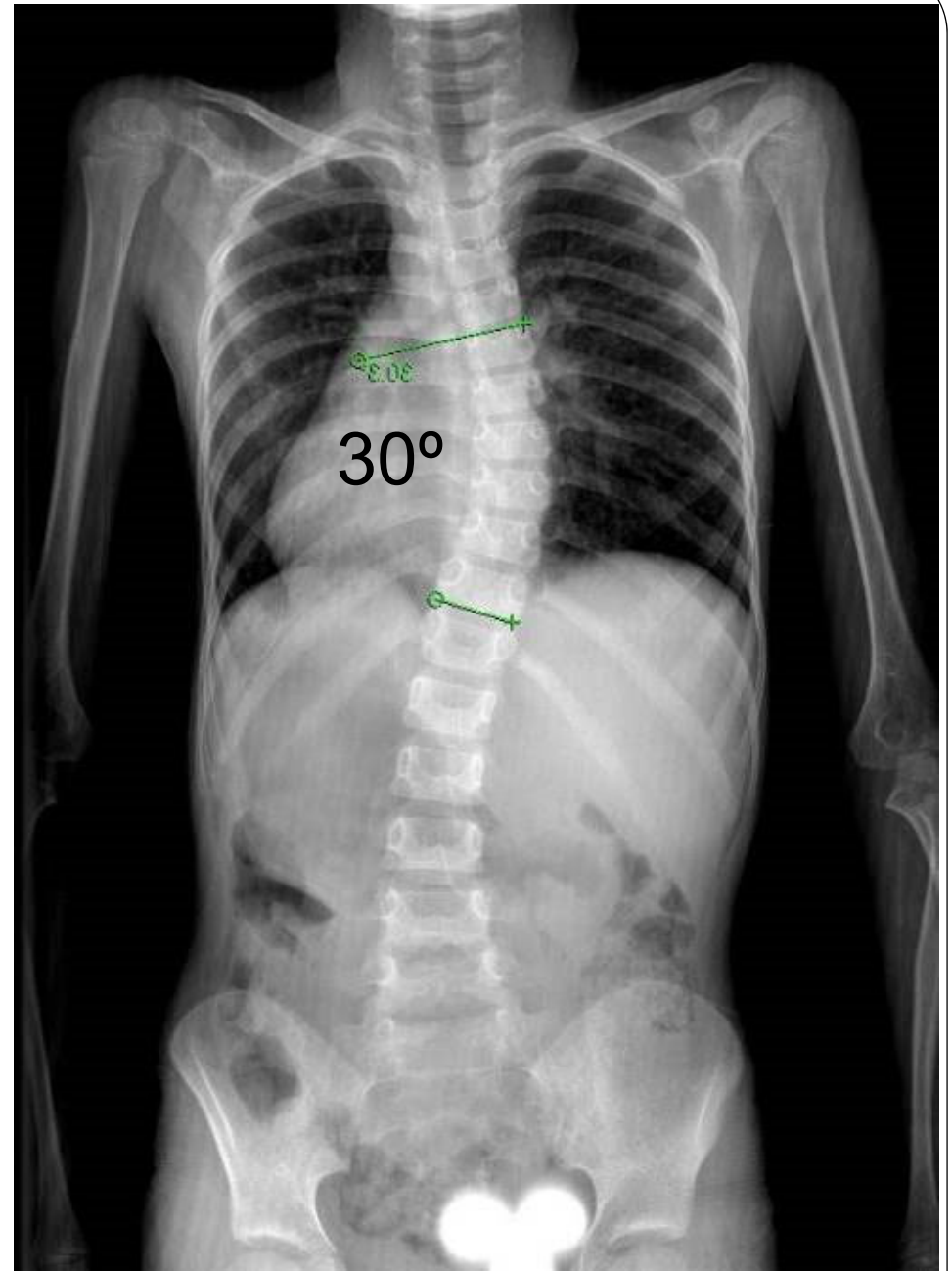
Department of Orthopaedics and Traumatology, The University of Hong Kong

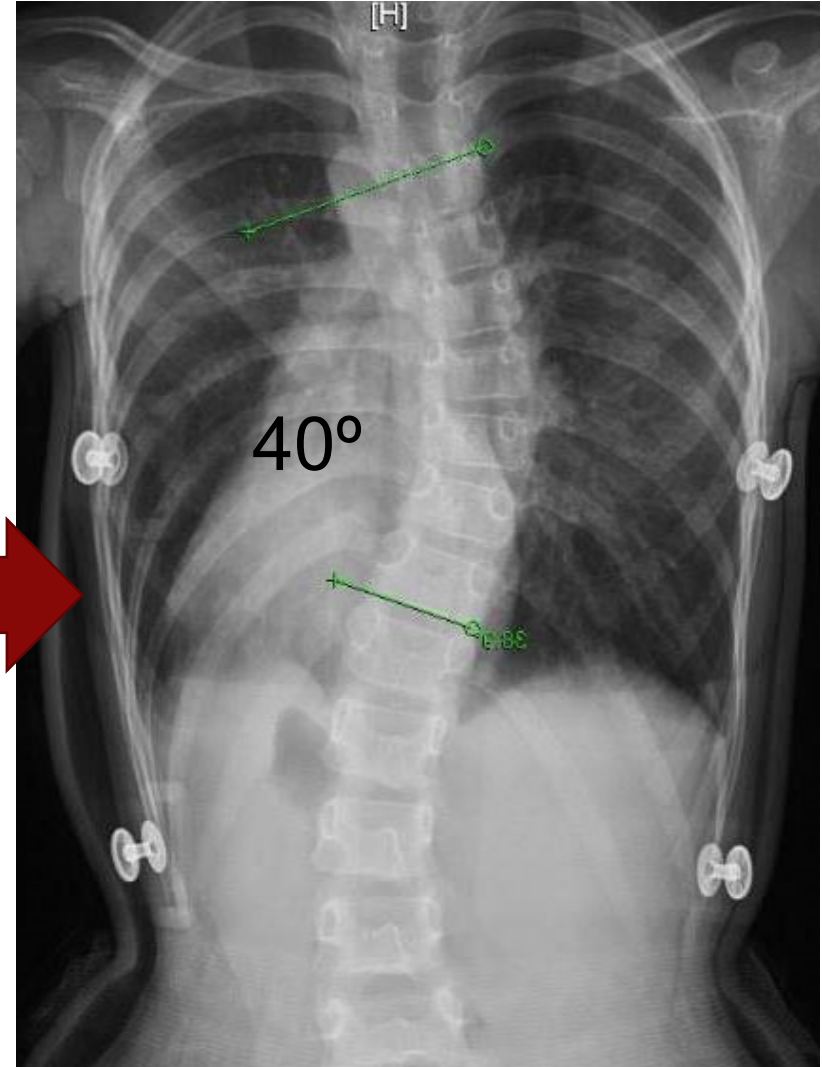
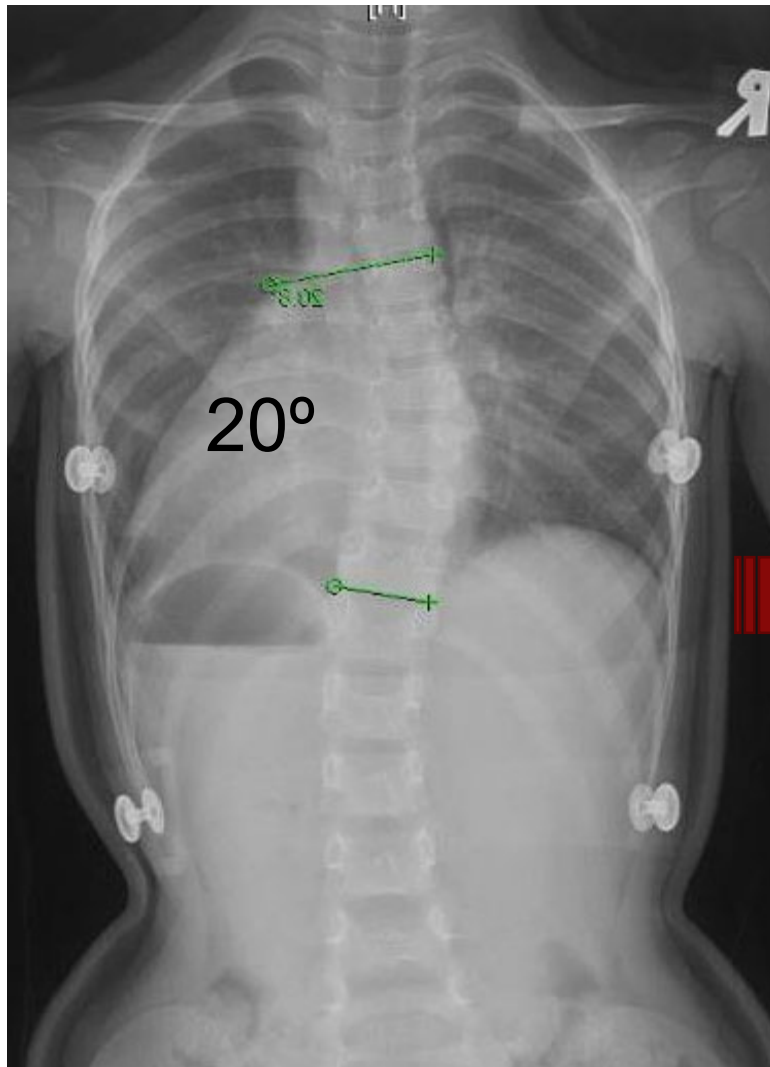
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# Case example

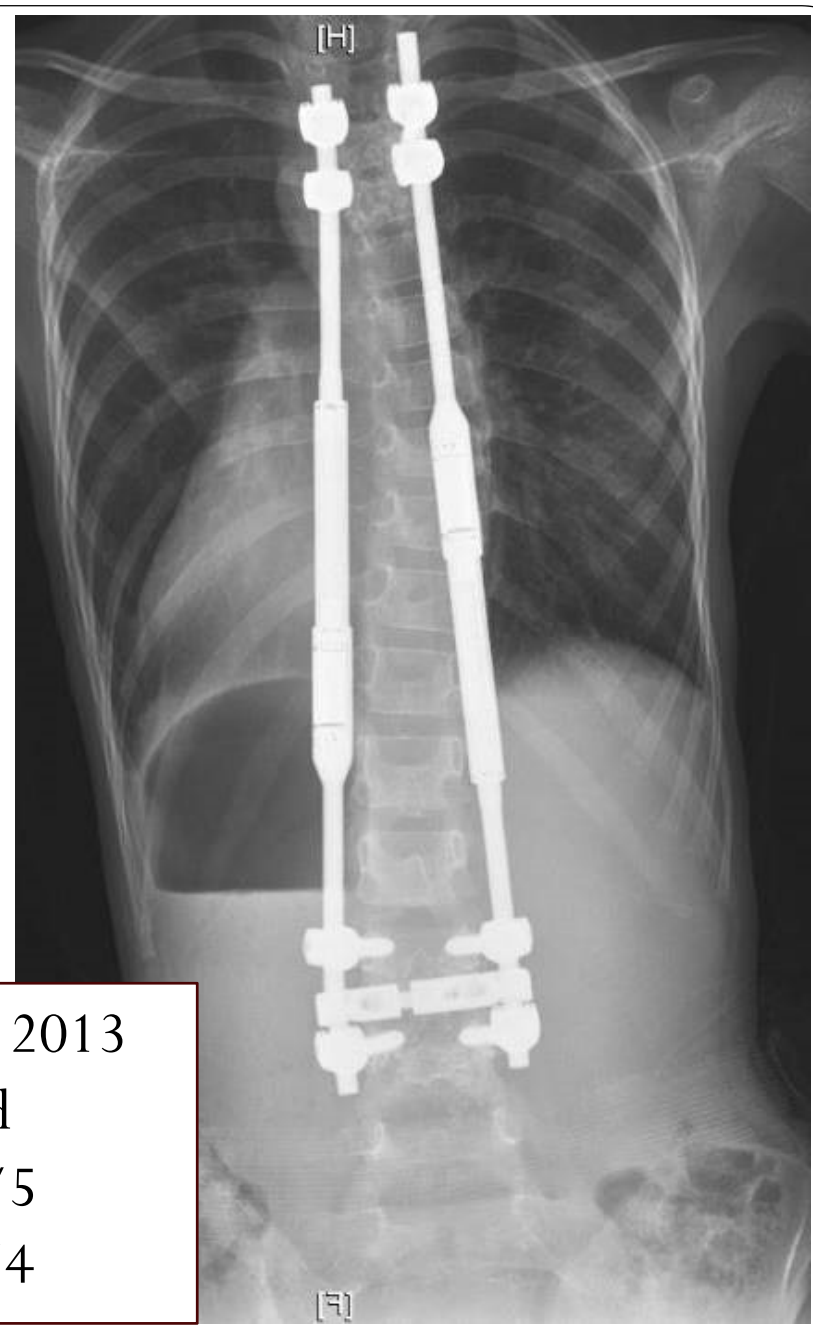
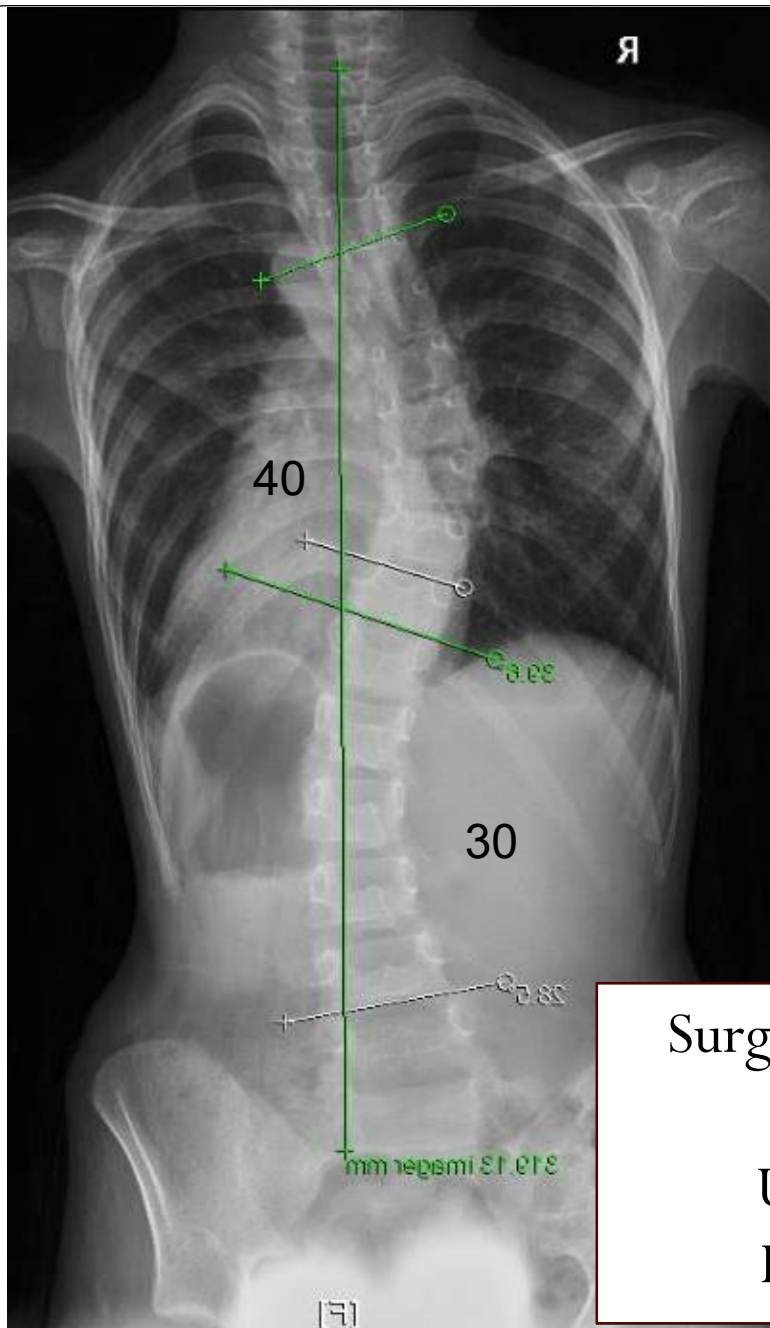
- First seen age 5 years old
- Marfanoid features
- Beighton score 8/9





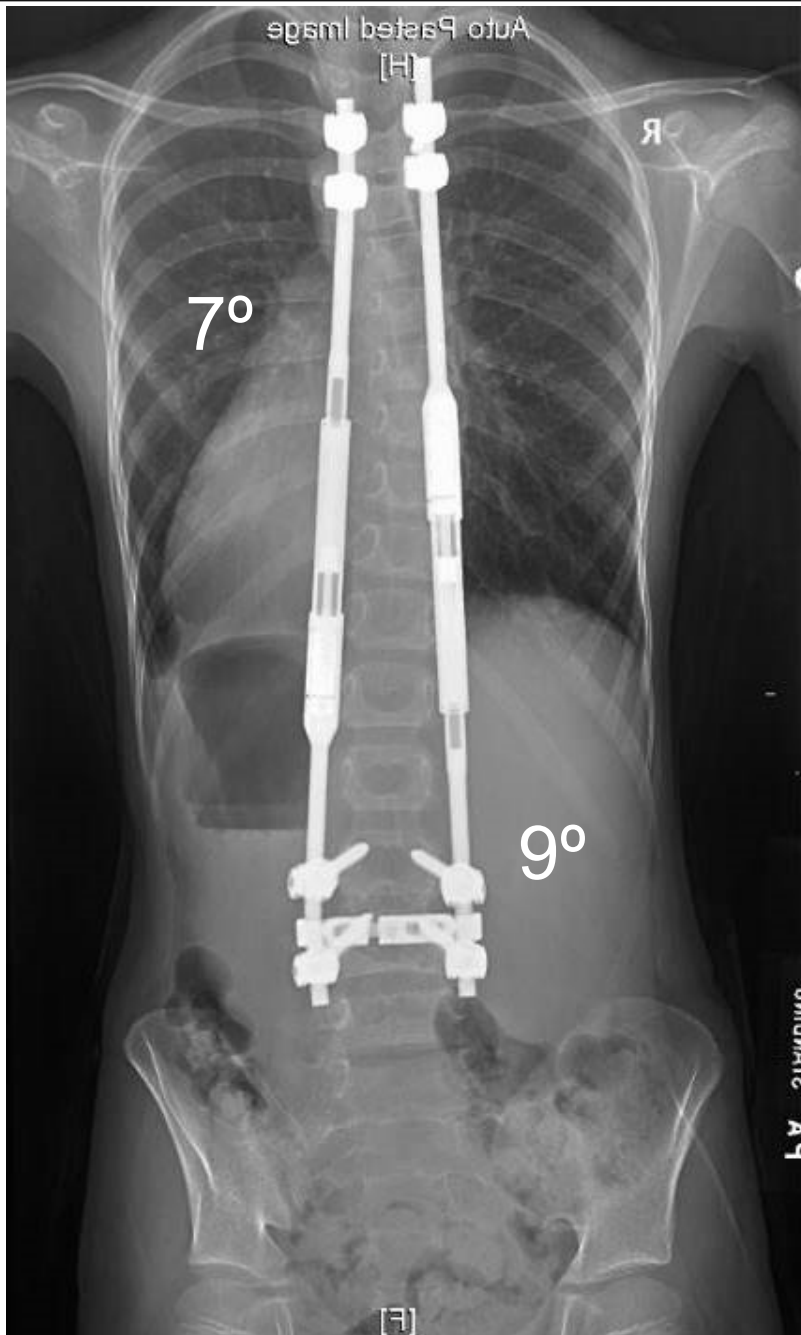
**Deterioration despite good compliance to bracing  
MRI was normal except for a low lying cord at L2**





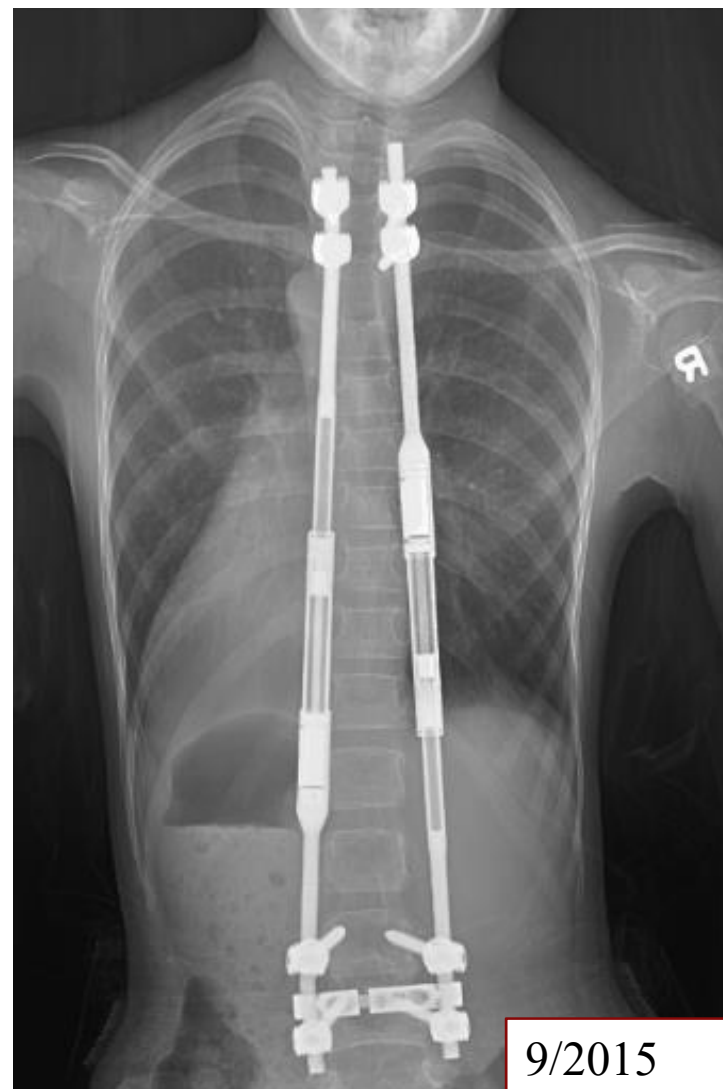
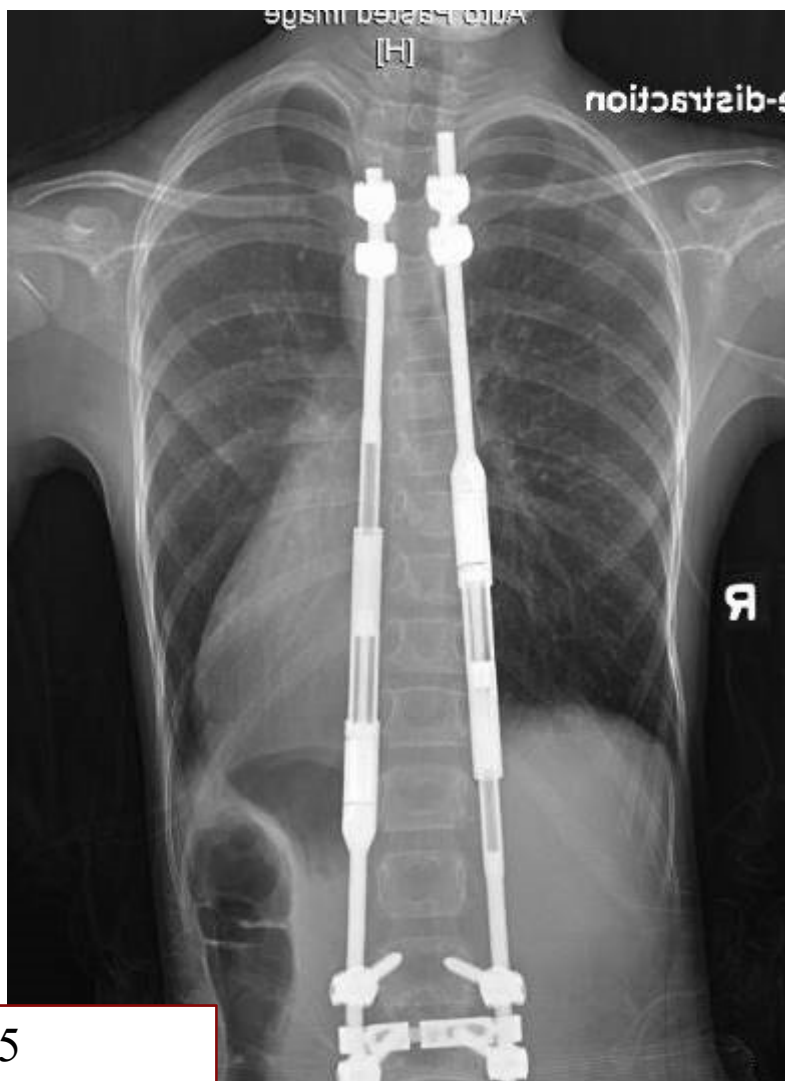
Surgery Dec 2013  
7yrs old  
UIV: T4/5  
LIV: L3/4





- Aug 2014
  - Postop 8 months
  - 2mm per month
- Ultrasound monitoring
- Smooth distractions
- Radiographs 6 monthly or if clinically indicated
  
- 7<sup>th</sup> distraction visit
- Distracted length:
  - R: 13.4mm
  - L: 13.8mm





3/2015

14<sup>th</sup> distraction  
R: 25.4mm  
L: 28.2mm

Differential distraction  
leading to / correct shoulder tilt

9/2015

20<sup>th</sup> distraction  
R: 36.5mm  
L: 42mm



# Progress

- Thin child, needs single magnet technique
- Started clunking on right rod at 15-16<sup>th</sup> distraction
- Plan for rod exchange Dec 2015



# My ideal case

- Patient factors
- Disease factors
- Surgeon factors
  
- My ideal case

**Age 5-7 yrs**

**Slim build**

**Flexible**

**Cooperative**

**Moderate progressive curve**



# The University of Hong Kong

