The factors of good compliance are continence and autonomy regarding the introduction of the catheter. Nevertheless, self-catheterization can be difficult because of the usual shortcomings associated with bladder and sphincter disorders (motor, sensory...). We found only one study about one adaptive equipment to facilitate the gesture for monoplegic patients. 

**Observations** This case report concerns a 53-years-old man, left brachial amputated in 1987 because of a motorbike accident associated with primitive progressive multiple sclerosis since 1996. He has an overactive bladder syndrome and dysuria because of a detrusor sphincter dyssynergia and overactive detrusor. Treatments by alpha blockers then TENS on the tibial posterior nerve and finally neuromodulation of the posterior sacral roots did not succeed. The indication of self-catheterization was chosen and the patient’s education was organized in Physical Medicine and Rehabilitation unit in University Hospital of Rangueil. The team of therapists has manufactured adaptive equipment to enable the learning of intermittent self-catheterization despite his amputation. It consists in the realization of a thermo-formed plastic penile support, with a central channel to support the penis and a curved base on both sides for holding the device between the thighs. It was a success and the patient was able to independently urinary catheterism with one hand while the device correctly maintained his penis.

**Discussion/Conclusion** Three months later, he no longer needed this assistance. To conclude, it can be be concluded that a multidisciplinary management allowed a monoplegic patient to acquire the self-catheterization technique, avoiding him to undergo surgical treatment.

**Disclosure of interest** The authors declare that they have no competing interest.

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**PO06**

**Articulated vs. fixed carbon-fiber prosthesis in individuals with partial foot amputation: Study case**

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**Objective** Toe filler combined to ankle-foot orthosis (AFO) can be used to improve gait after a partial foot amputation. The AFO supports the plantar aspect of the foot, and the toe filler gives a longer lever arm that helps for pivoting over the lost metatarsals. However, the AFO type can influence gait parameters. The objective of this study case was to evaluate the effect of prosthesis with toe filler combined to:

- an articulated AFO;
- a fixed carbon-fiber AFO on gait.

**Patients and methods** A gait analysis was practiced on a 20-year-old male with a partial foot amputation. Kinematic and kinetic data during walking, gait efficiency (Energy Expenditure Index), and postural control were evaluated in both conditions.

**Results** An improved ankle power was observed at toe-off with the fixed carbon-fiber AFO. Moreover, spatiotemporal gait parameters were more symetrical with the fixed carbon-fiber AFO. Gait efficiency was higher with the fixed carbon-fiber AFO compared to the articulated one.

**Discussion/Conclusion** The fixed carbon-fiber AFO improves ankle kinematic and kinetic during walking and results in an improvement of walking efficiency in this participant with partial foot amputation.

**Disclosure of interest** The authors declare that they have no competing interest.

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**PO07**

**Modelisation of the action of compression bandages on the lower limb**

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**Objective** Compression bandages are commonly used in the treatment of some venous or lymphatic pathologies. The success of the treatment relies on the applied pressure, which depends on several parameters, especially the bandage properties but also patients’ morphology.

A previous experimental study showed that considering only patient’s morphology and bandage elastic properties were not sufficient to explain interface pressure distribution. However, these two parameters are the only one taken into account in Laplace’s Law, current standard method to explain interface pressure distribution. The objective of the study is to characterize and model compression bandages pressure generation mechanisms.

**Material and methods** A patient-specific numerical simulation of 4 bandages application [Biflex® 16 and Biflex® 17 (Thausne)] applied with 2 and 3 layers on the leg was developed for 5 subjects. The inputs of this simulation are the subjects’ morphology, the bandage’s and soft tissues’ elastic properties and the application technique.

The results of this simulation were then confronted to the experimental results and pressure values computed with Laplace’s Law: \( P = \frac{\pi T}{r} \), with \( P \) the pressure [N/mm²], \( T \) the tension [N/mm] and \( r \) the local radius of curvature [mm].

**Results** The numerical simulation provides the complete pressure distribution over the leg but also considers the deformations of the leg, induced by bandage application. The comparison with the results given by Laplace’s law highlighted the influence of these leg geometry changes on the applied pressure.

However, the 4 parameters considered in this simulation (leg morphology and deformations, bandage elastic properties and application technique) are not sufficient to completely explain pressure generation, and differences with the experiments still persist.

**Discussion/Conclusion** Numerical simulation still needs to be enriched to consider other parameters which may impact interface pressure such as bandage to bandage interaction for example.

**Disclosure of interest** The authors declare that they have no competing interest.

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