

KNEE MEGAPROSTHESIS IN PATIENTS AFFECTED BY MALIGNANT TUMORS OF DISTAL PART OF THE FEMUR: STUDY OF THE KINEMATIC ALTERATIONS AND MUSCLE ACTIVATION PATTERNS DURING GAIT

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AIM

Functional evaluation through instrumented gait analysis of patients with *knee megaprosthesis*, focusing on the *asymmetries* between the prosthetic and the sound side

METHODS

24 patients (age: 40 ± 18 years)

Time from surgery: 5 ± 3 years

Foot-switches

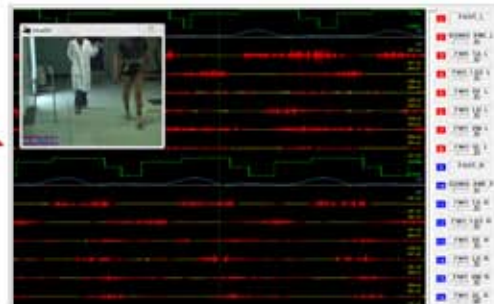
Knee electrogoniometers

EMG probes:

- Tibialis Anterior
- Gastrocnemius Lateralis
- Rectus Femoris
- Lateral Hamstrings
- Vastus Medialis
- Vastus Lateralis



Gait analysis



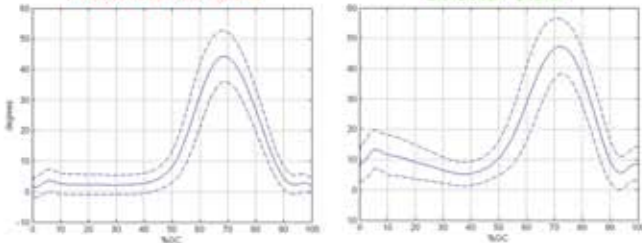
Gait signals

Knee kinematics
EMG activations

RESULTS

PROSTHETIC SIDE

SOUND SIDE



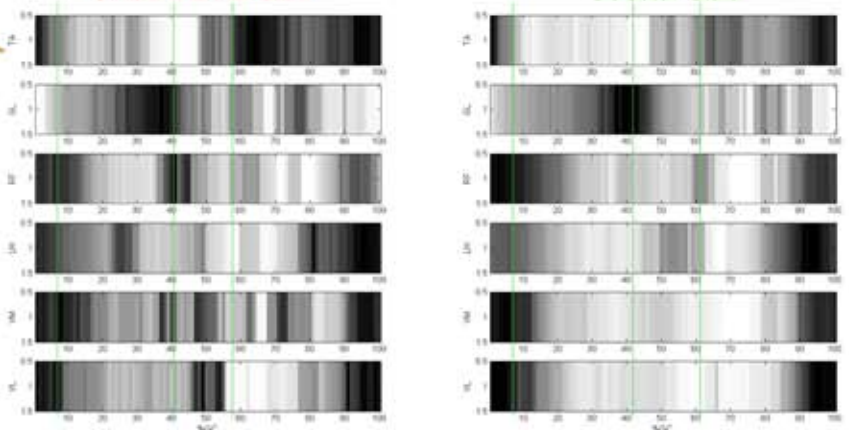
Reduction in knee flexion during the load acceptance phase in the prosthetic side with respect to the controlateral

Alterations in the EMG activation patterns in the prosthetic side with respect to the controlateral:

- TA: more consistent activation in swing
- GL: slightly anticipated activation
- RF: more consistent activation around 40% GC to stabilize hip joint
- LH: consistent activation around 25% GC
- VM and VL: large variability of EMG patterns depending on the different muscular sacrifice

PROSTHETIC SIDE

SOUND SIDE



CONCLUSIONS

Instrumented gait analysis allowed *quantitative description of gait asimmetries* of patients with knee megaprosthesis by evaluating the *knee kinematics* and the *muscle activation patterns*