# THE EFFECT OF NEUROMUSCULAR ELECTROSTIMULATION IN RADIOCEPHALIC FISTULA MATURATION PROCESS

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## BACKGROUND

- Radio-cephalic arteriovenous fistula (RCAVF) is the gold standard vascular acces for end-stage chronic kidney disease patients.
- Clinical data regarding the role of neuromuscular electrostimulation (NMES) in AVF maturation have been reported.

## OBJECTIVE

Analyze the effect of a postoperative NMES programme on RCAVF maturation.

## MATERIAL AND METHODS

A 8 weeks single-center prospective study.

In RCAVF previously maturated with a NMES programme.

NMES was performed using Compex® Thetha 500i device

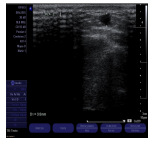
*Fig. 1. Patient with electrodes placed on the skin underwent low-intensity electrical stimulation in the forearm muscles of the RCAVF upper limb during HD session.*

Analyzed data:

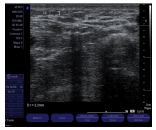
*1.-.Muscular strength ( Hand-Grip).*

*2.- Doppler US parameters*

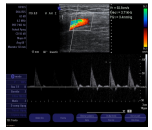
*Hand grip*



*Cephalic Vein Diameter*



*Radial Artery diameter*



*Humeral Artery Flow rate*

*3.- Clinical and DUS maturation*

*4 -.RCAVF complications*

## RESULTS

### DEMOGRAPHIC DATA

*11 ESG radiocephalic forearm fistula (RCAVF)*
*82% men*
*I. Charlson. 8.7 ± 3.9*
*Mean Age: 65.7 ± 19.2*

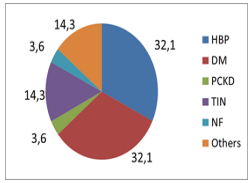
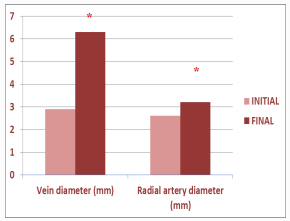



*Figure 2.- Main aethiology chronic kidney disease*

### VEIN AND RADIAL ARTERY DIAMETER




| | INITIAL | FINAL | P. VALUE |
|---|---|---|---|
| *Vein diameter (mm)* | *2.9 ± 0.8* | *6.3 ± 1.5* | *0,001* |
| *Radial artery diameter (mm)* | *2.6 ± 0.4* | *3.2 ± 0.6* | *0,028* |

** p< 0.05 ( Baseline – 8 weeks)*

### HUMERAL ARTERY FLOW RATE

| | INITIAL | FINAL | P. VALUE |
|---|---|---|---|
| *Humeral artery flow rate ( ml/min)* | *117.9 ± ± 33.1* | *970.2 ± 578.1* | *0,001* |

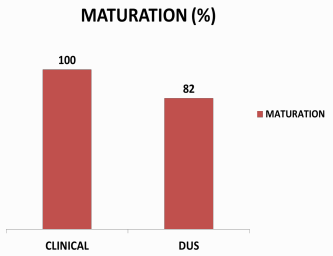
*A significant increase in vein, radial artery diameter and humeral artery flow rate was observed after NMES programme.*

### MUSCULAR STRENGHTH

| | START | FINAL | P. VALUE. |
|---|---|---|---|
| HG | *25.2 ± 0.4* | *25,6 ± 0.6* | *P 0.677* |

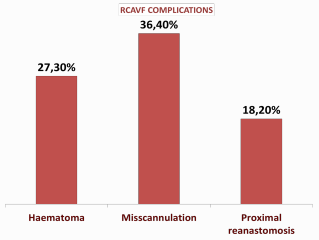
*No relevants diferences in HG was observed after NMES*

### CLINICAL AND DUS MATURATION




| CLINICAL MATURATION | DUS MATURATION |
|---|---|
| - VEIN PALPABLE, ANFRACTUOUS | -VEIN DIAMETER> 5-6mm |
| - SECTION > 500ml/min | -DEPTH< 6mm |
| - THRILL PALPABLE. | -HUMERAL ARTERIAL FLOW > 500ml/min |

### RCAVF COMPLICATIONS




*No adverse effects of NMES were registered*

## CONCLUSIONS

1.-. NMES programme of forearm muscles is a safe, effective technique to improve RCAVF maturation process in our patients

2.-. NMES constitutes a novel alternative to forearm isometrics exercises in RCAVF maturation.

3.- Nevertheless, further studies are requires to confirm the potential effect of NMES in the vascular access maturation process.