

DEPARTMENT OF SURGERY | Office of Surgical Fellowship



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SHORT-TERM COMPLICATIONS IN VEPTR AND MAGNETICALLY CONTROLLED GROWING RODS TO MANAGE EARLY ONSET SCOLIOSIS

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- NO POTENTIAL CONFLICT OF INTEREST

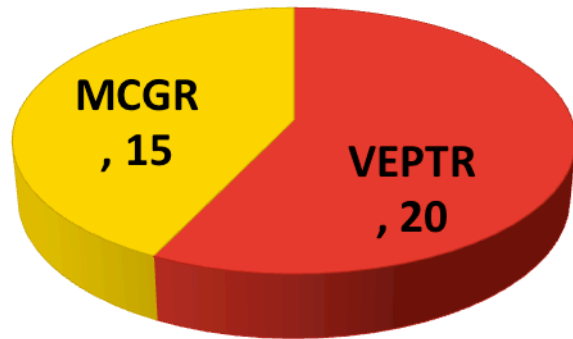
- **IS THERE ANY DIFFERENCE IN COMPLICATIONS AND REOPERATION RATES COMPARING VEPTR AND MCGR AT A 1 YEAR FOLLOW UP?**



- Retrospective cohort, single-center, quality improvement study*
- N= 35 EOS patients 2010-2016 (1 year follow-up)

TABLE 1A. DEMOGRAPHICS

	MCGR GROUP (n=15)	VEPTR GROUP (n=20)	P value*
SEX (males%)	8(53.3%)	9(45%)	0.884
AGE Median (IQ 25-75)	7(3-10)	4(1.6-12)	0.020
N° DISTRATIO NS N (%)			< 0.001
N° Distractions 1	0	14 (70)	
N° Distractions 2	0	6 (30)	
N° Distractions 4	15 (100)	0	
N° STAGES N (%)			< 0.001
N° Stages 1	4 (26.7)	18 (90)	
N° Stages 2	11 (73.3)	2 (10)	
ETIOLOGY (%)			0.891
N	9(60%)	11(55%)	
C	3(20%)	3(15%)	
I	1(6.7%)	1(5%)	
S	2(13%)	5(25%)	



PREOP

1 YEAR
POSTOP

TABLE 1B. PREOP RADIOGRAPHIC MEASUREMENTS

	MCGR GROUP (n=15)	VEPTR GROUP (n=20)	P value
THORACIC COBB	68(40-129)	75(18-126)	0.607
LUMBAR COBB	60(45-76)	58.5(15-78)	0.945
AVT	41(25-105)	45(4-129)	0.521
T1 TILT	17(1-32)	12(0-39)	0.781
T1T12 HEIGHT	173(105-276)	150(87-199)	0.0343
T1S1 HEIGHT	289(194-432)	257(164-296)	0.0328
CORONAL BALANCE	22(0-60)	15(0-32)	0.102
THORACIC KYPHOSIS	32(4-96)	42(-42,96)	0.515
T2T5 KYPHOSIS	13(-10,50)	6(-24,23)	0.0506
LUMBAR LORDOSIS	51(19-104)	44.5(-26,59)	0.225
SAGITTAL BALANCE	29(-37,138)	49(0-78)	0.219

Data PRE surgery. **AVT**: apical vertebral translation. *Mann Whitney test

TABLE 3. COMPLICATIONS AND REOPERATIONS

	MCGR (n=15)	VEPTR (n=20)	P value*
INFECTIONS N° (%)	1(6.7%)	2(10%)	0.727
IMPLANT FAILURES N° (%)	1(6.7%)	7(35%)	0.048
PROGRES N° (%)	0	1(5%)	0.380
NEW ROD.1Y N° (%)	0	5(25%)	0.036
PNEUMO(1) N° (%)	0	3(15%)	0.066
PNEUMO(2) N° (%)	0	1(5%)	
NEUROLOGICAL INJURY N° (%)	0	1(5%)	0.380
TOTAL COMPLICATIONS N° (N, %)	2(1,6.7%)	16(13,65%)	<0.001
REOP(1) N° (%)	0	8(35%)	0.006
REOP(2) N° (%)	1(6.7%)	2(10%)	
REOP(4) N° (%)	0	1(5%)	
TOTAL REOP N° (N, %)	2(1,6.7%)	16(10,50%)	

Hardware: includes dislodgements, migrations and breakage. **Progress:** progression requiring new rod. **Newrod1:** new rod inserted in less than 1 year. **Pneumo1:** patients with 1 pneumothorax. **Pneumo2:** two episodes of pneumothorax in same patient in less than one year. **Reop1:** patients with 1 reoperation in less than 1 year. **Reop2:** 2 reoperations in less than 1 year. **Reop5:** 5 reoperations in less than one year.
*Fisher test and Chi-square test

- **Retrospective** design
- Heterogeneity of the population
- Relatively short follow-up (1 year)
- No cost analysis
- No EOSQ24

- **Lucas et al** (2013) 54 VEPTRs with a mean follow up of 22.5 months reported a complication rate of **137% per patient and 40% per surgery**⁵
- NICE study (2014) in United Kingdom concluded that using the MAGEC system would avoid repeated surgical procedures for growth rod lengthening⁶.
- **Wudbhay et al**⁷ (2010), no significant differences in number of complications comparing TGR, Hybrid or VEPTR.
- **Lebon et al**⁸ (2017) concluded that MCGR avoided an average of 2.03 scheduled surgical procedures per patient compared to traditional growing rod (GR).
- In our MCGR group, 11 patients were managed in 2 stages

5.- G Lucas, G Bollini, JL Jouve, et al. Complications in pediatric spine surgery using the vertical expandable prosthetic titanium rib, the French experience Spine, 38 (2013), pp. E1589-E1599

6.- Jenks M, Craig J, Higgins J, Willits I, Barata T, Wood H, Kimpton C, Sims A. The MAGEC system for spinal lengthening in children with scoliosis: A NICE Medical Technology Guidance. Appl Health Econ Health Policy. 2014 Dec;12(6):587-99

7. Wudbhav N. Sankar, MD, Daniel C. Acevedo, MD, and David L. Skaggs, MD Study. Comparison of Complications Among Growing Spinal Implants. Spine 2010;35:2091–2096

8-Lebon J, Batailler C, Wargny M, Choufani E, Violas P, Fron D, Kieffer J, Accadbled F, Cunin V, De Gauzy JS. Magnetically controlled growing rod in early onset scoliosis: a 30-case multicenter study. Eur Spine J. 2017 Jun;26(6):1567-1576.

- **MCGR** have shown to have a significantly **lower complication rate** (6.7%) and **unplanned surgery rate** as compared to VEPTR (50%) during the first year.
- The staged MCGR insertion may explain the lower implant complications at 1 year in the MCGR group.
- Longer follow up is required to further address our hypothesis.