

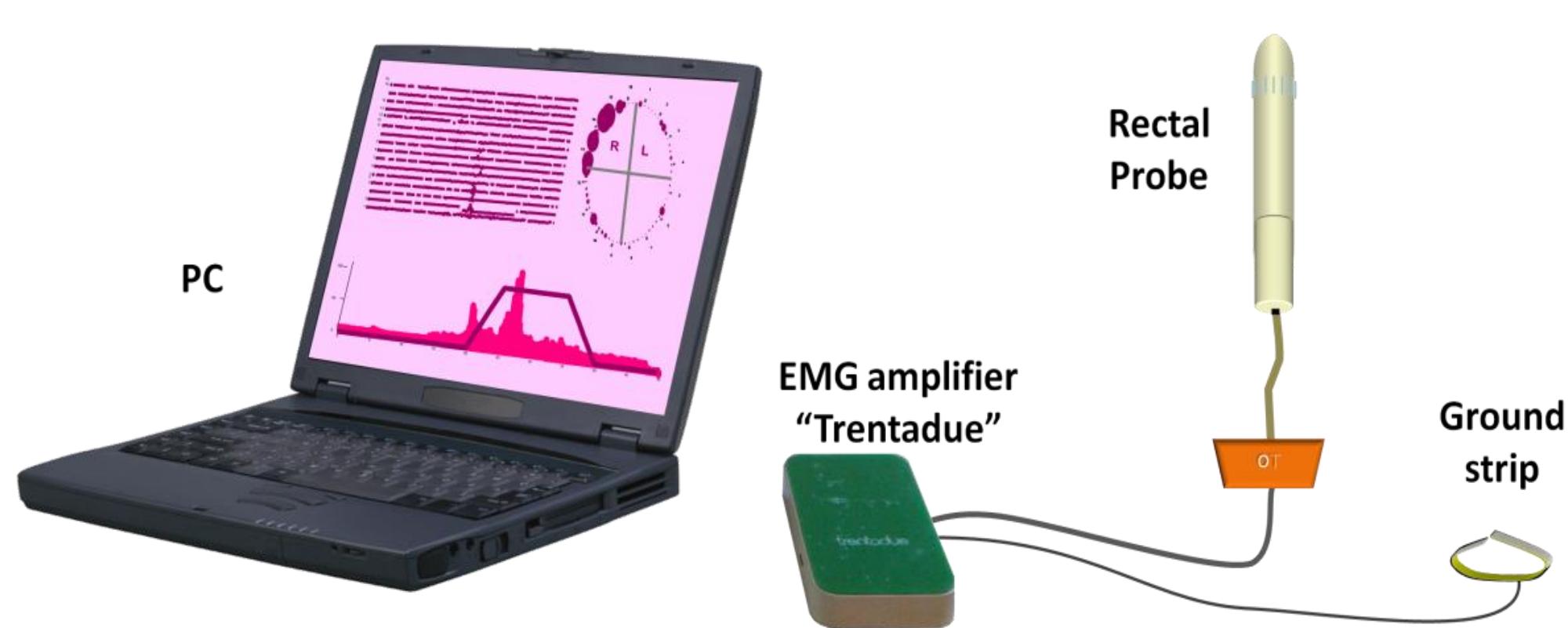
Should mediolateral episiotomy side be decided according to anal sphincter EMG?

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INTRODUCTION AND AIM OF THE STUDY.

Surface electromyography (sEMG) in obstetrics is a novel method for detecting the innervation of external anal sphincter (EAS). Recent studies suggest that **functional asymmetry** of pelvic floor innervation exists in healthy subjects, and it is strongly associated with postpartum incontinence if the trauma occurs on the dominant side of innervation. **Episiotomy** is the most common cause of perineal trauma during delivery, and the surgical incision is usually performed on the mediolateral right side. The aim of this study is to locate the IZs and to analyze their distribution, and to compare signal amplitude of EAS before and after delivery by the means of sEMG, in order to evaluate the effect of episiotomy on the external anal sphincter muscle activity.



MATERIALS AND METHODS.

In this prospective observational type study, 245 pregnant nulliparous women (age 29.1 ± 4.1 years) were involved. In order to detect the distribution of IZs and amplitude of EMG signals, **sEMG was performed of EAS two times**: during the 2nd trimester of pregnancy and 8 weeks after delivery. Questionnaires to detect obstructive defecation syndrome and anal incontinence were fulfilled during both visits. Also endoanal ultrasound was performed during the visits to exclude possible sphincter damages. EMG signals were detected by a cylindrical probe with 16 electrodes and acquired with a multichannel amplifier (OT Bioelettronica, Turin, Italy).

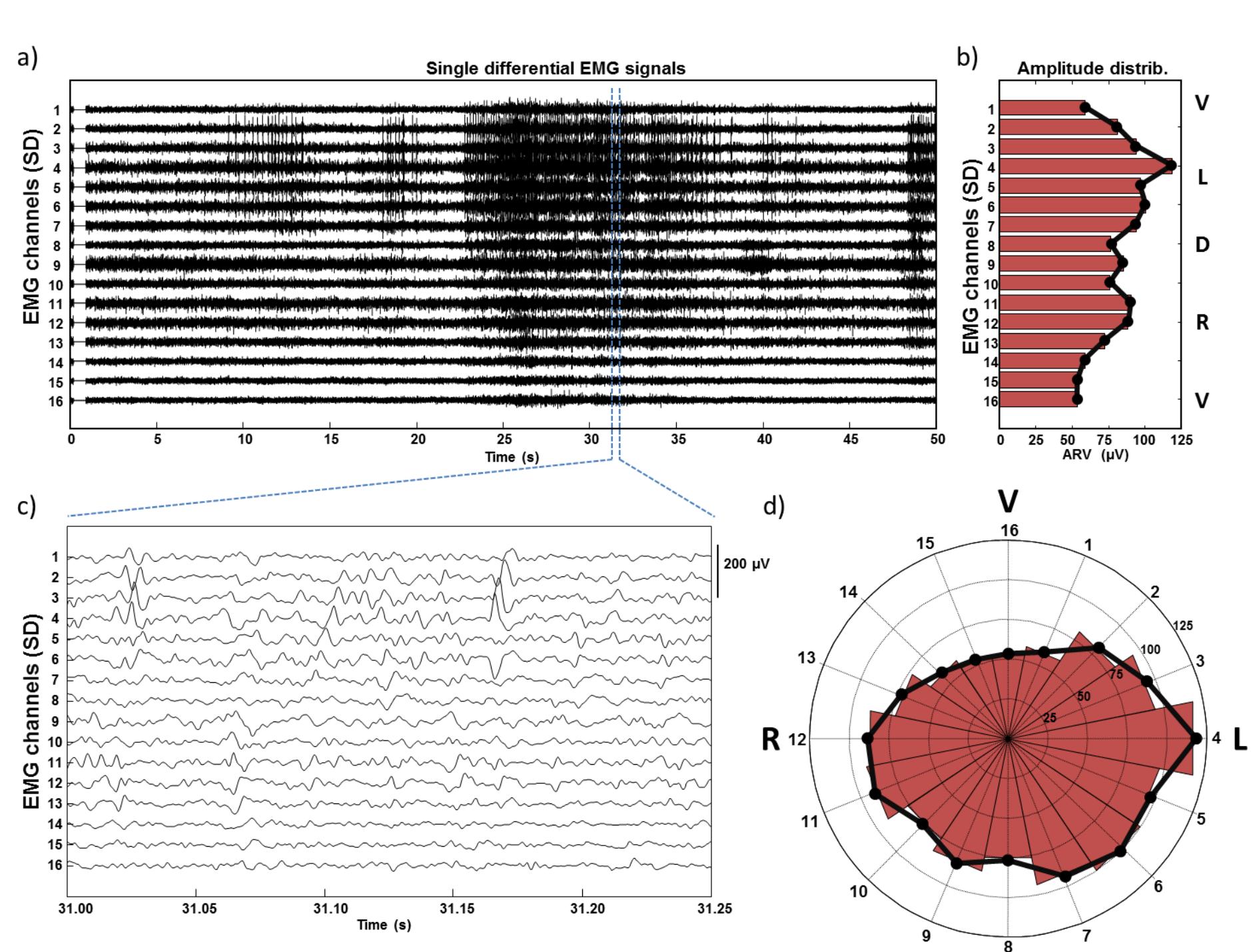
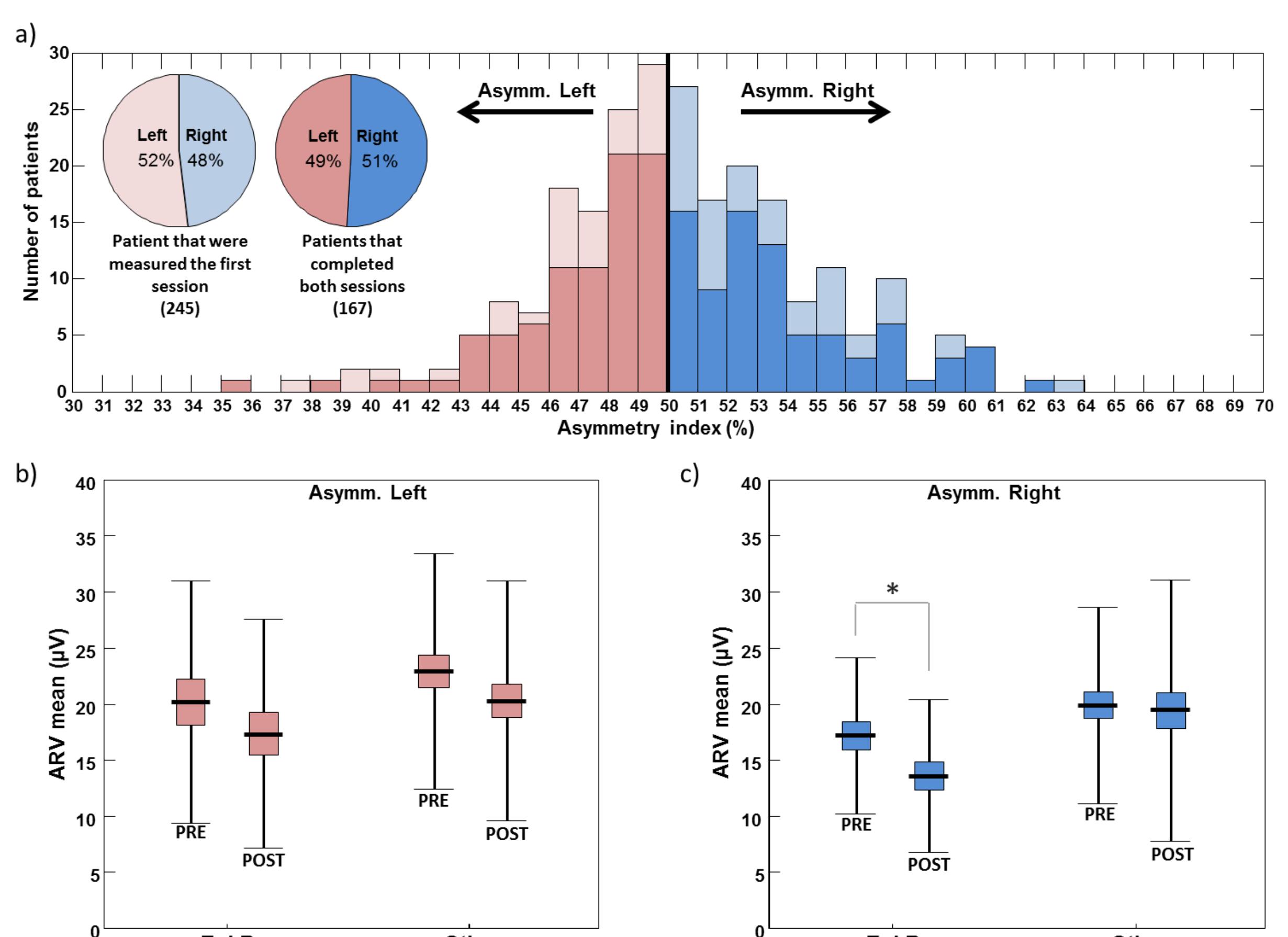
RESULTS.

Figure a) shows the **distribution of asymmetry index (AI)** values for the 245 subjects measured before delivery. In darker colors is represented the distribution of AI values before delivery of the women that afterwards completed both measurement sessions.

Figures b) and c) **comparison of mean global ARV** (averaged on all channels during maximal voluntary contraction (MVC) before and after delivery for women who had episiotomy versus other types of delivery (spontaneous lacerations, Caesarean sections, no damage).

The women are divided in two groups according to the AI (left or right). **The only significant amplitude change is for women right asymmetric who had episiotomy on the right side.**

167 women after delivery (68% of the total) were included in the analysis: 58 (35%) of them had episiotomy on the right side, 54 (32%) had spontaneous lacerations, 19 (11%) had no damage, and 36 (22%) had Caesarean section



CONCLUSIONS.

Significant change in EMG amplitude after delivery was observed in the women who had amplitude asymmetry on the right side and underwent mediolateral right episiotomy. Superficial electromyography showed to be a promising method for detecting innervation zones before delivery to avoid iatrogenic damage of pelvic floor innervation.

REFERENCES

- Cescon C., Riva D., Zacesta V., et al., Effect of vaginal delivery on the external anal sphincter muscle innervation pattern evaluated by multichannel surface EMG: results of the multicentre study TASI-2. International Urogynecology Journal 2014
- Enck P., Franz HBO., Aspiroz F., et al., Innervation zones of the external anal sphincter in healthy male and female subjects: Preliminary results. Digestion. 2004
- Wheeler, T.L. & Richter, H.E., Delivery method, anal sphincter tears and fecal incontinence: new information on a persistent problem. Current opinion in obstetrics & gynecology. 2007