

# International Multicenter Study of Accidental Dural Puncture Rate; Comparison of the CompuFlo with Traditional Method



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## Introduction

Accidental dural puncture (ADP) is a complication of epidural anesthesia with reported rates of 0.5-4% (1).

The use of continuous real-time pressure sensing technology (CompuFlo) has been recently validated as a tool to identify the epidural space and is gaining popularity as an alternative to traditional loss of resistance (LOR) technique (2).

*The aim of this study was to determine ADP rate and its complications comparing the use of continuous real-time pressure sensing technology and traditional LOR technique in parturients under labor epidural analgesia.*



## Methods

We collected records of epidural administration on labor and delivery patients using the CompuFlo technology from four institutions between 2015 and 2019: 1 from the USA, 1 from Chile and 2 from Italy. The data from the USA site is a randomized controlled noninferiority trial comparing the traditional and CompuFlo method in identifying the epidural space (2). For each site, we examined the parturient characteristics, including age, BMI, parity, and delivery method (**Table**). We also investigated the composition of epidural performers (anesthesiologist, fellow, resident, or nurse anesthesiologist) on each site. The study outcome was any complication after the epidural placement, including ADP, postdural puncture headache (PDPH), and epidural blood patch.

## Results

Among the four sites, there were 812 parturients who received epidural analgesia with CompuFlo and none of them had accidental dural puncture regardless of the composition of the epidural performer types (**Table**). However, ADP rate in the traditional LOR group from the non-inferiority trial was 5% where the performer composition was more heterogeneous (site 1) (2). Among 812 parturient in the CompuFlo group, no PDPH or other complications were observed. One parturient among 78 in the traditional LOR group from the non-inferiority trial suffered from PDPH.

Patient Characteristic	Site 1		Site 2	Site 3	Site 4
	CompuFlo (N= 70)	Traditional (N= 78)	CompuFlo (N= 488)	CompuFlo (N= 155)	CompuFlo (N=99)
	Mean ± STD				
Age	32.0 ± 5.3	30.9 ± 5.4	35.0 ± 7.2	26.2 ± 4.5	31.1 ± 5.4
BMI	30.0 ± 5.1	30.7 ± 5.7	28.8 ± 4.2	27.3 ± 3.4	29.0 ± 3.8
	N (%)				
Epidural performer type					
Anesthesiologist	11 (15.7)	8 (10.3)	488 (100)	155 (100)	86 (86.9)
Fellow	47 (67.1)	49 (62.8)			13 (13.1)
Resident	12 (17.1)	19 (24.4)			
Nurse anesthesiologist	0 (0)	2 (2.6)			
Delivery method					
C section	N/A	N/A	427 (87.5)	46 (29.7)	24 (24.2)
Vaginal			61 (12.5)	109 (70.3)	75 (75.8)
Parity					
Nullipara	N/A	N/A	N/A	105 (67.7)	78 (78.8)
Multipara				50 (32.3)	21 (21.2)
Accidental dural puncture	0 (0)	4 (5.1)	0 (0)	0 (0)	0 (0)
PDPH	0 (0)	1 (1.3)	0 (0)	0 (0)	0 (0)
Epidural blood patch	0 (0)	N/A	0 (0)	0 (0)	0 (0)

## Conclusion

This is the first international multicenter study in the literature to compare the incidence of ADP of CompuFlo with continuous LOR technique. Epidural analgesia with CompuFlo was found to be safe and none of parturients in this group had ADP regardless of the composition of the epidural performer types. Further studies should aim to determine the cost-effectiveness of this continuous real-time pressure sensing technology.

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