Mortality and Morbidity in Early Onset Scoliosis Surgery

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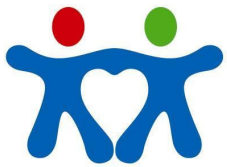

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Disclosures

- Phillips: Consultant, Synthes
- Knapp: none
- Herrera-Soto: none

Introduction

- Need for delaying fusion in EOS not in question
- Technique of unfused instrumentation well established (Harrington)
- Very high complication rate, not well addressed in the literature
- Great need to develop non repetitive surgical methods for these children with dismal prognosis left untreated.

Purpose

- Study designed to analyse the outcomes in a small group of patients surgically treated for EOS from one centre with 100% follow up over 8 years

Methods / Materials

- Inclusion criteria: All children with EOS seen at our Centre who had had surgery, here in Orlando or elsewhere
- Included pts. referred out by us
- Included pts. who moved to Florida from elsewhere

Methods / Materials

- All pts. were followed up to the time of writing
- Those who moved out of State followed by phone, Email or collegial communication at meetings
- October 2002 to November 2010
- Type of implants, number and type of complications
- Geographic origin and migration, final outcome
- Diagnoses

Methods / Materials

- Did NOT look at:
- Cardiorespiratory function
- Spinal growth achieved
- Comorbidities

Results

- Total of 165 surgical procedures on 28 patients
- Index procedures, lengthenings and complication surgeries, definitive fusions
- 18 growing rods 8 VEPTR, 2 Shilla
- Nine definitive fusions

Diagnoses

Diagnosis	Number of patients
Cerebral Palsy	3
Spinal Muscular Atrophy	4
Jarcho Levin Syndrome	1
Coffin Lowry Syndrome	1
Townes Brock Syndrome	1
Multiple Pterygium / congenital scoliosis	2
Congenital scoliosis	3
Arthrogryposis	2
Camptomelic dysplasia	1
Williams Syndrome	1
Jeune's- like syndrome	1
Atelosteogenesis type III	1
Congenital scoliosis with rib fusion	1
Spina Bifida	2
Oro – facial – digital syndrome type III	1
Soto's syndrome (includes 2 CP patients included above)	(2)
Juvenile/ infantile scoliosis	3

Table X: Patients by diagnosis

Complications

- Total number was 65 or 39%
- Mortality was 5 of 28 or 18%
- Three of the 5 had their index surgery out of State

Complications

- No patients were lost to follow up from our Centre

Causes of death were not determined by autopsy

By history, all died from pulmonary failure

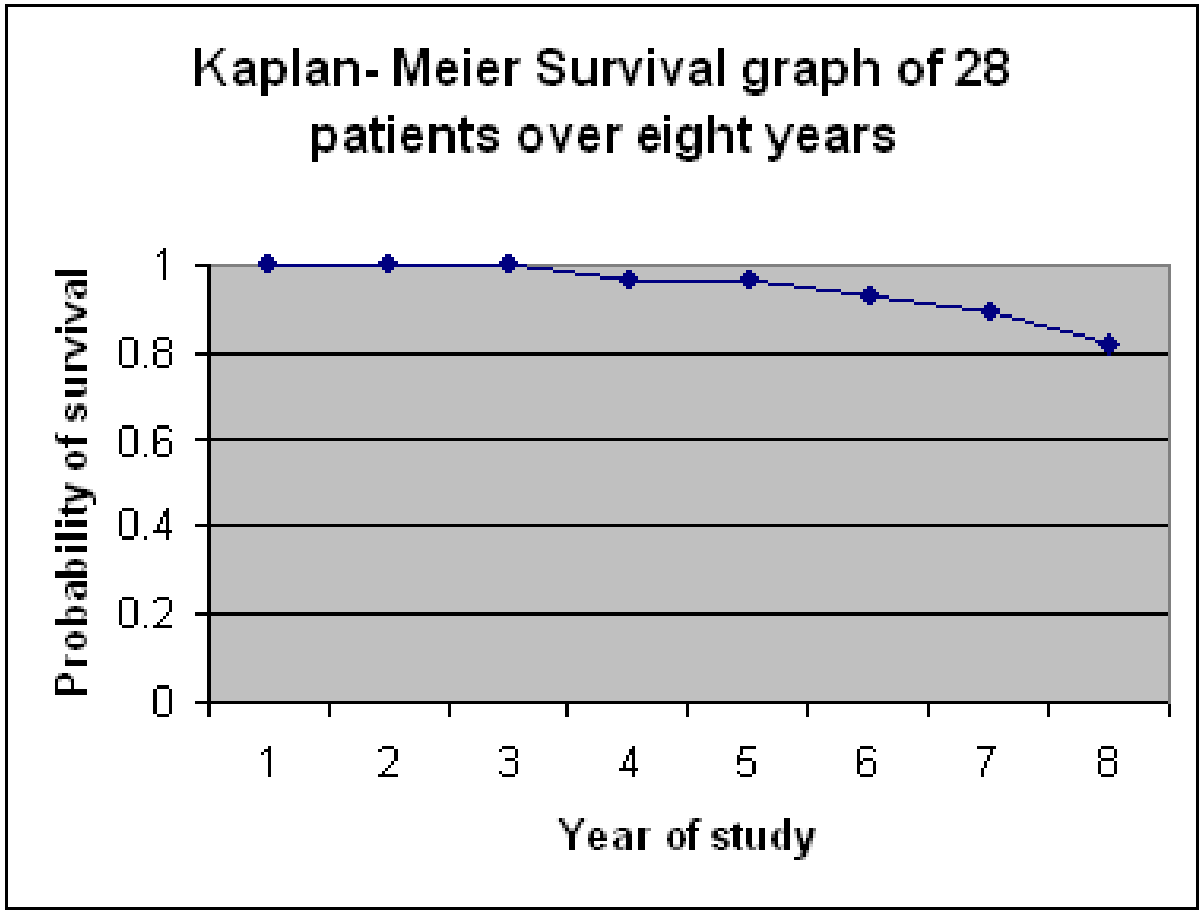
Presence of tracheotomy in 2 patients did not preclude massive respiratory collapse

Mortality Data

Patient	Diagnosis	Age at first surgery	Age at death	Cause of death
1	Cerebral Palsy	4+9	6+3	Sepsis, respiratory failure
2	Coffin Lowry Syndrome	5 yrs	16+1	Respiratory failure
3	Multiple Pterygia / congenital scoliosis	5 yrs	9yrs	Respiratory failure
4	Jarcho Levin Syndrome	2 yrs	3 yrs	Respiratory failure
5	SMA	7+1	10 yrs	Respiratory failure

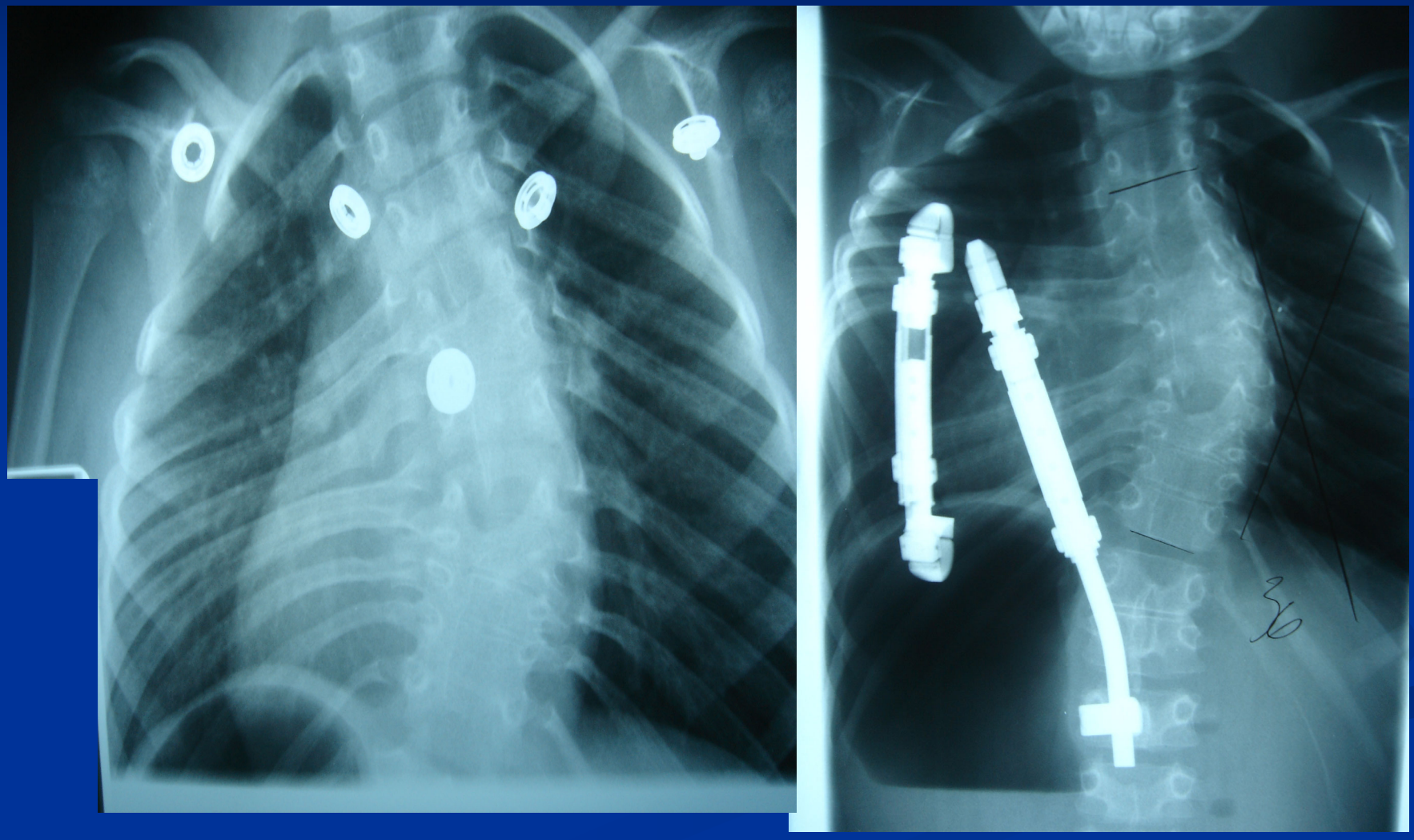
Table 1: Analysis of mortality.

Survivorship over eight year Study Period



(95% confidence level 0.98 to 0.66

5 yr female, congenital scoliosis
Successful control of curve with VEPTR done at another center



5 yr female congenital curve

- Exposed hardware, succesfully debrided / closed age 10
- Heelcord lengthening 6 months later without problem
- Died of aspiration pneumonia 3 weeks before scheduled lengthening of VEPTR

Discussion

- Mortality in EOS surgery barely reported
- Harrington reported 2 deaths in his series
- One was a six year old with polio
- Bess et al. 2010, Thompson et al. 2005 reported no mortality in large studies

Discussion

- Not clear why we saw such a huge mortality rate
- Not a local phenomenon since three of five had surgery initiated elsewhere, some had all their surgery elsewhere

Conclusion

- The goal of unfused instrumentation in EOS is to preserve lung function and prolong or save lives
- Without this surgery the outlook is dismal
- This report underscores the severity of EOS
- More work is needed in implant development and pulmonary management in this disease spectrum

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