

Transverse Plane Deviations in Spastic Diplegia: Patient Outcome

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Treatment

Based on the history, physical exam, and the gait analysis, it was decided to perform bilateral femoral derotational osteotomies, a right tibial derotational osteotomy, and bilateral gastrocnemius recessions (Strayer on the right, Vulpius on the left). Postoperatively, she was mobilized weight bearing as tolerated in short leg casts, and knee immobilizers on and off every 2 hours for 6 weeks. After that, she was placed in solid ankle-foot orthosis. She re-

turned for a postoperative gait analysis 12 months later. Figure 1 shows a more normalized rotational profile on physical exam. Pelvic kinematics show no change in her increased pelvic tilt, but hip kinematics also marked improvements in rotation (Figure 2 and 3). Knee and ankle kinematics show marked improvements in knee hyperextension and right tibial torsion (Figures 4 and 5), and radiographs show healed osteotomies (Figure 6).

Figure 1. Postoperative Physical Exam

	PASSIVE ROM				STRENGTH		KEY
	Right		Left		Right	Left	
Hip Flex	120	110	115	110	3+	3+	0 No palpable contraction or observable movement.
Hip Ext	0	-10	-5	-10	3+	3+	1 Contraction in the muscle but no observable movement
Hip Abd	38	25	20	22	3+	3+	1+ Visible movement of the part but <50% through the available range in a gravity-eliminated position.
Hip Int Rot	40	57	40	60			2- >50% AROM through the available range in a gravity-eliminated position.
Hip Ext Rot	52	10	50	8			2 Full AROM through the available range in a gravity-eliminated position.
Knee Ext		-5		1	3+	3+	2+ Full AROM with some manual resistance in a gravity-eliminated position.
Knee Flex	130	WNL	128	WNL	3+	3+	3- >50 AROM through the available range against gravity.
Pop Angle	50 48	90 85	68 65	95 90			3 Full AROM through the available range against gravity.
Ely Test	120	85	115	80			3+,4- Full AROM against gravity - minimal manual resistance.
Dorsi (flex)	15	10	10	-2	1+	1+	4,4+ Full AROM against gravity - moderate manual resistance.
Dorsi (ext)	8	-5	4	-10			5 Full AROM against gravity - maximal manual resistance.
Plantar	40	30	60	30	1+	1+	
Ankle Inv	40	25	38	20	1+	1+	
Ankle Ever	30	20	28	20	1+	1+	
TMA	14 EXT	24 EXT	18 EXT	20 EXT			
TFA	4 EXT	10 EXT	12 EXT	10 EXT			
FF AB/ADD	6 ABD	3 ADD	6 ABD	3 ADD			
Calcaneal Inv	5	25	5	25			
Calcaneal Ever	5	10	5	10			
Leg Length	79.0		79.0				
Knee Varus/Valgus							

(Green = preop, Red = postop)

Figure 2. Postoperative Pelvic Kinematics

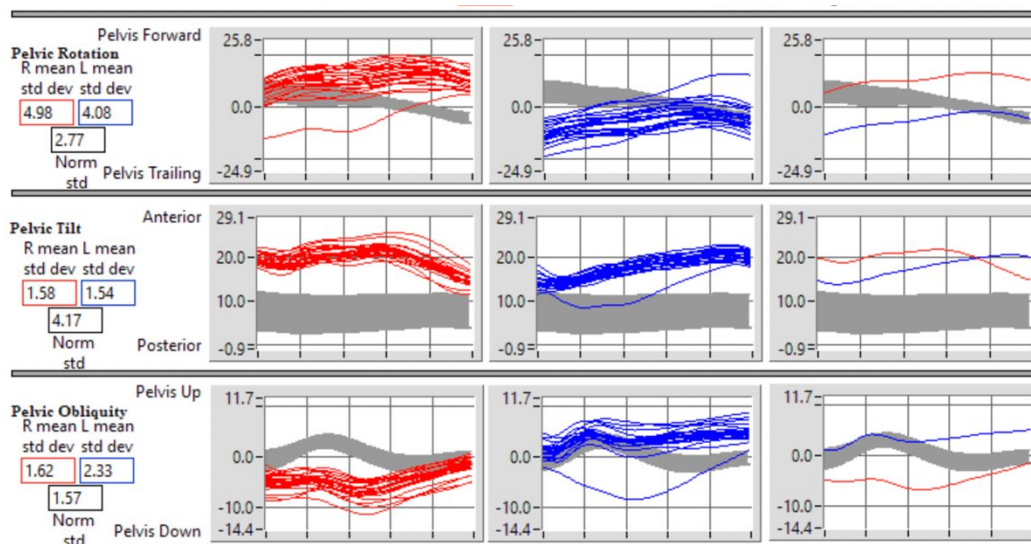


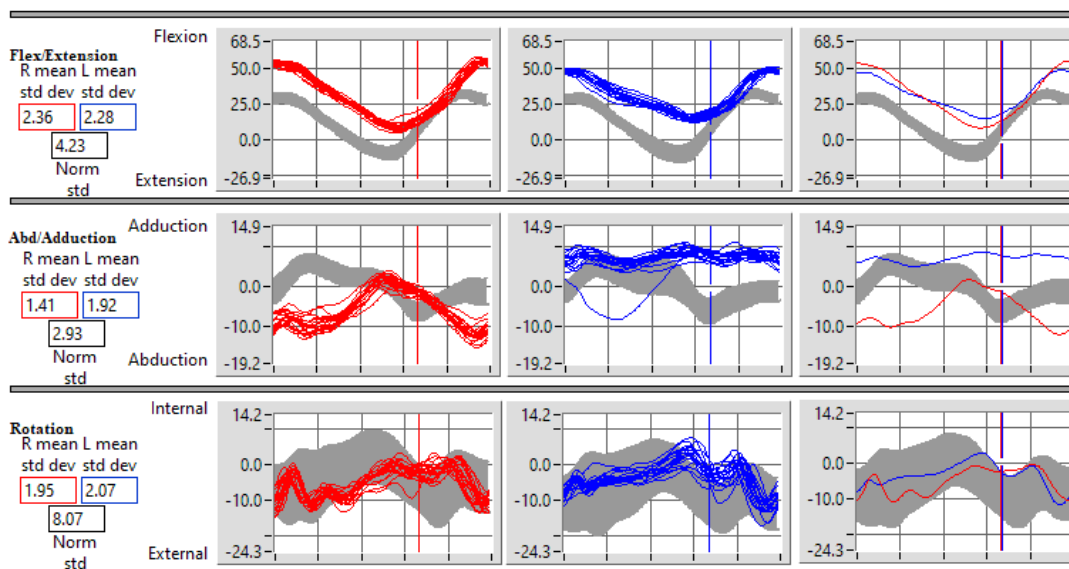
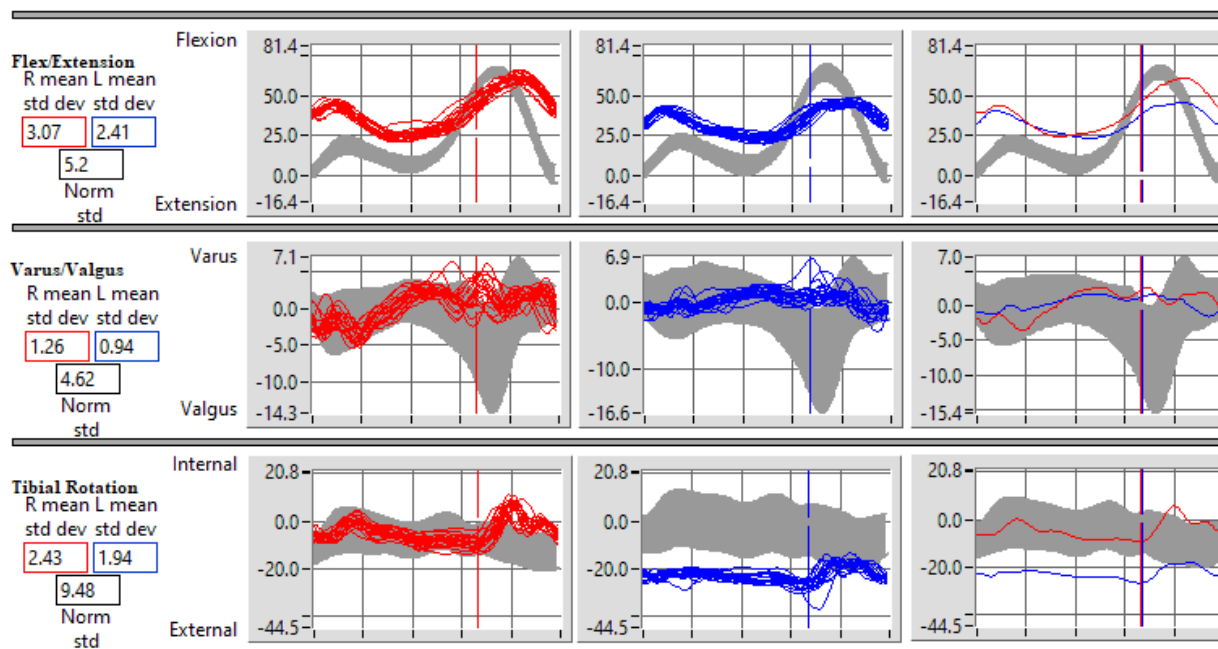
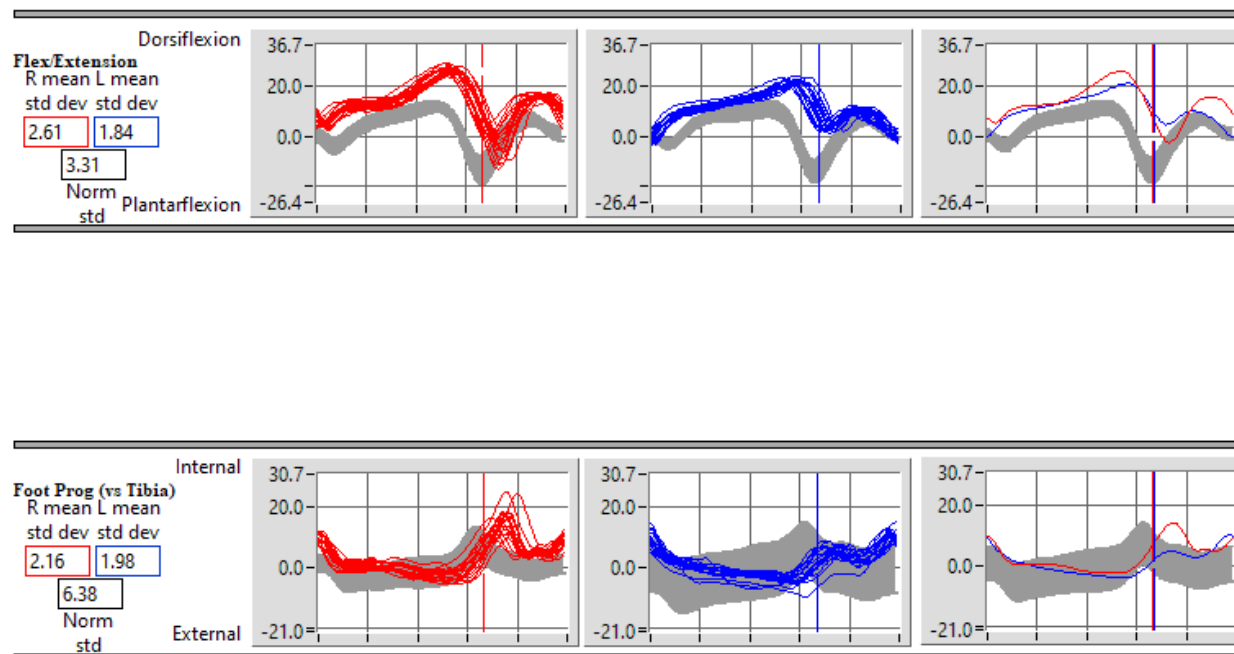
Figure 3. Postoperative Hip Kinematics**Figure 4. Postoperative Knee Kinematics**

Figure 5. Postoperative Ankle Kinematics**Figure 6. Postoperative Radiographs**