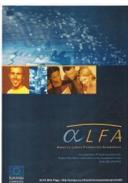




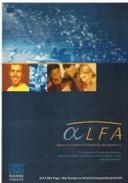
TRAMA: RESULTS EVALUATION

INTRODUCTION

Susana Lillo Sarno
Instituto de Rehabilitación Infantil Teletón
Santiago - Chile



Clinical Framework

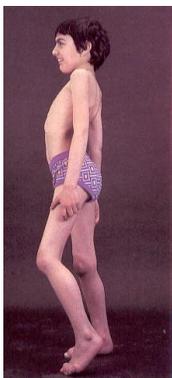


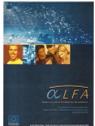
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 **TRAMA** TRAMing in Motion Analysis

Our Experience:
Establishment of gait profile of our patients

Duchenne Muscular Dystrophy Myelomeningocele




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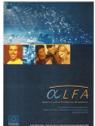
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Gait Profile of our Patients

Objectives

- ❖ Better understanding of the alterations mentioned in literature
- ❖ Determinate if the alterations found, are as described in literature (limited information)
- ❖ Analyse the evolution of our patients and compare with literature
- ❖ Establish profiles prior to treatment
- ❖ Help to improve rehabilitation and surgical treatments

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TRAMA TRÁNGULO
TRÁNGULO in Motion Analysis

Myelomeningocele: Gait Profile









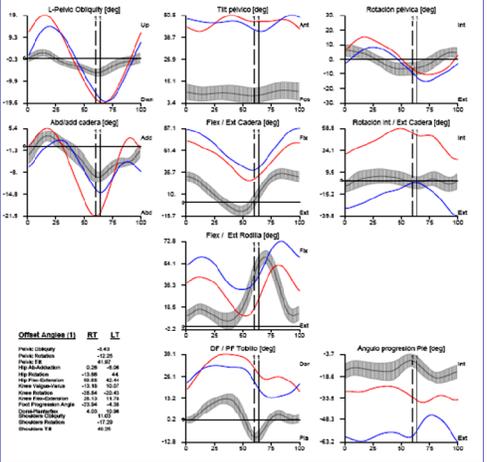
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TRAMA TRÁNGULO
TRÁNGULO in Motion Analysis

Myelomeningocele Lumbar- Sacral Level

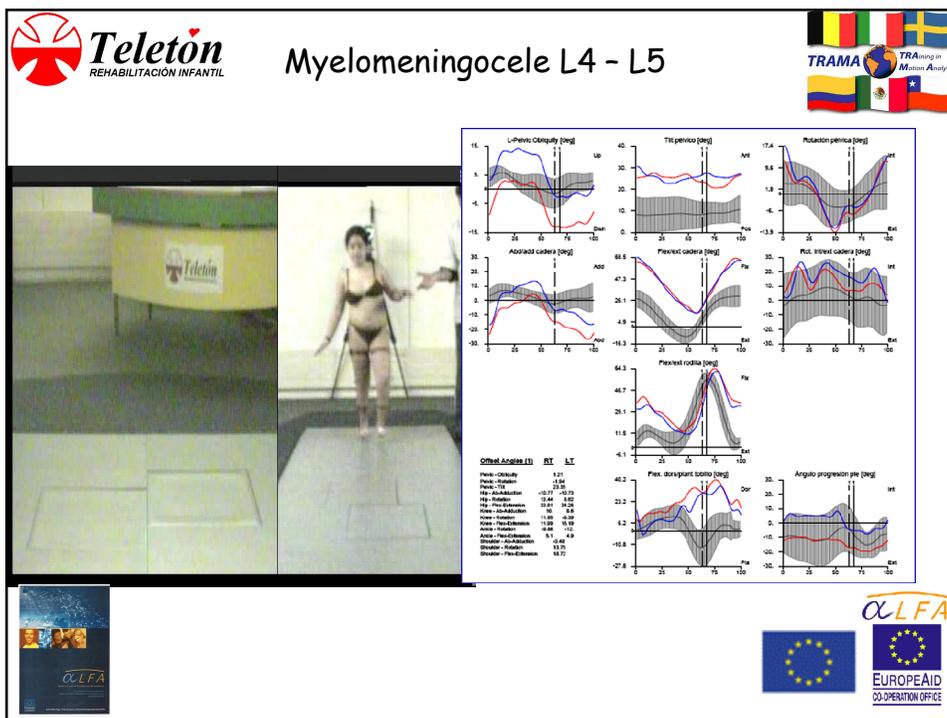
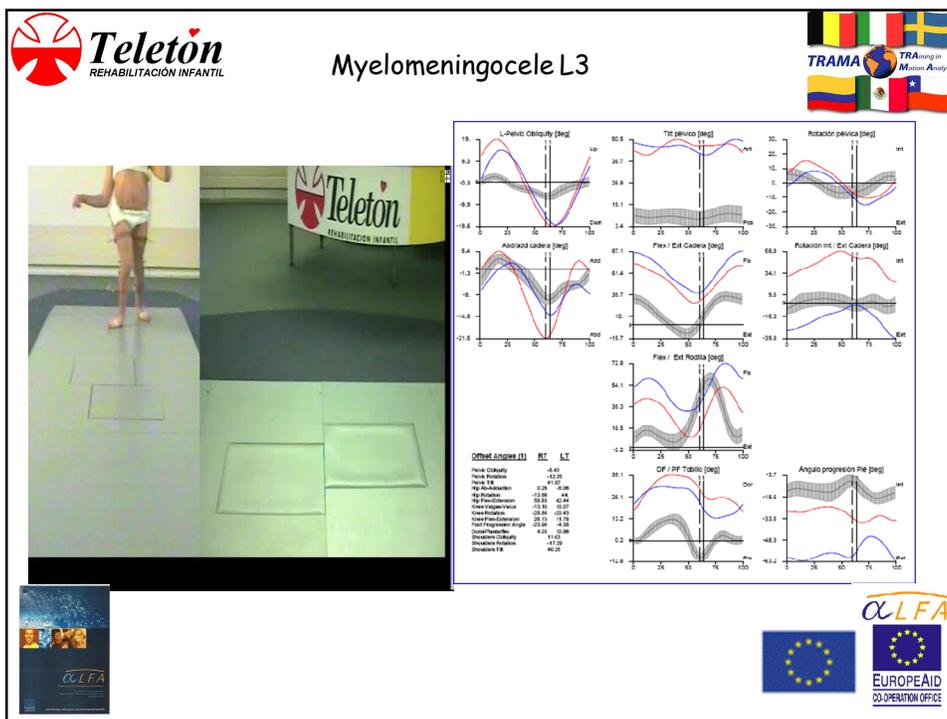
- ❖ **Pelvis:**
 - Increase of the oscillation in the coronal plane
 - Increase of the pelvic forward tilt in the sagittal plane
 - Increase of the pelvic rotation in the horizontal plane
- ❖ **Hips**
 - Flexion increased
- ❖ **Knees:**
 - Flexion increased in the Initial Contact
 - Less range of motion
- ❖ **Ankles:**
 - Dorsal Flexion increased

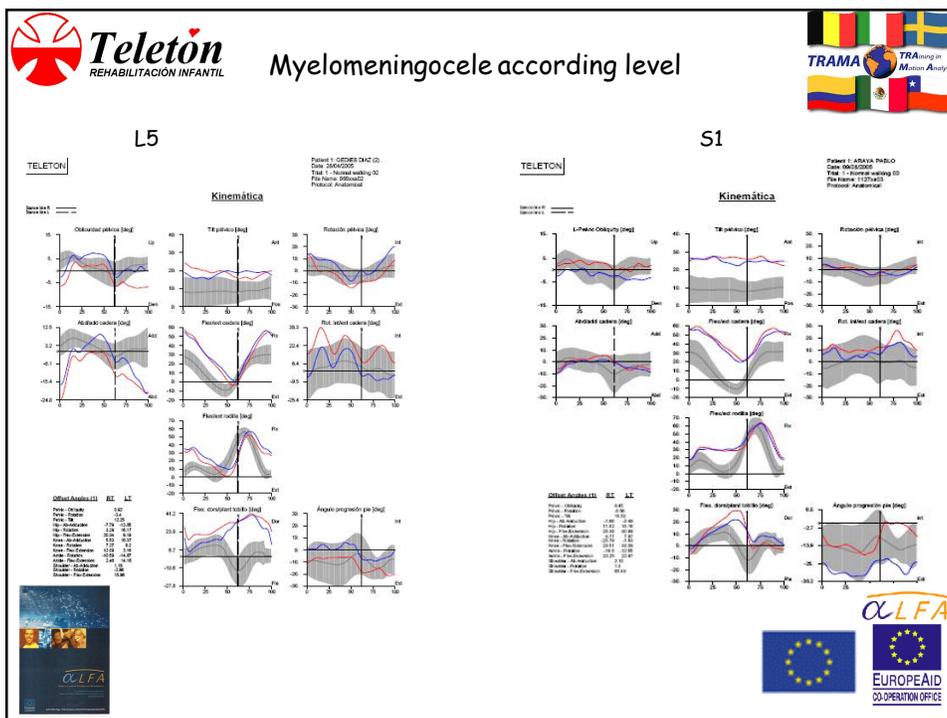
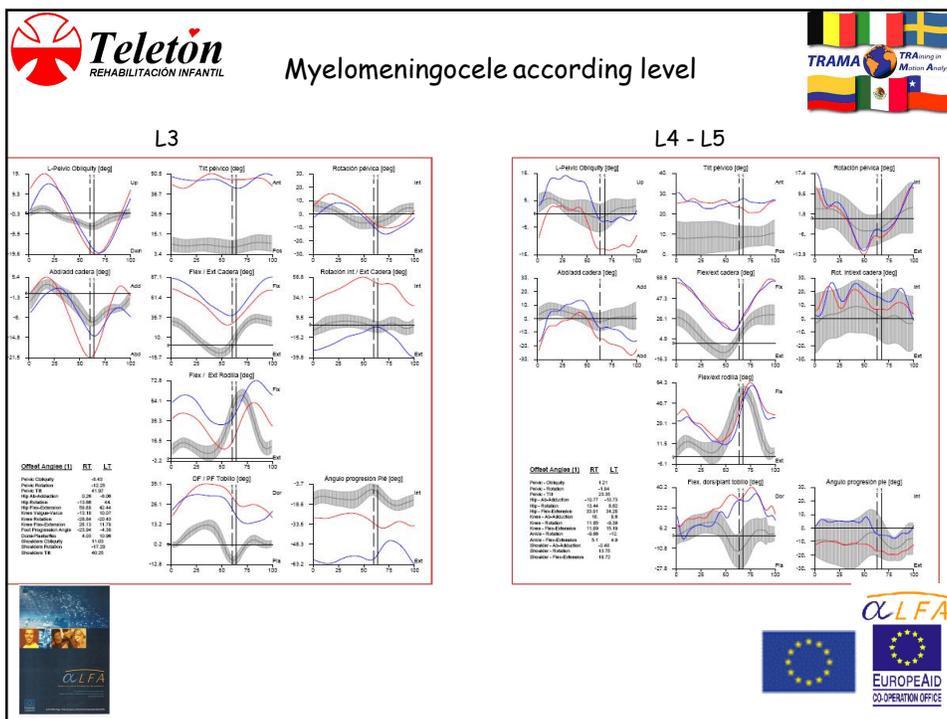


Offset Angles (1)	RT	LT
pelvic obliquity	-4.15	
pelvic rotation	-12.22	
pelvic tilt	4.74	
Hip AbAdduction	0.28	-6.38
Hip Rotation	-13.88	4.4
Hip Int. Extension	64.86	67.47
Knee Varus/Valgus	-15.49	32.37
Knee Flexion	-18.64	-24.62
Ankle Pronation/Supination	25.13	14.14
Foot Progression Angle	-12.84	-15.8
Calcaneus Tilt	4.91	11.22
Metatarsals Tilt	-17.23	
Straddle Flexion	65.35	











Myelomeningocele



- ❖ The result that we see in our experience agree with findings published in literature
- ❖ As the injury level is lower, these alterations decreases at:
 - Pelvis
 - Hips
 - Knees
 - Ankles
- ❖ The surgeries performed in our patients did not change their kinematic profile
- ❖ In children with asimetric level, the kinematic of the contralateral side is affected too as a compensatory phenomena








Myelomeningocele



Finding of an index of global evaluation, that will allow us to:

- “ Visualize in a curve, the kinematics characteristics of the gait of a patient, at the pelvis, hip, knee and ankle, at the sagital, frontal and transversal plane.
- “ Compare this characteristics with the normal subjects and, establish a correlation index, between the level lesions and the normal gait.
- “ Establish the magnitude of the difference, between normal gait and the gait of our patients.
- “ Measure the impact of therapies in the kinematic of all the articular points, that were evaluated at the same time, in a graphic and in a cuantitative way.
- “ Try to identify, if there are some kinematic points that are more representative than others, this will allow to acomplish evaluation with a reduced number of points.

CORRELATION COEFICIENT

Z SCORE








CORRELATION COEFFICIENT
Compare in a quantitative way two group of parameters, that are represented in an curve with identical physical magnitude.

Z SCORE
Measures the dispersion of each point of the patient curve in SD.



From 19 points of 7 curves of the Kinematic Data, we build:

CORRELATION COEFFICIENT

Z SCORE





Point of kinematic data



- 1) Ang of Ankle at initial contact
- 2) Peack Ankle dorasl flexion support phase
- 3) Ang of Ankle in Toe off
- 4) Ang of maximla dorsal flexion of ankle in swing phase.
- 5) Ang of Knee at initial contact .
- 6) Peak of knee at the loading response.
- 7) Ang of mínimal knee flexion at middle support.
- 8) Peack of máximal knee flexion in swing phase.
- 9) Ang of hip flexion at initial contact .
- 10) Ang of minimal hip flexion in midle support.
- 11) Ang of maximal hip flexion in swing phase.
- 12) Ang of pelvic at initial contact in frontal plane.
- 13) Peack of pelvic down in midle support.
- 14) Peack of pelvic up during swing.
- 15) Ang of pelvic rotation of pelvis at initial contact. (+ Internal rotation, - external rotation)
- 16) Ang of pelvic rotation in middle support. (+ Internal rotation, - external rotation)
- 17) Ang of pelvic rotation in terminal swing.
- 18) Ang of pelvic tilt at initial contact.
- 19) Ang of hip abb/add in support phase.

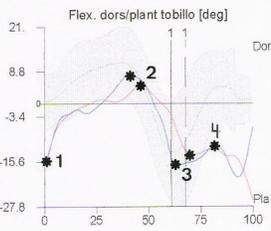




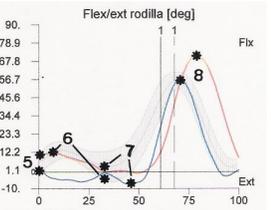


Ankle and knee

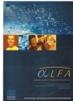




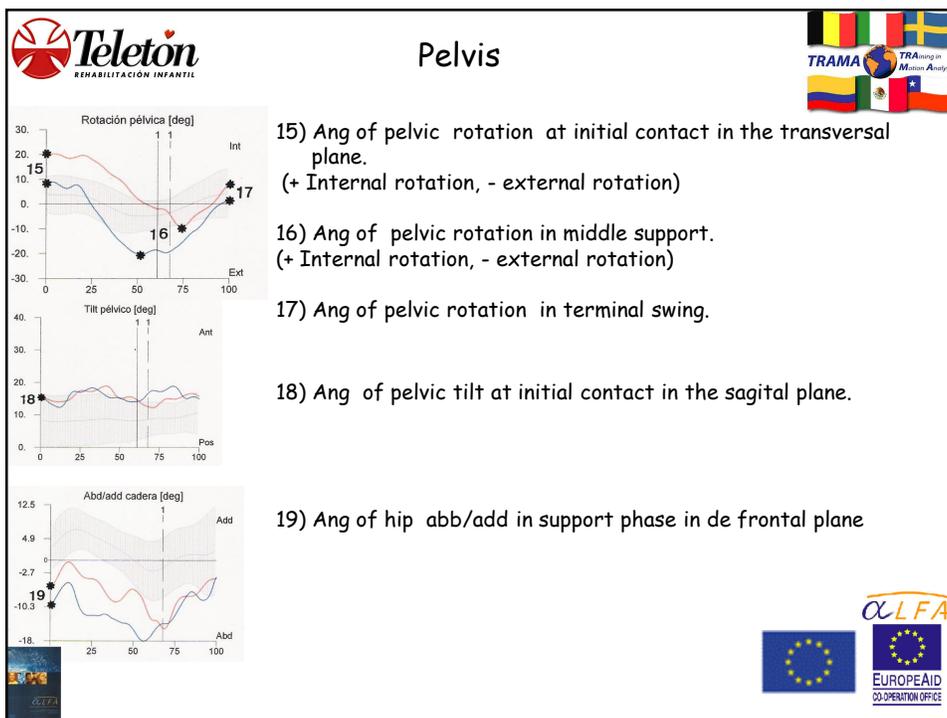
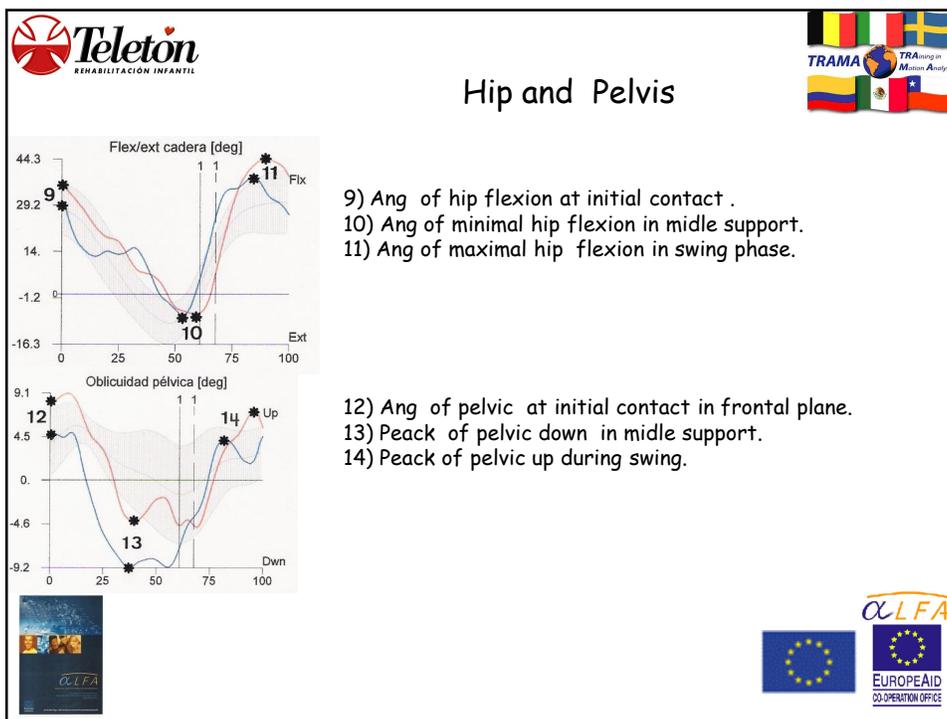
- 1) Ang of Ankle at initial contact
- 2) Peack Ankle dorsal flexion during support phase
- 3) Ang of Ankle in toe off
- 4) Ang of maximal dorsal flexion of ankle in swing phase.

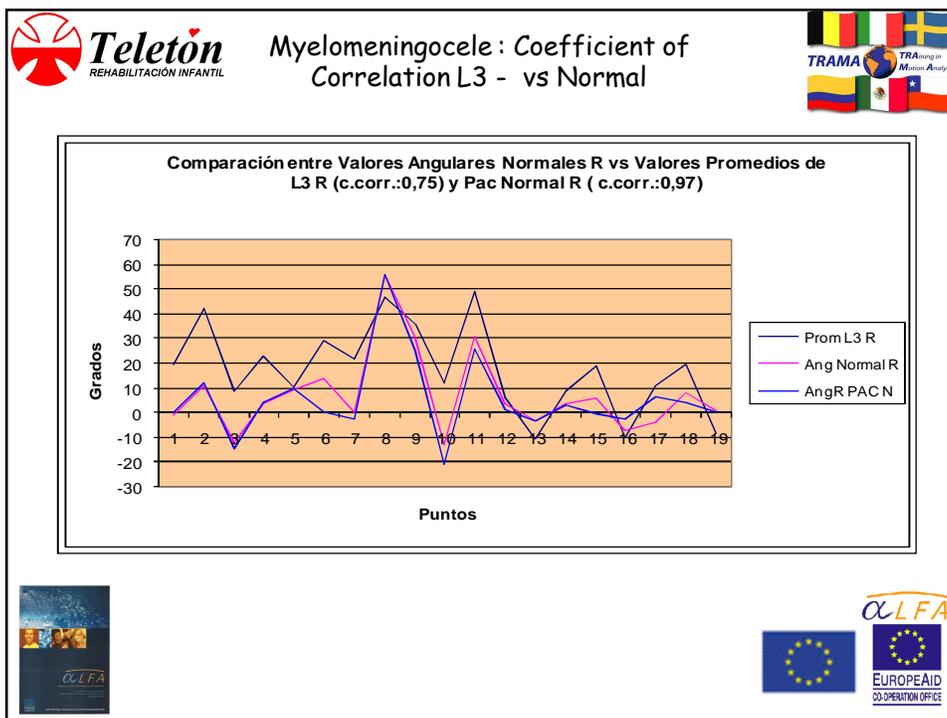
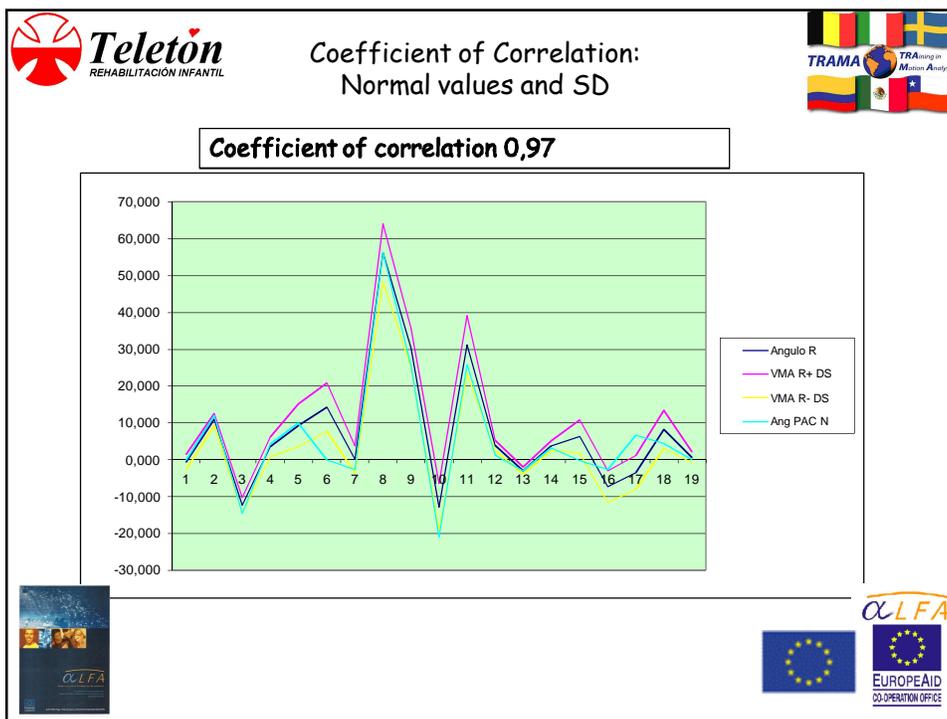


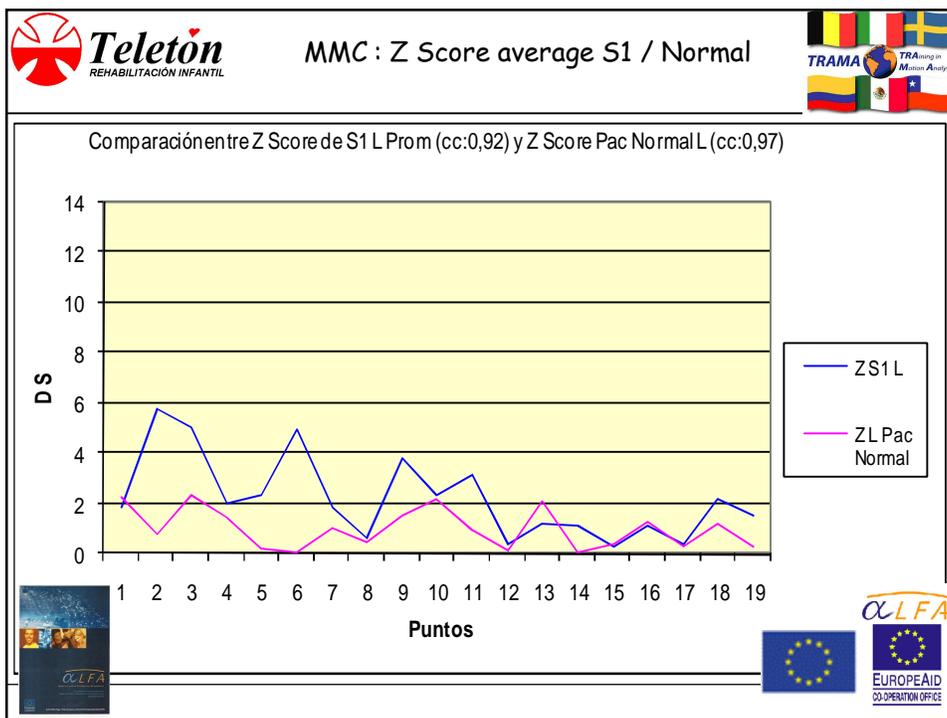
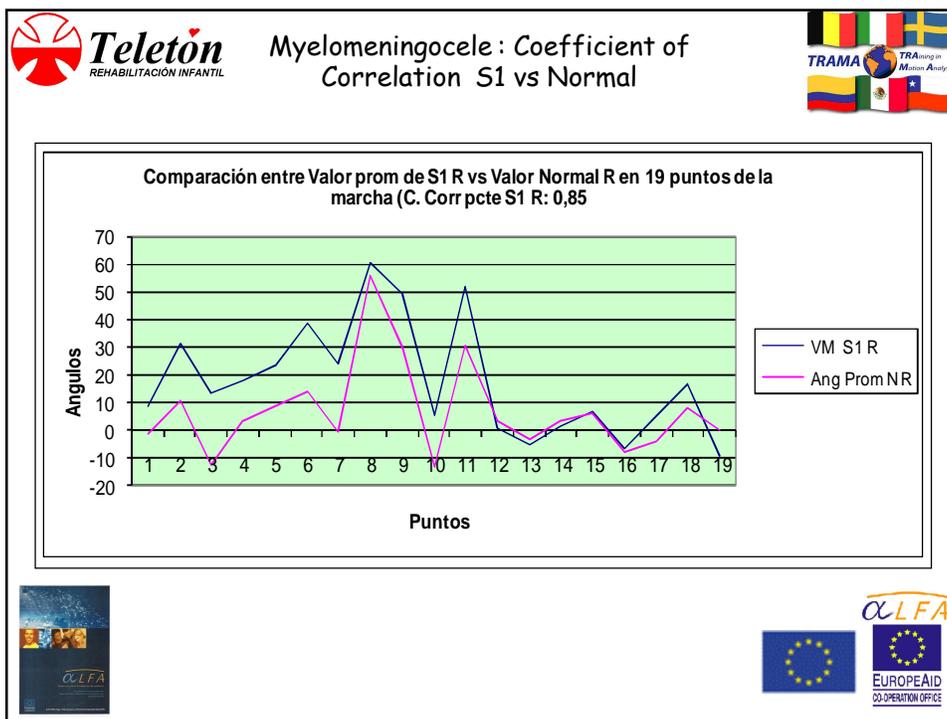
- 5) Ang of Knee at initial contact .
- 6) Peak of knee at the loading response.
- 7) Ang of mínimal knee flexion at middle support.
- 8) Peack of máximal knee flexion in swing phase.













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Mielomeningocele



TRAMA TRAMing in Motion Analysis

- “ There was a certain relation of the values of the Coefficients of Correlation, with the level of injury of our patients
- “ The Z-Score show that as the injury level is higher, were more SD of normal Z Score
- “ It was one case who inically was out of this behavior, but when we re analyzed the patient, we could see a mistake in the initial clasification of his level lesion

The Coefficient of Correlation and Z Score could be an useful index that will allow us to make an objective assesment of the gait in patients with MMC





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TRAMA TRAMing in Motion Analysis

Gracias





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Thesis

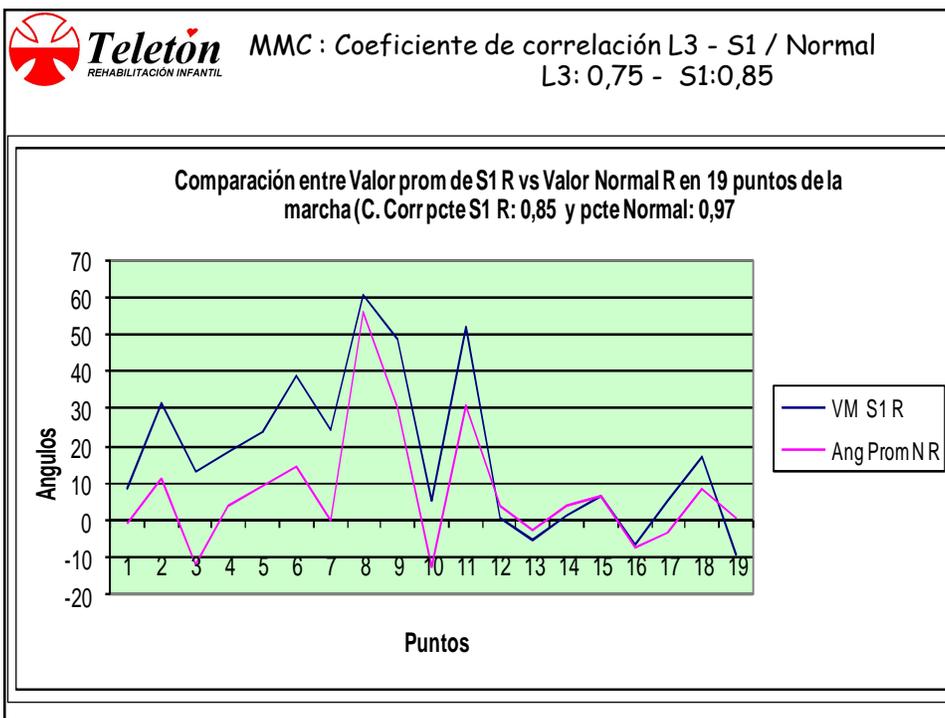
Problem definition:
 Nowadays we do not have an instrument that will allow us to make an objective assesment of the gait in patients with MMC, that will give global information about his basal behaviour.

That as the IN it will allow us to establish a correlltation between the behaviour and the normal subject.

That it will allow us to precise the dispersion of the patients with diferentes levels of MMC in comparison with the normal subject.

That it will allow us to establish its response to therapy in the levels of compromise in a cuantitative way.





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Myelomeningocele



TRAMA
TRAnsayn in Motion Analysis

- ❖ The AFO improved the gait on the Temporal and Distance Parameters and the Kinematics in sagittal plane

- ❖ The knee showed a moment of important overload at the higher levels. The use of cane as a preventive measure in the future must be considered

- ❖ The exercises would certainly benefit: velocity, cadence, anterior step length and the angle of anteversion of pelvis at the Initial Contact, although these improvements were not statistically significant in our experience



