

Pulmonary Function During Corrective Cast Treatment For EOS (Early Onset Scoliosis).

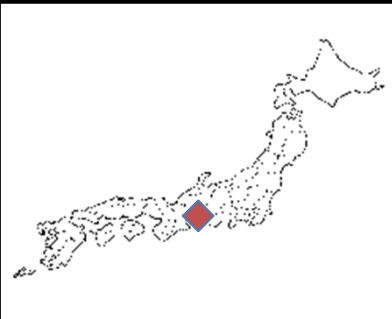
- Evaluation Of SaO2 Using Pulse Oximeter - Pilot Study -

Taichi Tsuji , Noriaki Kawakami , Kazuyoshi Miyasaka , Tetsuya Ohara

Yoshitaka Suzuki , Toshiki Saito , Ayato Nohara , Ryo Sugawara

Department of Orthopaedic & Spine Surgery, Meijo Hospital ,

Nagoya , Japan



Disclosure

Presenter:	Taichi Tsuji	No Relationships
Co-Authors:	Noriaki Kawakami	(b) Medtronic
	Kazuyoshi Miyasaka	No Relationships
	Tetsuya Ohara	No Relationships
	Yoshitaka Suzuki	No Relationships
	Toshiki Saito	No Relationships
	Ayato Nohara	No Relationships
	Ryo Sugawara	No Relationships

- a. Grants/Research Support**
- b. Consultant**
- c. Stock/Shareholder**
- d. Speakers' Bureau**
- e. Other Financial Support**

Introduction

Historically, corrective cast has been used for treatment of scoliosis. Over the years, it has evolved through countless modifications and improvements. At present, corrective cast is used for the treatment of EOS(Early Onset Scoliosis). Consequently, casting has a potential adverse constrictive effects on the thorax. However, no studies exist to date regarding the effects of corrective casts on pulmonary function. We hypothesized that cast treatment has a negative marginal effect on pulmonary function at post-treatment.

Purpose

The purpose of this study was to investigate the interference of the corrective cast treatment on the pulmonary function in patients with EOS.

Patients

Total 6 cases

Male : Female = 3 : 3

Age : Ave. 3.8 ± 2.0 y (1.0 ~ 6.0 y)

Height : Ave. 96.7 ± 17.8 cm (75 ~ 126 cm)

Weight : Ave. 13.8 ± 3.3 kg (9.8 ~ 19.0 kg)

✓ *Syndromic scoliosis : 3 cases*

(SOTOS synd. : 2 , Conradi : 1)

✓ *Congenital scoliosis : 2 cases*

✓ *Idiopathic scoliosis : 1 case*

Methods

We measured SpO₂ pre and post casting during sleep using pulse oximeter.



Cast was applied for every patient through the use of the Risser table with rotational correction posterolaterally by strap and counter rotation applied on the pelvis, with a head halter and pelvic traction. General Anesthesia was not used in any of the patients to avoid interference of general anesthesia on pulmonary function immediately after casting.

Time schedule

1st day : Admission ; pulse oximeter at night

2nd day : Casting ; pulse oximeter at night

3rd day : On Cast ; pulse oximeter at night

4th day : Discharge

or



Results

	Cobb (Degrees)	SpO2 (%)	Pulse (/ min)	SpO2<90% (%)	SpO2<80% (%)
Pre- Casting	50.2 ± 12.1	95.4 ± 2.3	83.5 ± 39.1	5.9 ± 9.1	1.3 ± 2.1
Post- Casting	30.2 ± 8.7	96.2 ± 1.9	98.5 ± 18.1	1.9 ± 4.5	0.3 ± 0.7

Average Cobb angle was 50.0 degrees pre-casting and 30.2 degrees post-casting. The SpO2 was 95.4% prior to casting and 96.2% after casting. The SpO2 did not decrease after casting.

Case presentation

2 y 0 m Female

Neuromusclar scoliosis (s/o)

BW : 3040 g / Normal delivery

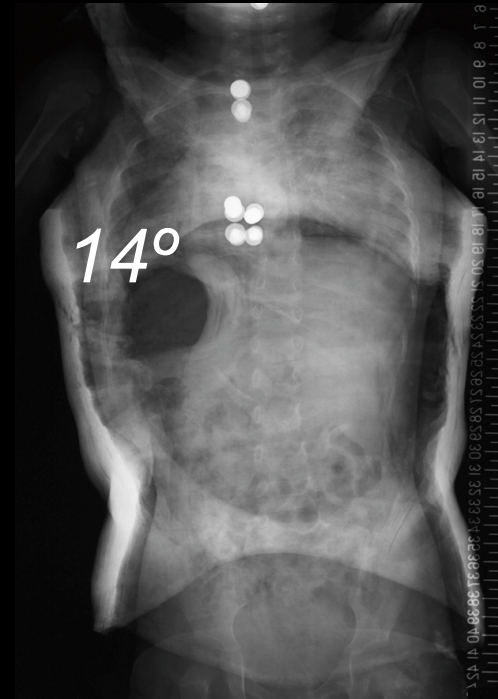
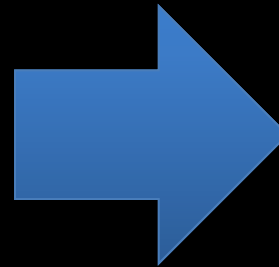
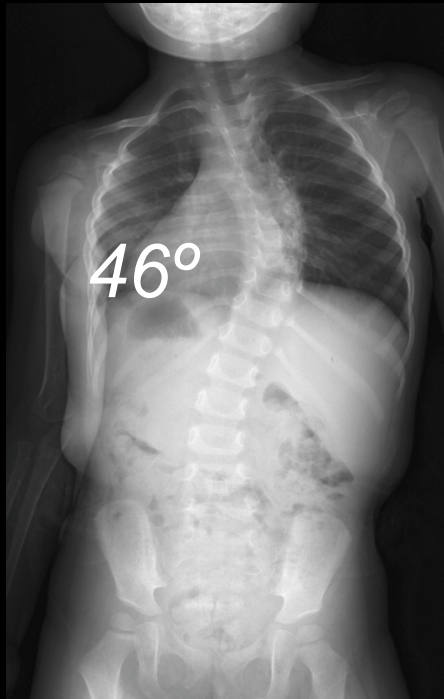
6 m : Neck sitting

1 y 6 m : Gait

1 y 10 m : Pneumonia / Scoliosis pointed out

2 y 0 m : Height / 88.7 cm , weight / 13.1 kg

Corrective casting



Duration of analysis : 387 m12s
SpO2 Ave. 95.3 %
Pulse Ave. 123.0/min
SpO2 < 90% 8.2 % (31m 48s)
SpO2 < 80% 2.9 % (11m 24s)

Duration of analysis : 590m52s
SpO2 Ave. 98.0 %
Pulse Ave. 102.0/min
SpO2 < 90% 0.1 % (24s)
SpO2 < 80% 0.0 % (0s)

Conclusions

Data obtained in this study did not exhibit a negative effect to pulmonary function at post treatment. On the contrary, a positive effect to pulmonary function was observed. This may have risen due to the correction of scoliosis via cast. Due to the limited number of patients, further research must be conducted with more patient data.