INSTITUTO DE ORTOPEDIA INFANTIL ROOSEVELT

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Dr Iván Carlos Uribe
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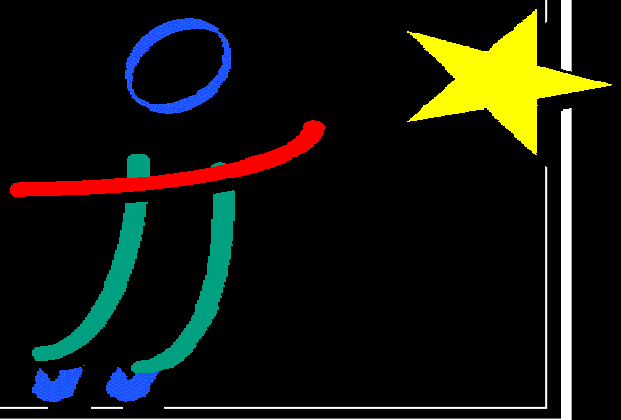
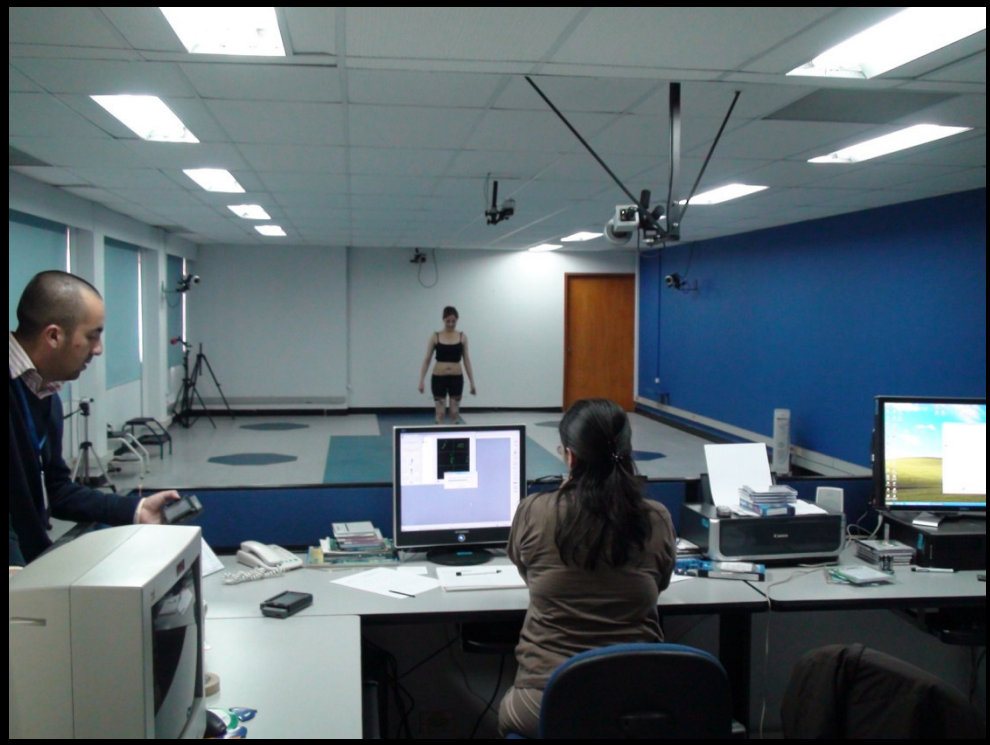


Staff of the Lab

- Terapist
  - Claudia Gonzalez
  - Magda Baquero
  - Edna Perez
- Ing
  - Jorge Puentes
  - Elsy Rodriguez
- Secretary
  - Esperanza Mesa
- Pediatric Orthopaedic Surgeons
  - Luis Eduardo Rueda
  - Jose Luis Duplat
  - Martha Valencia
  - Ivan Carlos Uribe



Equipment

- BTS ELITE
- 6 optoelectronic cameras
- 3 video cameras
- 2 AMTI force platforms, fixed on floor.
- Free EMG
- Baropodography

Equipment

- ELITE Clinic, Smart Tracker V1.0
- MyoLab
- Digivec
- FileMaker Pro Network
- Protocol: Davis
  - Working in Upper Limb: Rab
  - Foot protocol
- 3 – 4 patients / day

Problems in the Lab

- Digivec software
- Free EMG config
- Work with platforms
- .dbt files, .tdf files

Effect of TRAMA project

- Research other fields than just gait
- Learning to use software we have
  - Smart Analyzer
- Avoid square thinking

Hip extension osteotomy

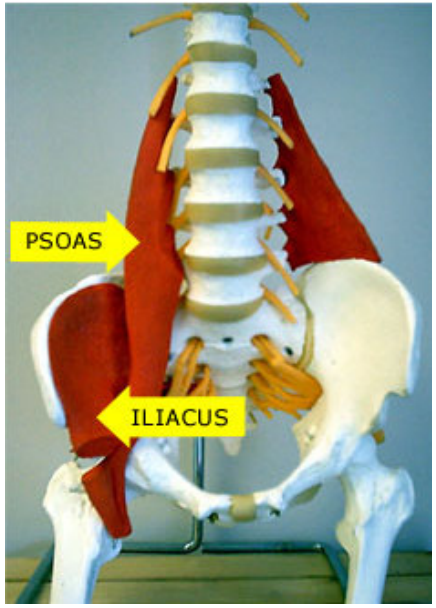
- Lower limb multilevel surgery is used in cerebral palsy walking patients.
- Poor improving with: Sometimes worse after surgery.
  - Hip flexion deformity.
  - Anterior pelvic tilt.

Hip extension osteotomy

- Looking a modification in intertrochanteric osteotomy (2004) = add an extension effect.

  We want to evaluate the results with this technique up to now compared with the traditional intertrochanteric proximal femoral osteotomy.

Technique


PSOAS
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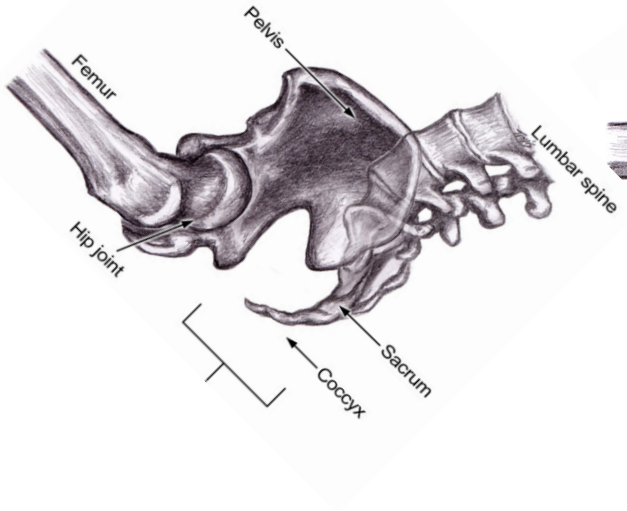
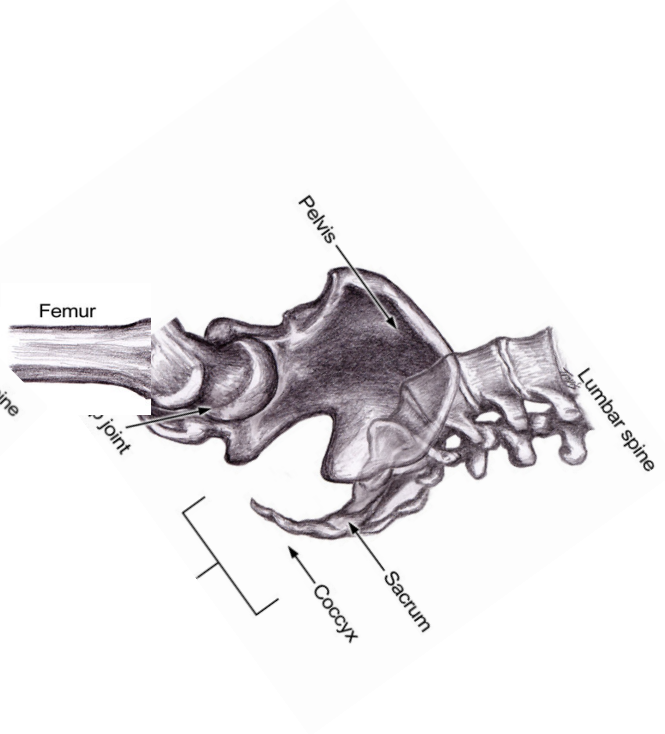
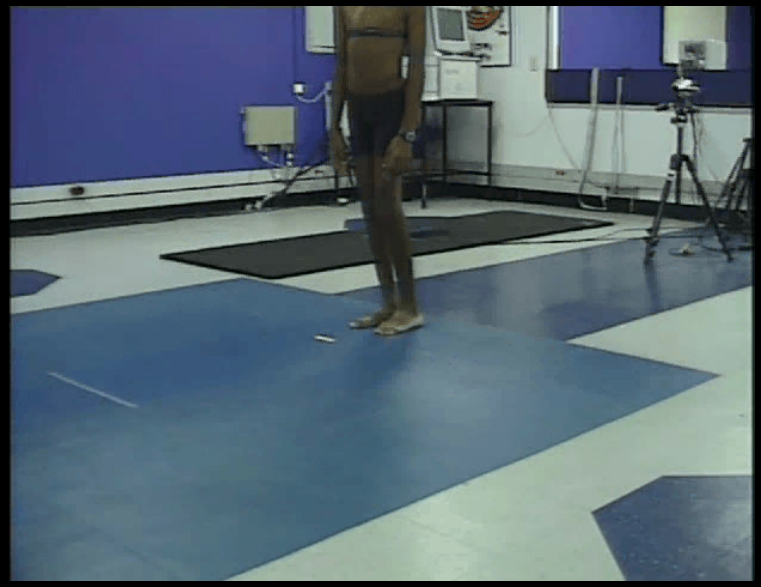

Pelvis
Femur
Lumbar spine
Hip joint
Sacrum
Coccyx


Pelvis
Femur
Lumbar spine
Sacrum
Coccyx

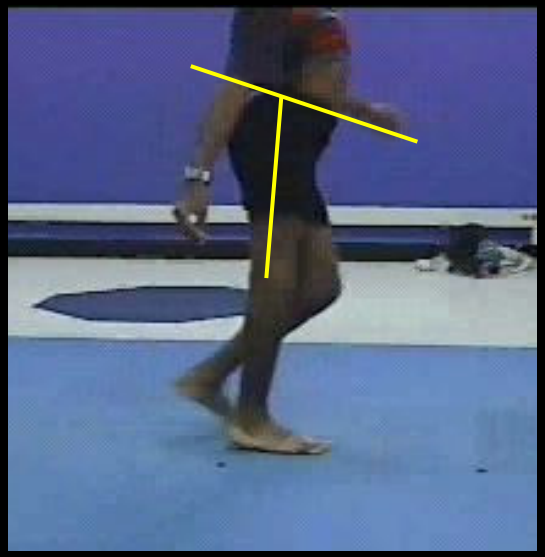
Multilevel surgery (Proximal femur intertrochanteric rotation osteotomy)

PREOP



POSTOP

Multilevel surgery (Proximal femur intertrochanteric rotation osteotomy)



PREOP

POSTOP

QUESTION

- ¿Is more effective the proximal femur *extension* osteotomy rather than the proximal femur *rotation* osteotomy to improve the hip flexion deformity in patients with cerebral palsy comparing Davis protocol parameters in gait analysis?

Selection criteria

- Patients with spastic cerebral palsy
- Be able to walk
- Previous proximal femur intertrochanteric surgery to improve hip flexion deformity
- Without intrapelvic psoas tenotomy

What we expect:

- Obtain a better active and pasive hip extension.
- Improve the pelvic tilt with extension osteotomy that let us to recomend the use to treat this deformity in cerebral palsy patients who are able to walk.

GENERAL AIM

- Evaluate the effect of the proximal femoral extension osteotomy to improve the hip flexion deformity, using the clinical evaluation and gait analisys in patients with spastic cerebral palsy treated at Roosevelt Institute since 2004.

SPECIFIC AIM

- 1- Determinate the clinical improvement in hip flexion deformity meassuring preop and postop results
- 2- Kinetic and Kinematic pelvic and hip behavior preop and postop using the HFI (Hip Flexor Index)
  - Rango tilt pelvico
  - Tilt pelvico maximo
  - Max extension cadera
  - Tiempo crossover (momento)
  - Poder H3

SPECIFIC AIM

- 3 – Evaluate the changes in time and distance parameters with both surgery techniques
- 4 –Deteminate if this correction obtained with this technique last in time.
- 5 –Describe a surgical technique been able to reproduce it as an alternative to treat hip flexion deformity in patients with cerebral palsy.

TYPE OF STUDY

- Descriptive
- Case series comparation

DATABASE

KINEMATICS

				Derecha		Izquierda		BASCULACION PELVICA										EXTENSION MAXIMA			
								Derecha				Izquierda				Promedio				Derecha		Izquierda	
								Preqx		Postqx	Max	Preqx	Max	Postqx	Max	Preqx	Der	Postqx	Der				
				Preqx	Postqx	Preqx	Postqx	Max	Min	Min		Min		Min		Izq		Izq		Preqx	Postqx	Preqx	Postqx
113579	8	M	Triparesia Espastica	6	6	4	4	19	12	13	8	19	17	15	11	15,5	18	10,5	13	8	11	1	-2
91922	6	M	Triparesia Espastica	22	12	24	12	16	14	15	10	19	14	12	8	15	16,5	12,5	10	4	6	-2	9
95689	6	F	Diplejia Espástica	24	6 18	20	19 24	27	19	20	18 15 9	26	14	22	18 16 9	23	20	17.5	13.5 19 13.5	8	4 5	2	(-)4 (-)5
123382	8	F	Hemiparesia Der	18	16	16	20	19	11	20	10	21	14	19	10	15	17,5	15	14	-18	-10	-11	-8
113035	6	M	Hemiparesia Der - Disquinesia	16	8	-	-	18	0	15	4	-		-		18	---	9,5	---	-4	4	-	-
112091	6	F	Diplejia Mixta	4	8	4	4	17	8	22	15	17	8	20	15	12,5	12,5	18,5	17,5	-10	-10	-19	-17
74949	12	F	Triparesia Espastica	28	12	10	22	45	36	35	24	45	35	25	23	40,5	40	29,5	24	-20	-6	-15	-14
72238	12	M	Triparesia espástica	26	16	22	10	16	12	13	7,5	18	18	13	11	14	18	10.2	12	6	8	17	5
1076413	6	M	Cuadriparesia Espastica	8		12		17	10			17	8			13,5	12,5			0		4	
123714	8	F	Hemiparesia espastica derecha	12		0		19	9			20	9			14	14,5			4		6	

DATABASE

KINETICS

Cross Over

Potencia de flexores

				Preqx	Postqx	Preqx	Postqx	Preqx	Postqx	Preqx	Postqx	Preqx	Postqx	Preqx	Postqx
113579	8	M	Triparesia Espastica	6	6	4	4	16	25	25	25	200	170	100	50
91922	6	M	Triparesia Espastica	22	12	24	12	NO TIENE							
95689	6	F	Diplejia Espástica	24	6 18	20	18 24		(2) 20		(2)30		(2)50		(2)50
123382	8	F	Hemiparesia Der	18	16	16	20	NO TIENE							
113035	6	M	Hemiparesia Der - Disquinesia	16	8	-	-	-	25	-	28	-	75	-	50
112091	6	F	Diplejia Mixta	4	8	4	4	NO TIENE							
74949	12	F	Triparesia Espastica	28	12	10	22	33	NT	39	NT				
72238	12	M	Triparesia espástica	26	16	22	10	NO TIENE							
1076413	6	M	Cuadriparesia Espastica	8		12		30		30		150		100	
123714	8	F	Hemiparesia espastica derecha	12		0		NO TIENE							

PRELIMINARY RESULTS

THOMAS SIGN

Signo de Thomas			
Derecha		Izquierda	
Preqx	Postqx	Preqx	Postqx
6	6	4	4
22	12	24	12
24	6 18	20	18 24
18	16	16	20
16	8	-	-
4	8	4	4
28	12	10	22
26	16	22	10

AVERAGE
RIGHT HIP:
PREOP: 18 DEGREES
POSTOP: 10.5 DEGREES

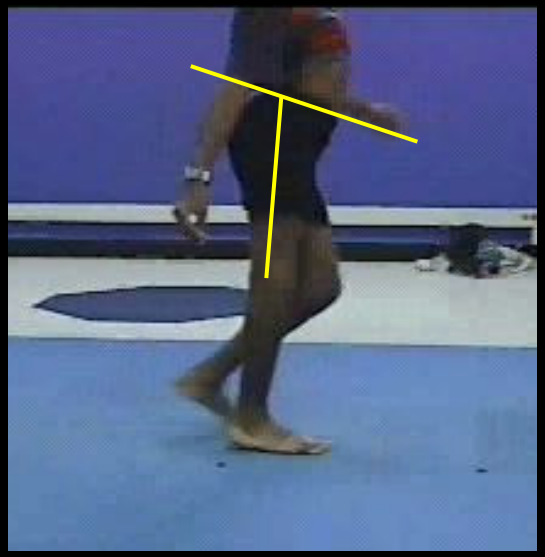
LEFT HIP:
PREOP: 14.28
POSTOP: 12.85

PELVIC TILT

Promedio			
Preqx		Postqx	
Der	Izq	Der	Izq
15,5	18	10,5	13
15	16,5	12,5	10
23	20	17.5 13.5	19 13,5
15	17,5	15	14
18	---	9,5	---
12,5	12,5	18,5	17,5
40,5	40	29,5	24
14	18	10.2	12

AVERAGE
Right hip:
Preop:19
Postop:15.4
Left hip:
Preop:20.3
Postop:15.6

Multilevel surgery
(Intertrochanteric rotation osteotomy)



PREOP

POSTOP

Multilevel surgery
(Intertrochanteric extension osteotomy)

PREOP

POSTOP

Multilevel surgery
(Intertrochanteric extension osteotomy)

PREOPERATORIO

POSTOPERATORIO

Working plan

- Complete data collection of the already included patients
- Increase the number of patients
- Apply the hip flexor index once completed the number of patients included.

Other Projects

- Ground reaction force vector
  - Amputees
  - Flat foot orthoses
- Upper limb
- Foot patology (Pes cavus, Talipes equinovarus)
- Foot alignment device
- Muscle length – OpenSim
- Technical protocols

THANK YOU