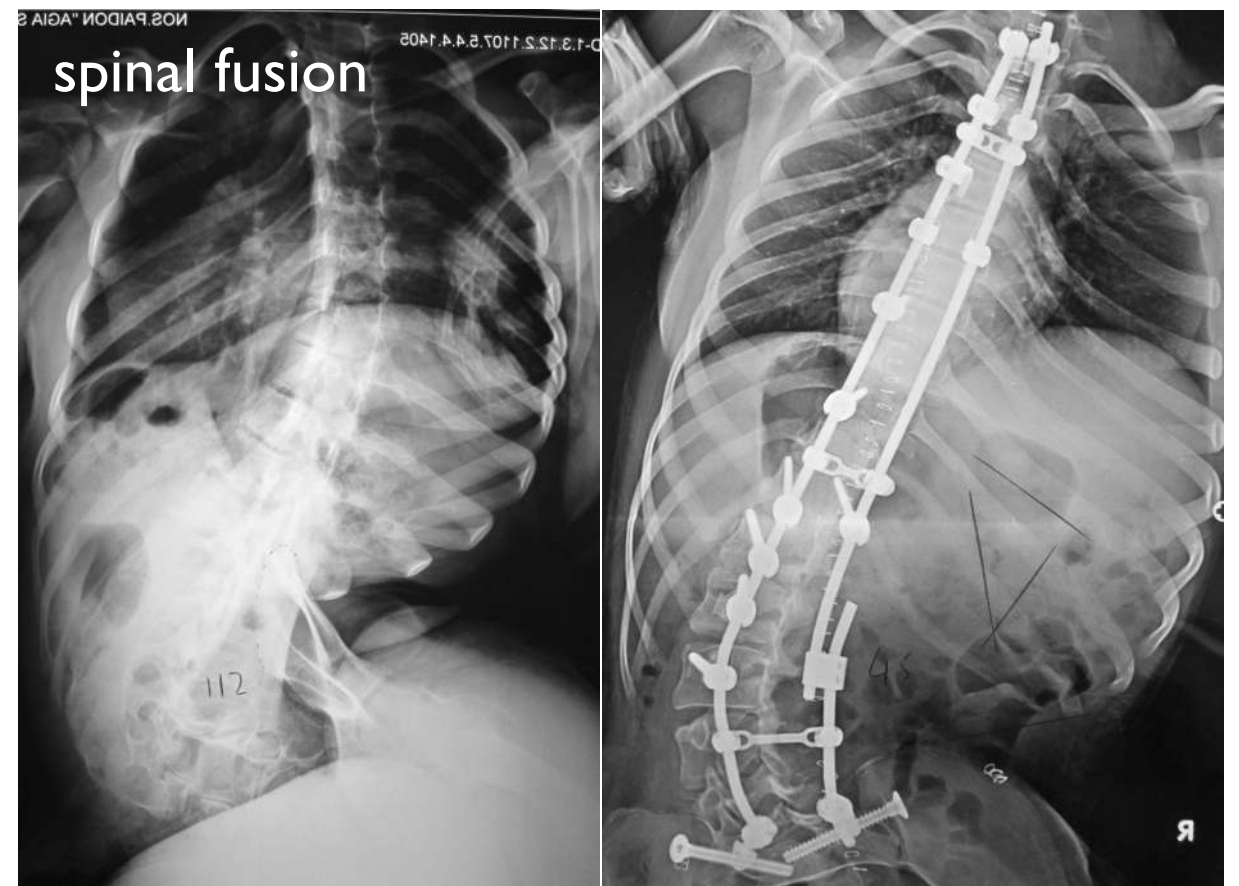
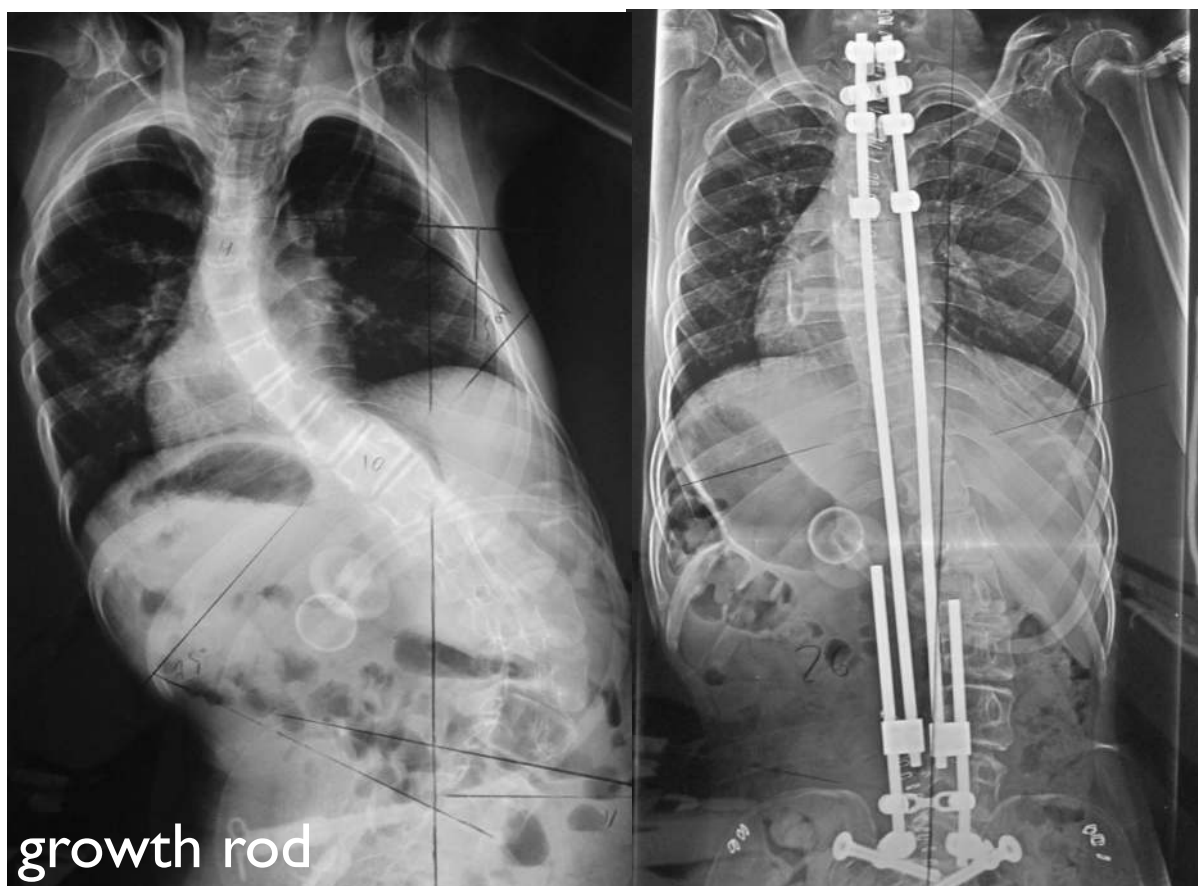


# Postoperative complications in neuromuscular scoliosis surgery in children

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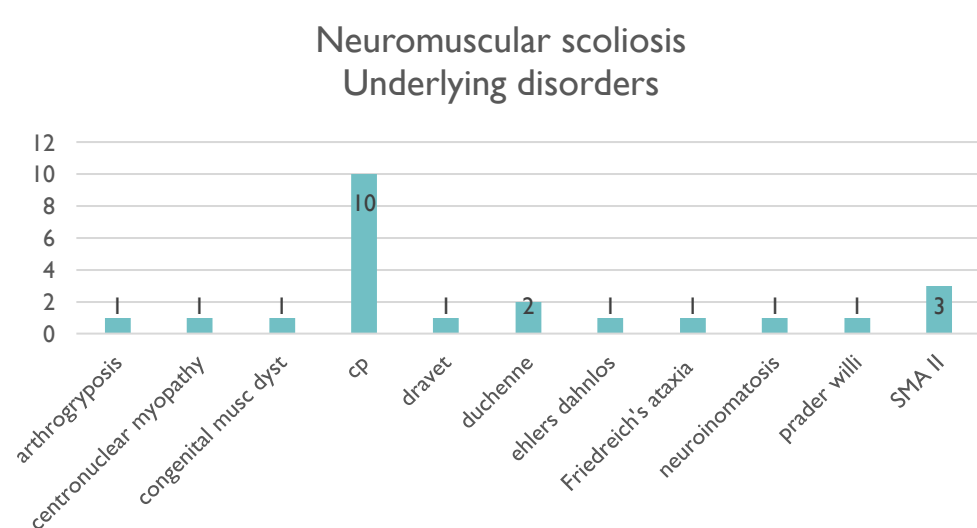


**Background and Goal of Study:** The purpose of this retrospective audit is to identify factors related with increased incidence of postoperative complications in children undergoing neuromuscular scoliosis surgery.

**Materials and Methods:** Data from 24 neuromuscular scoliosis patients operated between September 2013- September 2016 were retrieved retrospectively. SPSS 21 program, Fisher's exacts and Mann Whitney tests were used for statistics.

**Results and Discussion:** Data was available for 24 children, 14 females-10 males, 9-16 years old, 18-72 kg (mean 39).

Scoliosis was result of Cerebral Palsy in 10 cases (41.6%), Spinal muscular atrophy II in 3 (12.5%), Duchenne in 2 (8.3%) and of Arthrogryposis, Prader Willi, Centronuclear Myopathy, Ehlers Dahnlos, Neurofibromatosis, Dravet syndrome, Friedreich's ataxia, Congenital leukodystrophy PMD, Congenital muscular dystrophy, in 1 child each (4.1%). Growth rod was inserted in 13 cases (54,2%) and 13-14 vertebrae levels were fused in 11 cases (45.8%).



TIVA was used in all cases (propofol 10-7 mg/kg/h, remifentanyl 0.25-1mcg/kg/min), as well as low dose ketamine (0.2mg/kg bolus, 0.2mg/kg infusion), tranexamic acid (15mg bolus and 10mg/kg/h infusion), cell saver and a transfusion trigger of Hb 8g/dl. Morphine infusion was used for postoperative analgesia.

At least 1 postoperative complication was recorded in 11 cases (45.8%). Children transfused with >2PRBC had at least 1 more complication recorded.

Complications were recorded in: 57% of the female and 50% of the male, 46% of the growth rod cases and 63% of the vertebrae fusion cases, 50% of those with pre-existing respiratory (laryngitis, recurrent infections, NIMV, regurgitation pneumonias, atelectasis) and 52% of those with cardiac conditions (LV systolic dysfunction, mitral valve regurgitation ASD, heart enlargement), 71% of cases with walking disability, 80% of epileptic children and 80% of the transfused >2 PRBC.

Complications recorded	patients n=11
pulmonary oedema	1
pneumothorax	1
pulmonary embolism	1
respiratory failure-reintubation	1
unplanned need for NIMV	1
bradycardia and hypotension	1
elevated liver enzymes	1
wound infection	3
wound rapture	1
meralgia paresthetica	1
blood loss >2PRBC	5

	complications mean/(SD) – (n) %percentage	no complications mean/(SD) – (n) %percentage	p
age (y)	12.8 (2.3)	13.7 (2.0)	0.20
BMI	17.9 (5.3)	18.2 (4.9)	0.82
Cobb angle <sup>0</sup>	96.3	93.1 (19.1)	0.73
FVC predicted%	59.5 (32.2)	63.8 (27.9)	0.86
FEV <sub>1</sub> /FVC pred.%	103.8 (15)	104.8 (14)	0.77
preop Hb (mg/dl)	12.7 (2.6)	11.7 (3.7)	0.88
Sex			
female	(8) 57.1%	(6) 42.9%	0.52
male	(5) 50 %	(5) 50%	
Type of surgery			
growth rod	(6) 46.2%	(7) 53.8%	0.32
spinal fusion	(7) 63%%	(4) 36.4%	
duration surgery /h	5.8 (1.3)	5.2 (0.9)	0.30
pre-existing respir. condition	(4) 50%	(4) 50%	0.55
pre-existing cardiac condition	(10) 52.6%	(9) 48.4%	0.58
walking disability	(10) 71.4%	(4) 28.6%	<b>0.04*</b>
epilepsy	(4) 80%	(1) 20%	0.21
blood loss > 2PRBC	(4) 80%	(1) 20%	0.21
ICU stay /d	2.9 (0.9)	2.2 (0.3)	<b>0.02*</b>
Hospital stay /d	12.7 (4.3)	12.6 (4.8)	0.96

Complicated versus non-complicated cases had: mean age 12.8 vs 13.7 years, BMI 17.9 vs 18.2, Cobb angle 96.3<sup>0</sup> vs 93.1<sup>0</sup>, FVC 59.5 vs 63.8, FEV<sub>1</sub>/FVC 103.8 vs 104.8 (data for only 11 patients), preoperative Hb:12.7 vs 11.7mg/dl, duration of surgery 5.8 vs 5.2h, hospital stay 12.8 vs 12.6 days, ICU stay 3 vs 2.2 days. Statistic significance (p< 0.05) was reached for the walking disability factor and the prolonged ICU stay.

**Conclusion:** Walking disability may increase complications after neuromuscular scoliosis surgery. Complications may prolong ICU stay.

References: Bendon AA, et. al. 2016 Perioperative complications and outcomes in children with cerebral palsy undergoing scoliosis surgery *Paediatr Anaesth.* 26(10):970-5.  
Levy BJ et al. 2015 Complications associated with surgical repair of syndromic scoliosis. *Scoliosis.* 23;10:14.