

# Identification of the epidural space: a double blind comparison between the CompuFlo® Epidural Computer Controlled System and the standard LOR to saline technique in obstetrics

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## Background and Goal of Study:

CompuFlo® Epidural Computer Controlled System (CF) is a new device capable of injecting fluids with a precise rate and pressure setting. The pressure is displayed in real time visually and with a corresponding audible tone that reflects the pressure data. A pilot study (1) demonstrated that CF can be used to identify the epidural space but did not compare this new method to the conventional technique. The purpose of our study was to compare the agreement between the identification of the ligamentum flavum and of the epidural space performed by a blindfolded anesthesiologist with the pressures recorded by the CompuFlo device

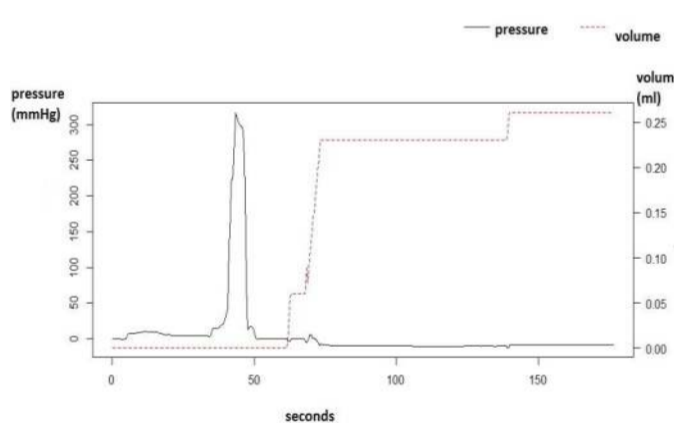
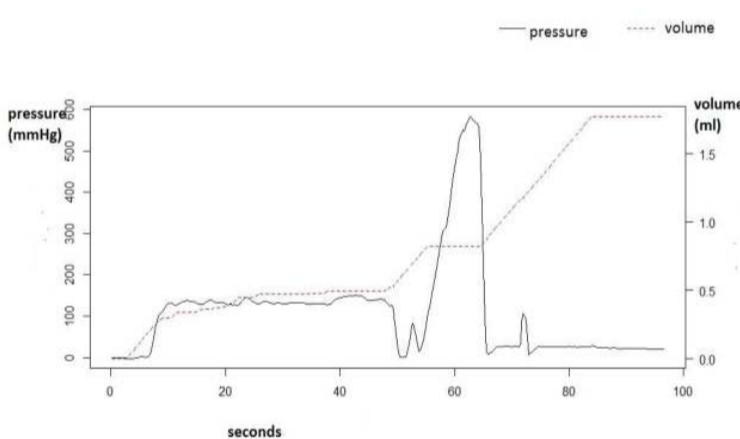


## Materials and methods

After EB approval and informed consent, we enrolled 29 healthy parturients undergoing elective cesarean section or labor analgesia.

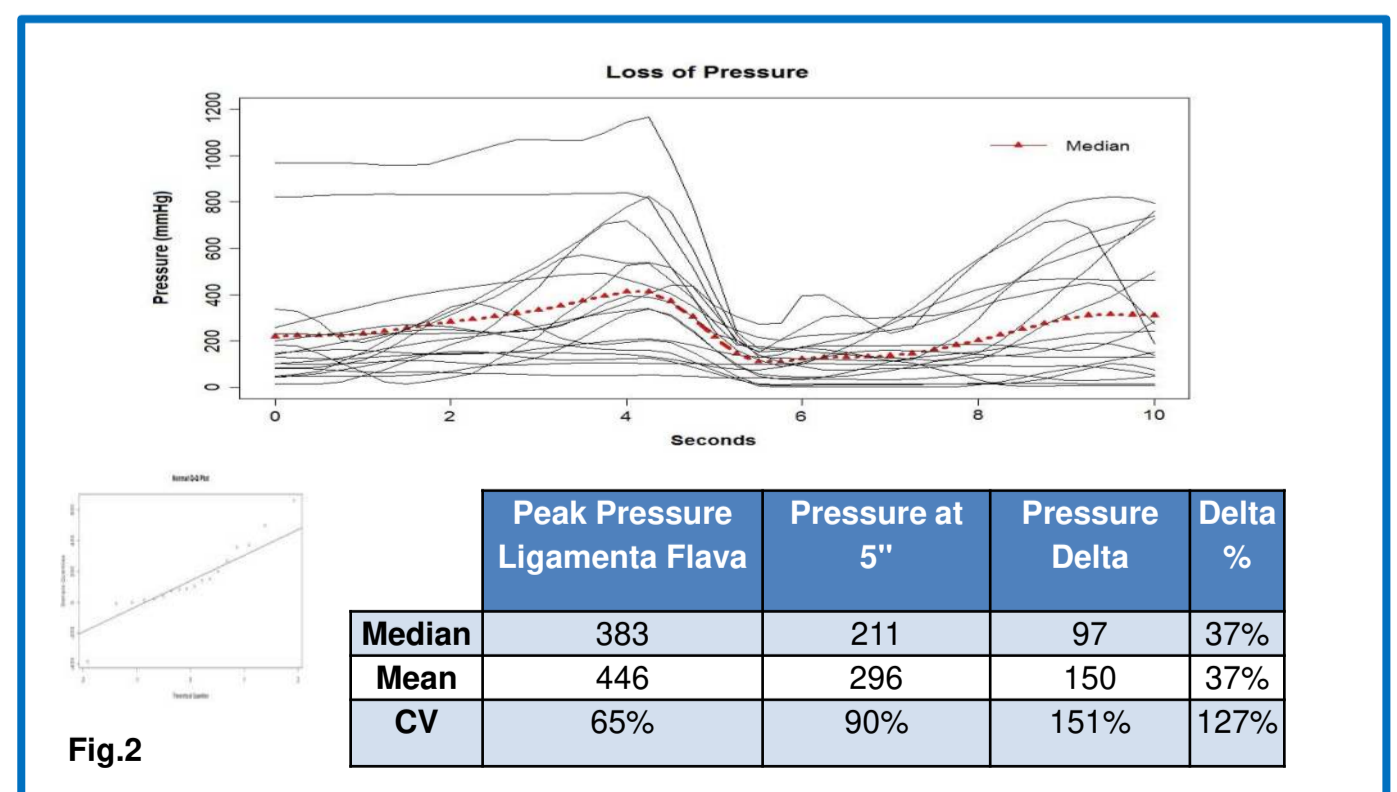
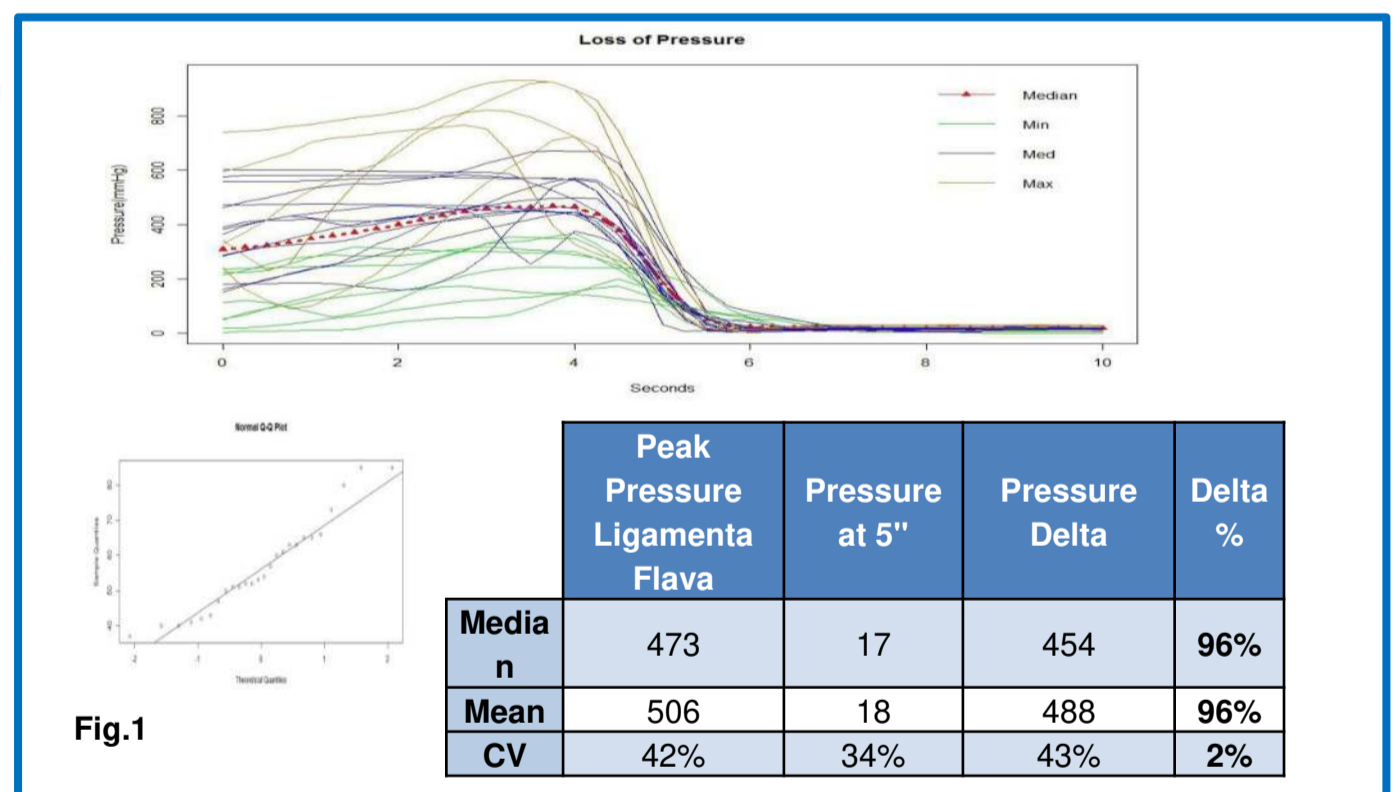
Epidural anesthesia (EA) was performed in the lateral position using a 16G Tuohy needle at the L3-L4 or L4-L5 interspace. A 3-way stopcock was connected to the end of the epidural needle with the in-line port of the stopcock attached to a 10 ml saline-filled LOR syringe. A 120 cm arterial pressure tubing connected the side port to another 20 mL normal saline syringe, loaded into the injection pump. The stopcock was opened to allow the performance of epidural block in the conventional fashion. The CompuFlo device was set to deliver normal saline at a rate of 0.050 ml/s with a maximum pressure limited to 200 mmHg. When the epidural space was reached, the pressure drop reading was recorded for 5 seconds. For the purpose of the study we switched off the acoustic signal and made it impossible for the operator to see the device's screen.

The agreement between the two raters (the operator's reported sensation during needle advancement in the ligamentum flavum and into the epidural space and the variation of pressure recorded by CF) were analyzed by Spearman's rho test. A sample of 27 patients were needed to obtain a significance level of 5% and a power of 95%.



## Results and discussion:

In all cases EA was performed successfully. There was a good agreement between the operator and the CF device concerning the identification of the ligamentum flavum and the epidural space (Spearman's rho index = 0,79). In Fig.1 the peak pressures of the ligamenta flava are reported. Pressures observed in the ligamentum flavum were significantly higher than those in the epidural space with a drop greater than 96% (SD 0.2) in all cases. In Fig.2 the graph of pressures registered when the operator encountered contact with bone during advancement of the Tuohy needle is reported. Both the epidural space and the bony contact identification were associated with a significant drop of pressure. However the delta of pressure recorded in the epidural space was significantly greater than that recorded during the bony contact (t-test; P 0.05).



## Conclusion

This study indicates that there is a good agreement between the operator and the pressures noted by the CF device which can be effectively used for the identification of the epidural space in the obstetric population.