EOS Graduates: Where are we in 2019?

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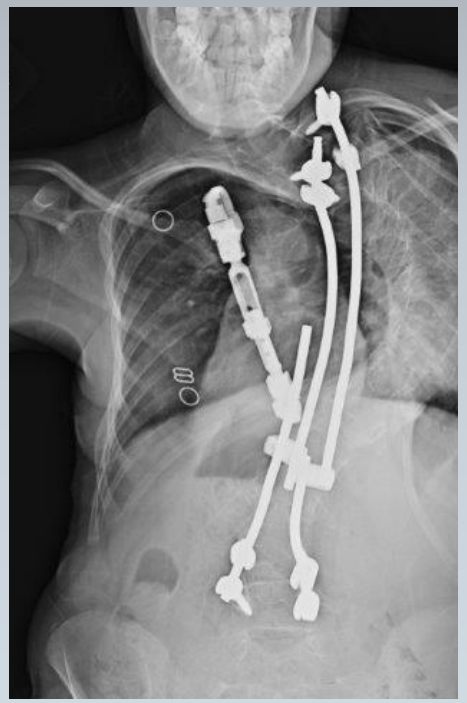
Methodist Healthcare Family

CAMPBELL CLINIC ORTHOPAEDICS

EOS Graduates: Where are we in 2019?



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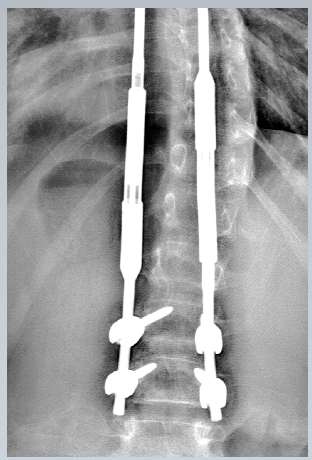
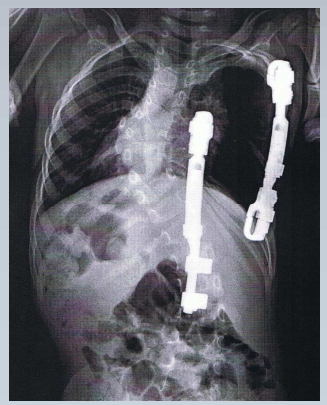
Introduction

EOS treatment rapidly changing field.





Graduate cohort increasing.

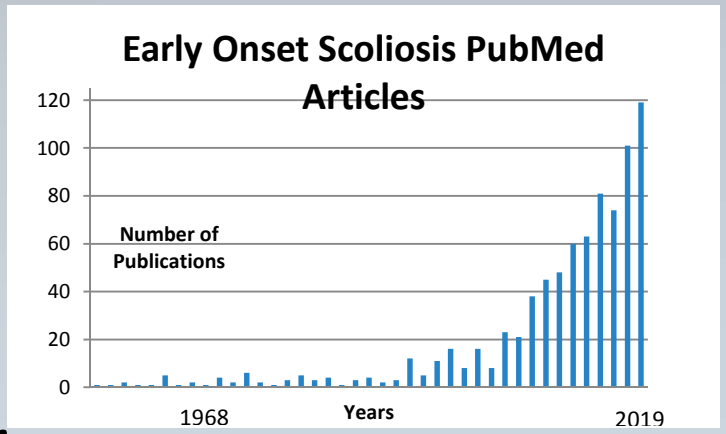
Improved systematic study of EOS patients.

Introduction

EOS treatment rapidly changing field.

Tremendous technologic advances.

Improved systematic study of EOS patients



Introduction

Definition of “Graduate”

No long term studies – expert opinion.

Very little is known about EOS patients in adulthood.

Information important for families and health care systems.

Graduates 2019: Where are we now?

Pulmonary Function Following Early Thoracic Fusion in Non-Neuromuscular Scoliosis

By Lori A. Karol, MD, Charles Johnston, MD, Kiril Mladenov, MD, Peter Schochet, MD, Patricia Walters, RRT-NPS, and Richard H. Browne, PhD

JBJS 2008

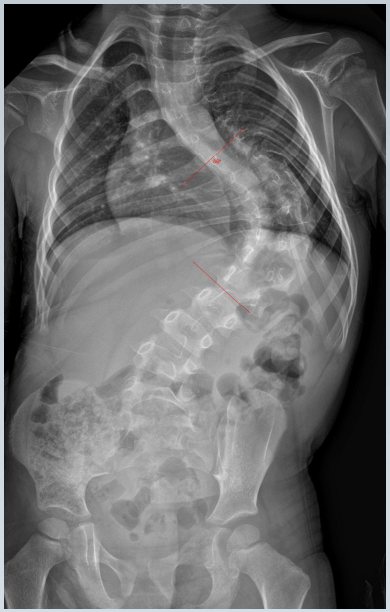
Early in-situ fusion bad: ↓ thoracic height

T1-T2 fusions worse

Graduates 2019: Where are we now?

Not all graduates with EOS are the same

cEOS classification



Graduates 2019: Where are we now?

Fusion after growing treatment:

minimal gain in thoracic height

minimal curve correction

high complication rate

Radiographic Outcome and Complication Rate of 34 Graduates After Treatment With Vertical Expandable Prosthetic Titanium Rib (VEPTR): A Single Center Report

Daniel Studer, MD, Philippe Büchler, PhD,† and Carol C. Hasler, MD** **JPO 2019**

Avoidance of "Final" Surgical Fusion After Growing-Rod Treatment for Early-Onset Scoliosis

Amit Jain, MD, Paul D. Sponseller, MD, John M. Flynn, MD, Suken A. Shah, MD, George H. Thompson, MD, John B. Emans, MD, Jeff B. Pawelek, BS, and Behrooz A. Akbarnia, MD, on behalf of the Growing Spine Study Group **JBJS 2016**

Complications and Radiographic Outcomes of Posterior Spinal Fusion and Observation in Patients Who Have Undergone Distraction-Based Treatment for Early Onset Scoliosis

Jeffrey R. Sawyer, MD[a,*], Rodrigo Góes Medéa de Mendonça, MD[a], Tara S. Flynn, BA[f], Amer F. Samdani, MD[b], Ron El-Hawary, MD[c], Alan J. Spurway, MASc[c], John T. Smith, MD[d], John B. Emans, MD[e], Tricia A. St. Hilaire, MPH[f], Stephen J. Soufleris, BS[a], Ryan P. Murphy, BS[a], Children's Spine Study Group **Spine Def 2016**

Graduates 2019: Where are we now?

"Final fusion" may not be final

100 pts mixed etiology (4.2 years mean f/u)
mean age 12.2 yrs

20% patients UPROR (30 complications/57 procedures): 1.5/pt

infection
instrumentation
curve progression

Final Fusion After Growing-Rod Treatment for Early Onset Scoliosis

Is It Really Final?

Connie Poe-Kochert, RN, CNP, Claire Shannon, MD, Jeff B. Pawelek, BS, George H. Thompson, MD, Christina K. Hardesty, MD, David S. Marks, FRCS, Behrooz A. Akbarnia, MD, Richard E. McCarthy, MD, and John B. Emans, MD

JBJS 2016

Graduates 2019: Where are we now?

Observation viable option in some patients

Jain *et al* (JBJS 2016)	30 patients (mean 3.7 years) 26/30 no further surgery 4/30 infection
Sawyer *et al* (Spine Def 2016)	12 patients (mean 4.0 years) 12/12 patients no further surgery
Cheung *et al*	

Graduates 2019: Where are we now?

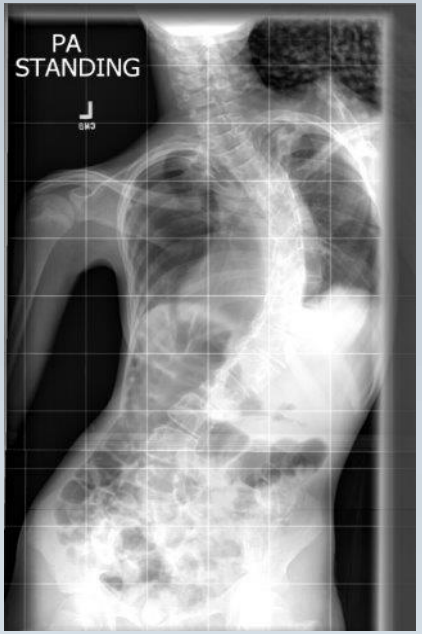
Observation viable option in some patients

Graduation Protocol After Growing-Rod Treatment: Removal of Implants without New Instrumentation Is Not a Realistic Approach

Ismail Aykut Kocyigit, MD, Z. Deniz Olgun, MD, H. Gokhan Demirkiran, MD, Mehmet Ayvaz, MD, and Muharrem Yazici, MD

removal instrumentation is not

9/10 patients deformity progression



Graduates 2019: Where are we now?

Growth Sparing Treatment

spine elongation

preservation of baseline pulmonary

similar activity as peers – higher energy

small series (12 pts)

Functional and Radiographic Outcomes Following Growth-Sparing Management of Early-Onset Scoliosis

Charles E. Johnston, MD, Dong-Phuong Tran, MS, and Anna McClung, BSN, RN

Graduates 2019: Where are we now?

Spinal fusion at end of growing treatment

minimal correction

high complication rate

Instrumentation removal at end of growing treatment – failure

Observation may be best.

Is there something better?

Gradutates 2019: Where do we need to go?

Define “Graduate”

Patient/etiology specific care plans? (cEOS)

Patient/family outcome measures.

Graduates 2019: Where do we need to go?

What will live be like as an adult?

live independently?

get married?

work?

be alive?

Graduates: Long term outcome study

developed 2018

EOS patients: age ≥ 18 years, ≥5 years from surgery

Multicenter study

Validated outcome scores

Graduates: Long term outcome study

70 question survey

3 validated outcome measures:

SRS-22	Spine related
FACIT-Dyspnea	Pulmonary related
SF-12	QOL related

Demographic: married/working/living

Graduates: Long term outcome study

Data collection started 10/19

Descriptive cohort study – long term follow up

Develop “Graduates” database – future study

Conclusions:

Tremendous advances made in treatment of EOS patients.

Changes more rapid than our knowledge of outcomes.

Long term outcome: parents & families
research

health care systems/payors

Conclusions: Stay Tuned