

# Night time detorsion brace for the treatment of idiopathic scoliosis in children under 6 years old

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# Disclosures

B Ilharreborde: ZimmerSpine (a), Biospace (a)

S Moreau: none

K Mazda: ZimmerSpine (a), Biospace (a)

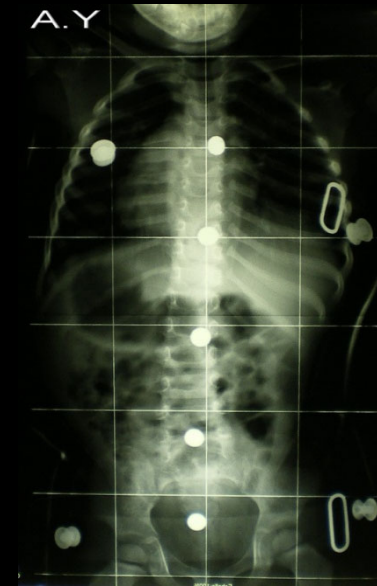
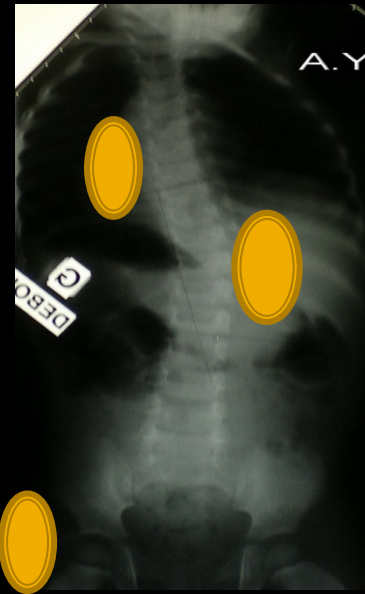
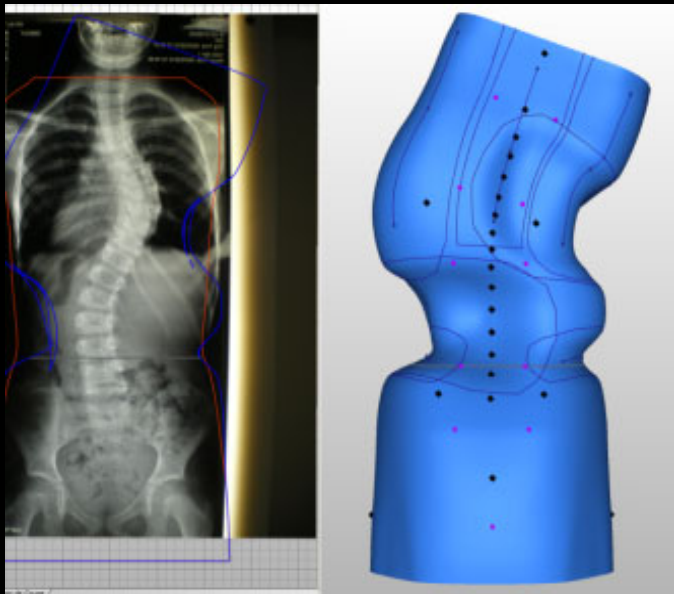
a: consultant

# Introduction

- Early onset scoliosis: **bad prognosis**
- Gold standard for conservative treatment in children <6 years old: Milwaukee and EDF casts  
(Mehta JBJS 2005; Sanders JPO 2009)
- Night time detorsion brace (CDN) is efficient in AIS  
(Mazda et al. SOFCOT 2007, Submission Spine)
- **Goal of the study:** evaluate the efficacy of CDN in children under 6 years old

# Materials and methods

- Retrospective study (1996-2010)
- Inclusion criteria: **SRS Committee** (Spine 2005)
- Charleston brace principle: **bending**
- Maximal correction in the **frontal plane**: Bending + « pads » applied on apical vertebrae

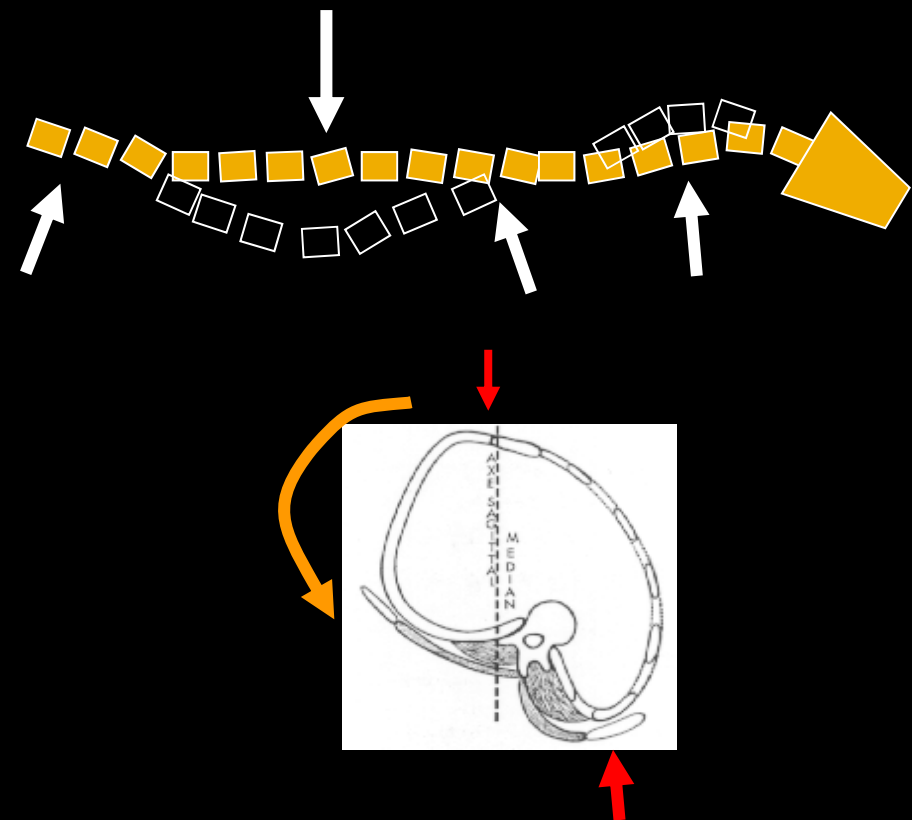


# Materials and methods

- Gravity: corrective action in the **sagittal plane** (supine)



- Detorsion effect in the **axial plane**



=> 3D correction

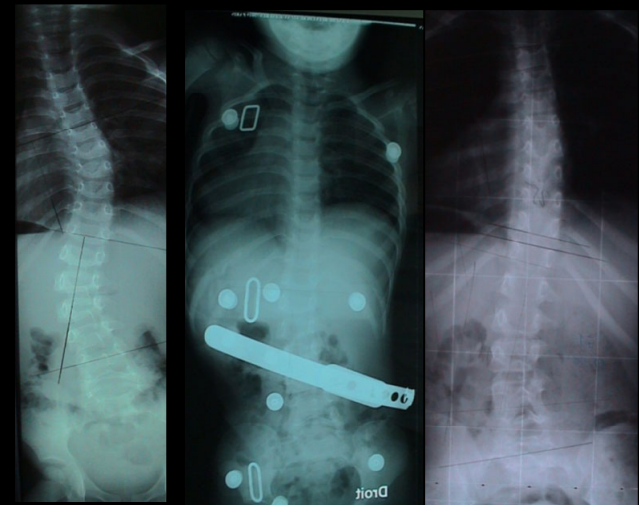
# Materials and methods

- Radiological analysis: EOS
- SRS criteria:
  - Success: main curve evolution  $< 5^\circ$
  - Intermediate: evolution  $> 5^\circ$  but  $< 45^\circ$
  - Failure:
    - Main curve  $> 45^\circ$
    - Change of orthopedic treatment
    - Surgery
    - Lost to follow-up



# Results

- 33 patients included (12 boys/21 girls)
- Mean age at brace initiation: 45 months (+/-20)
- Mean follow-up: 118 months (+/-30)
- At Last FU: 13 patients (39.4%) still Braced  
5 (15.1%) under observation  
15 (45.5%) reached skeletal maturity



# Results

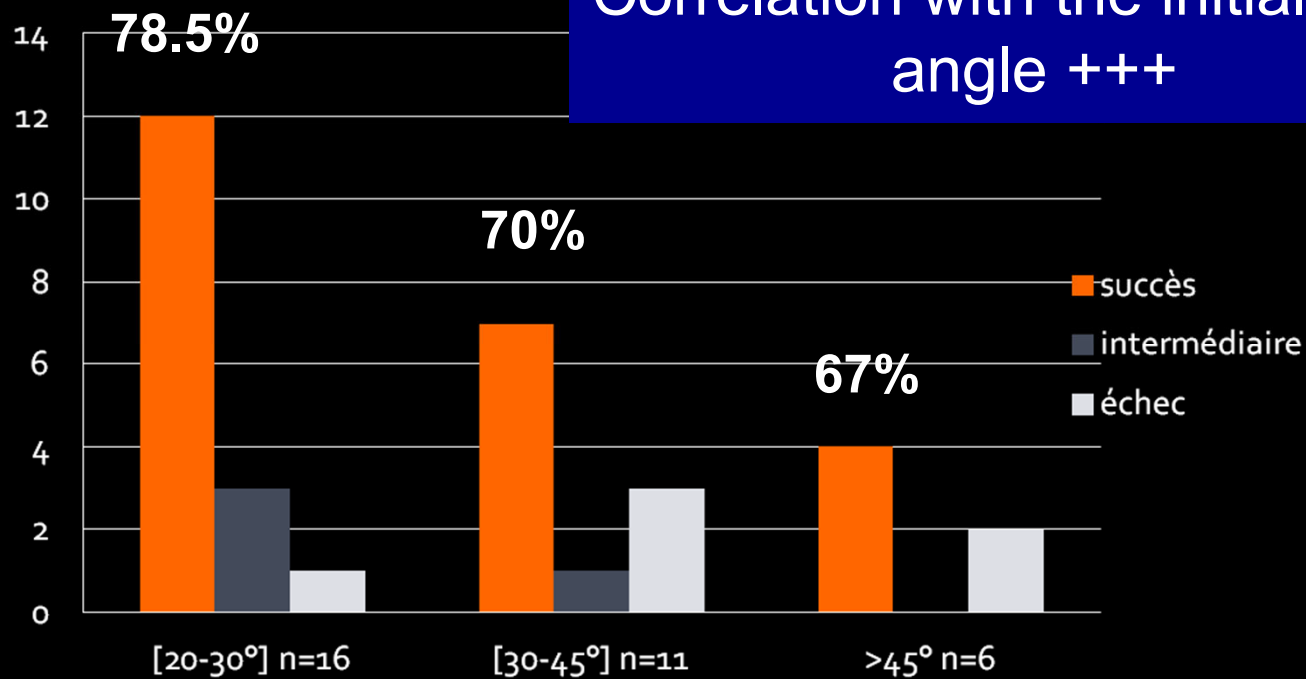
FRONTAL plane	Main curve n=33	Th n= 21	ThL n=5	Lumbar n=4	Double n=3
Before treatment	34.7° (+/-9)	32.8°	42.7°	31.5°	26°
Follow-up	26° (+/-19) (p=0.013)	22.4°	34.2°	16°	29°

SAGITTAL plane	T <sub>4</sub> -T <sub>12</sub>	L <sub>1</sub> -S <sub>1</sub>
Before treatment	22° (+/-14)	46° (+/-10)
Follow-up	29° (+/-9) (p=0.008)	55° (+/-9) (p=0.007)



# Results

n= 33	Success	Intermediate	Failure
	64% (21/33)	12% (4/33)	24% (8/33)



# Discussion: frontal plane

- 20% failure (including 1 posterior arthrodesis =3%)
- Infantiles: Mehta et al.(JBJS 2005) , Sanders et al.(JPO 2009):  
EDF casts= 15% - 35% of posterior arthrodesis at follow-up
- Juveniles I and II:

Juveniles I and II	Toto et al.	Robinson et Mc Master	Mannherz et al.	Masso et al.	Figueriedo et James	Jarvis et al.	Kahanovitz et al.
arthrodesis after brace	8/42 (19%)	77/89 (87%)	13/31 (42%)	17/34 (50%)	28/45 (62%)	7/23 (30%)	6/15 (40%)
Type of brace	Milwaukee	Milwaukee and Boston	Milwaukee	Underarm orthosis	Edinburgh brace	Part-time Charleston	Part-time Milwaukee

=> Equivalent to best studies published

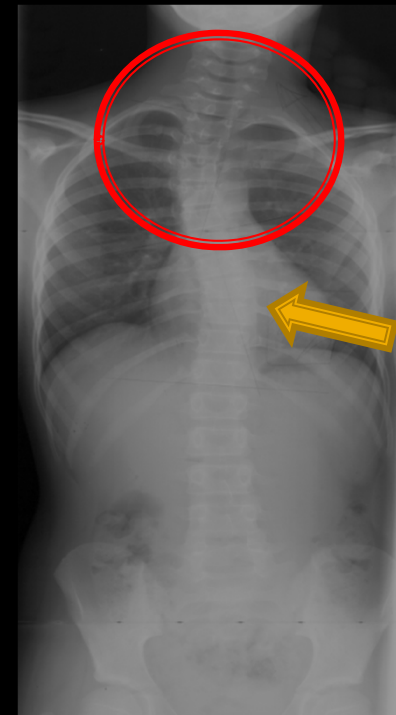
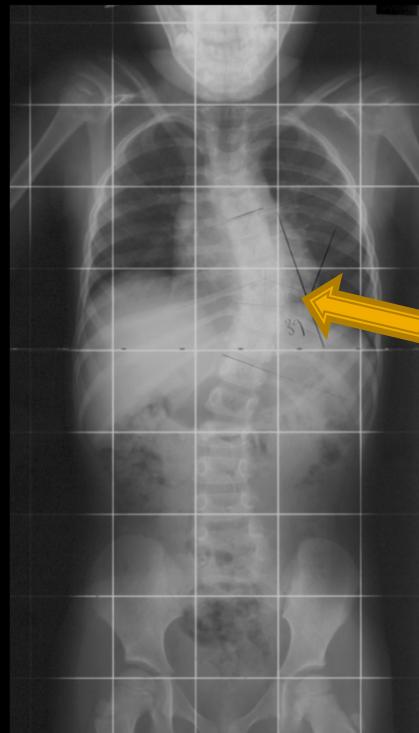
# Discussion: sagittal plane

- No modification of the sagittal curves during follow-up
- 80% of **normokyphosis** at follow-up
- No previous report in the literature in children <6 years old
- EOS (low dose radiation) +++



# Discussion

- Development of upper thoracic **contracurves**  $>20^\circ$  in **23%**
- Limits:
  - Retrospective
  - No control group
  - Quality of life?
  - Compliance?



# Conclusion



- NDB = **option** in children under 6 years old
- As efficient as in AIS: **sagittal plane** +++
- Quality of life (patient, family) needs to be further studied
- Attention must be paid to the upper thoracic contracurves
- Follow-up required until **end of growth** +++