

Early Experience of Firefly 3DPG in Paediatric Scoliosis Surgery

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Disclosures

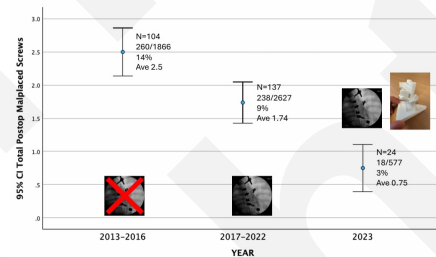
- Mr McCarthy – Educational contract Globus
- Mr James – Educational contract Nuvasive
- Mr Jones – Educational contracts Nuvasive, Kuros, Synergy and Paradigm

The Problems

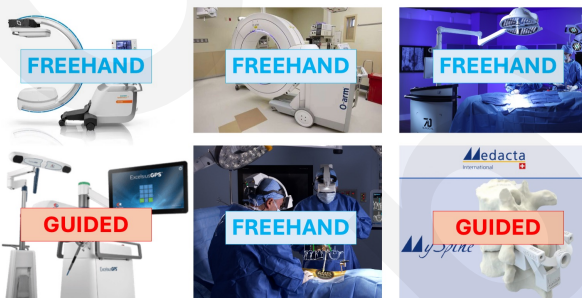
- Missed screws:
 - Review of 265 paediatric cases 2013-2023
 - 5070 screws – all freehand placement – **no routine II until 2017/8**
 - 516 (10%) deemed malplaced on post op XR
- IONM alerts:
 - Review of 206 paediatric cases 2017-2022
 - 11 (5%) had an intraoperative neuromonitoring event
 - 1/3 during screw insertion and 1/3 during curve correction
- Claims:
 - 12 claims settled 2003-2020 CVUHB for malplaced screws (all surgeries)



The Problems

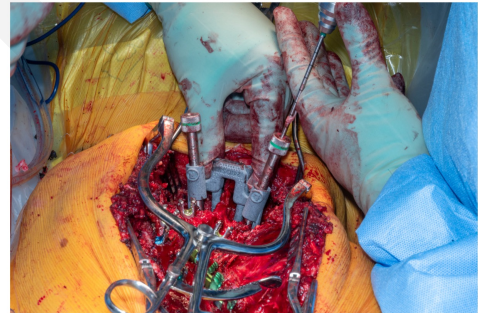
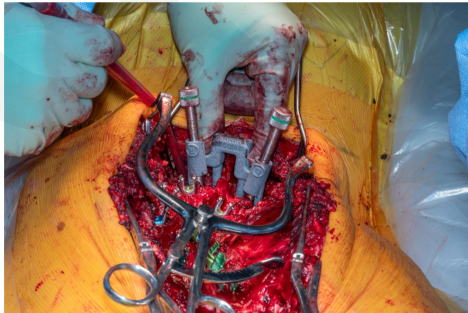
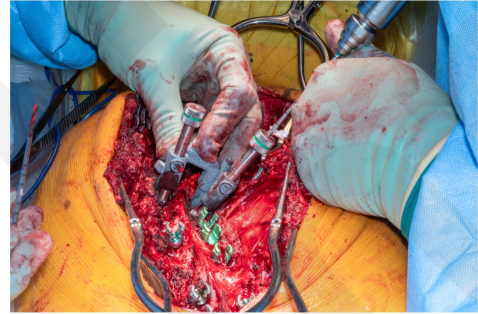
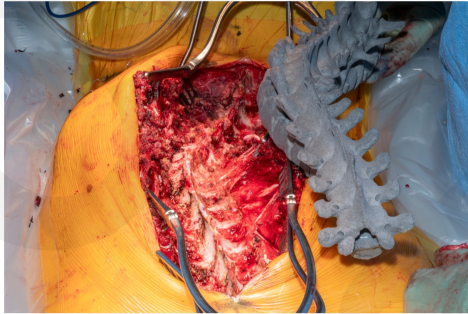
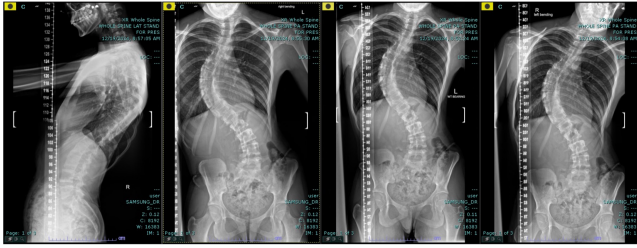


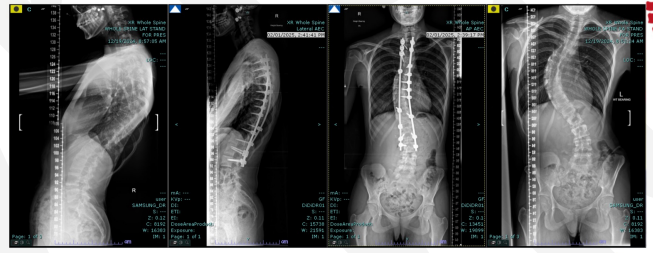
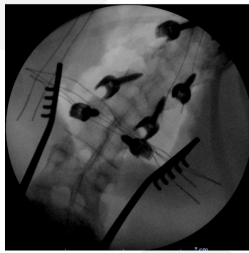
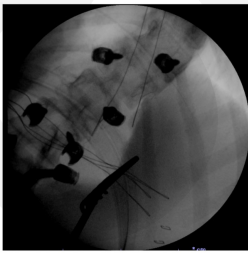
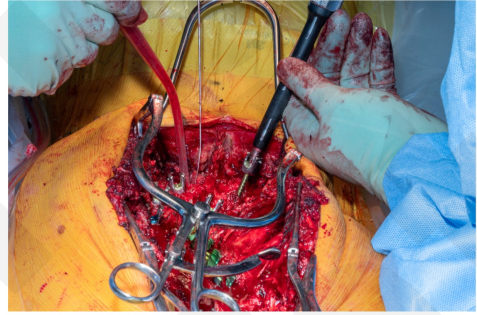
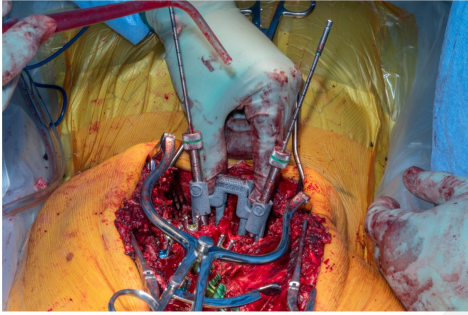
The Solutions



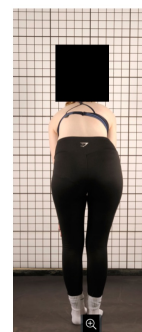
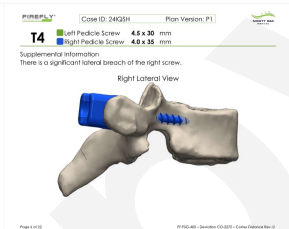
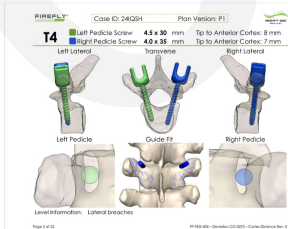
Cardiff Experience

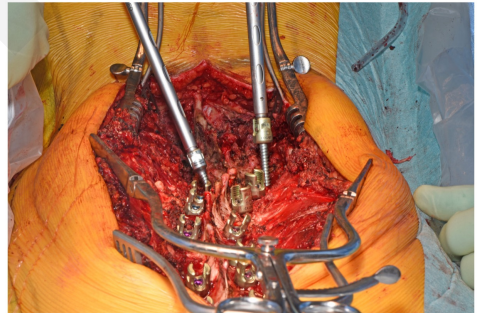
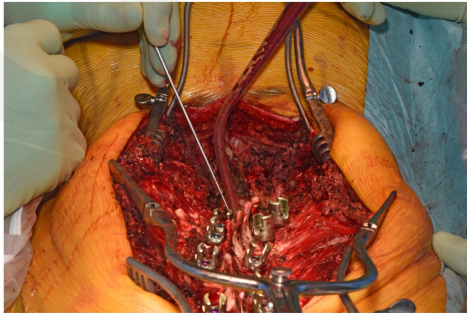
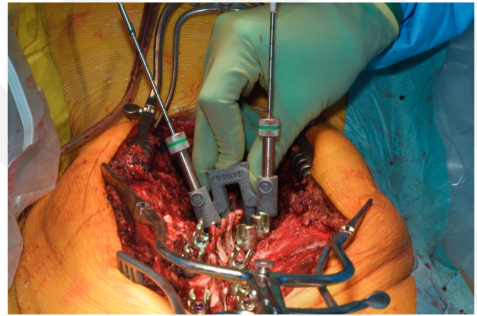
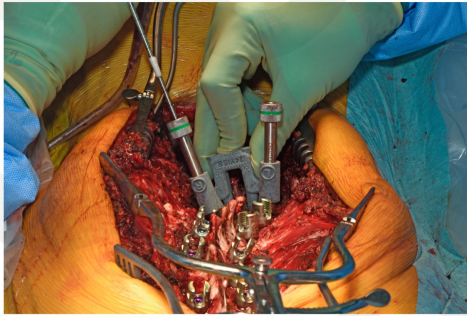
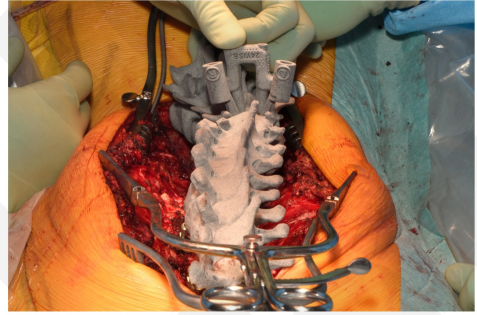
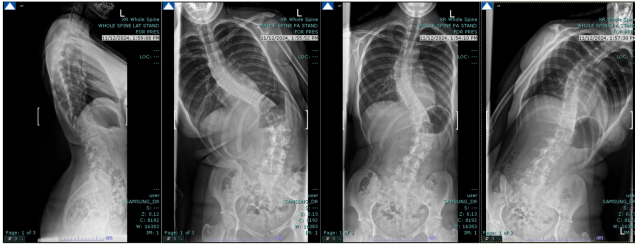
- October 2024 started using Firefly 3DPG
- 14 Paediatric Cases (8/10/24 to 4/2/25)
- Technique – dual surgeon - precontoured rods with monoaxial screws in concavity – reduce spine to rod with towers then perform further derotation on mono screws - workflow unchanged by use of guides

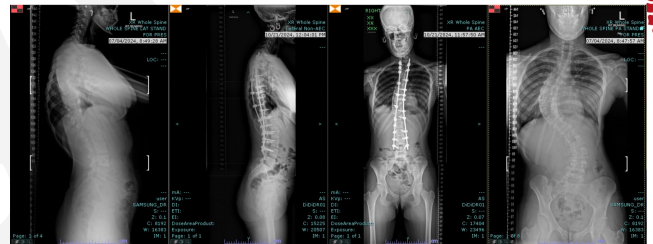
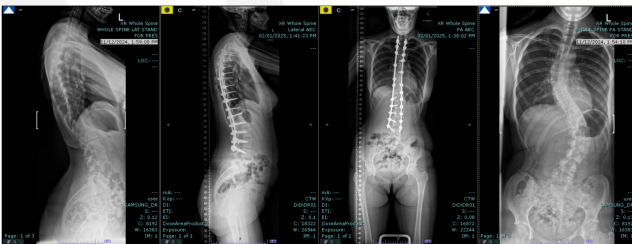
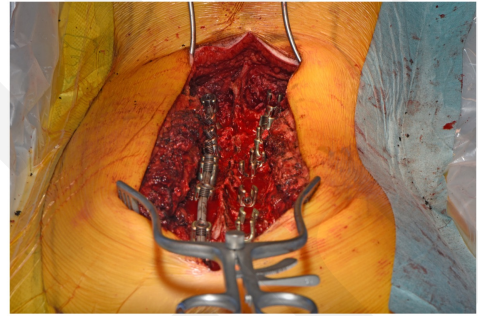
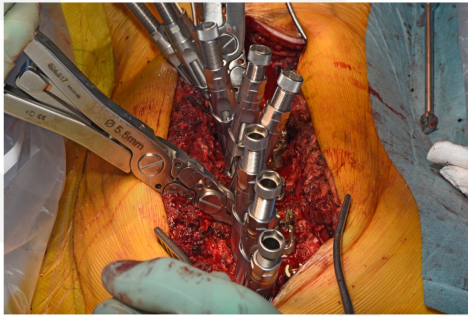
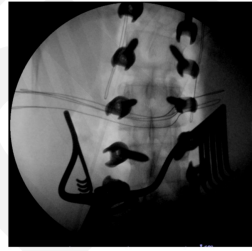
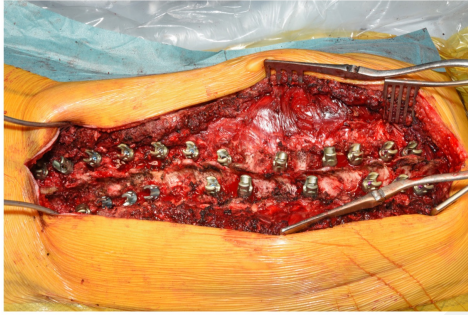


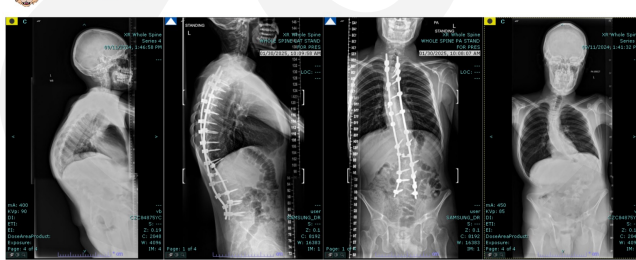
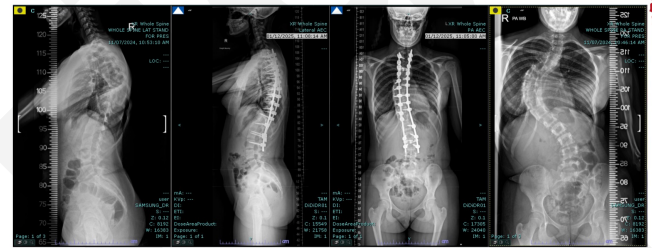
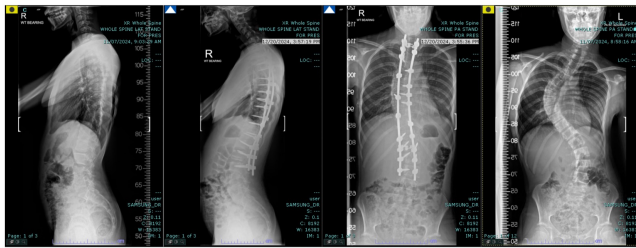


Tips









Freehand vs 3D Printed Guides

	Freehand n=70	Firefly n=14	
Number of screws	1237	281	
Number of levels	13.1	12.9	NS
Patients with screws to pelvis	4%	0%	NS
Screws per patient	17.7	20	p<0.05
Intraop misplaced screws per pt	1.5	1.4	NS (wide CI)
Postop misplaced screws per pt	0.5	0.6	NS(wide CI)
% of screws considered misplaced	3%	5%	NS (wide CI)
Total postop long screws	15	0	p<0.05

Freehand vs 3D Printed Guides

	Freehand n=70	Firefly n=14	
Op time	175 mins	172 mins	NS
Time per screw	10 mins	8.6 mins	NS (wide CI)
Blood loss	778 ml	807 ml	NS
CT radiation dose	54 mGycm ²	506mGycm ²	P<0.001
II radiation dose	0.09Gycm ²	0.11Gycm ²	NS
Postop CT	5 patients	0 patients	

- Preop Cobb, postop Cobb and change in Cobb were not significantly different between the groups (73/70 to 30/25)
- Average of 1.3 jig issues reported per patient

