

Labor Epidural Failure Rate with CompuFlo Device Assistance for Placement

Trent Weatherley, MS; Allison Mullins, MD; Mai-Anh Vu, MD; Keyin Michelle Lu, MD; Rakesh Vadhera, MD, FRCA, FFARCSI; Rovnat Babazade, MD

The University of Texas Medical Branch at Galveston, Department of
Anesthesiology, Galveston, TX



INTRODUCTION

Epidurals have been used for many years to provide labor analgesia to parturients in the United States. Unfortunately, failure of epidural anesthesia and analgesia occasionally occurs and is more common in obese patients [1]. The traditional method of epidural placement relies on subjective tactile sensation alone. The CompuFlo Epidural System (CES) provides objective pressure measurements from the distal tip of the Tuohy needle as it traverses various tissue planes during epidural placement that can guide needle advancement decision making. Epidural failure rate using the traditional method for placement has been estimated to be around 9-12%, increasing to 15% in patients with BMI > 35 kg/m² [2, 3]. We aim to determine the epidural failure rate when using the CompuFlo epidural system for labor epidural placement.

PURPOSE

The purpose of this retrospective review was to evaluate the epidural failure rate when placing an epidural with the assistance of CompuFlo. We hypothesized that use com the CompuFlo epidural system would reduce epidural failure rate by providing objective data during placement.

METHODS

After obtaining IRB exemption (IRB # 21-0320), we performed a retrospective data analysis of 51 patients who underwent epidural placement with the assistance of CES at a single institution. Epidural failure was defined as the need for epidural replacement or one sided epidural.

Table 1	
Patient Characteristics	
	Mean (SD)
Age (years)	22.4 (±5.4)
BMI (kg/m^2)	33.7 (±7.4)
Height (m)	1.59 (±0.01)
Weight (kg)	88.7 (±25.4)
Race	
African American	5
Asian	1
Caucasian	43
Parity	
Nullipara	20
Multipara	31
Epidural Performer Type	
Faculty	6
Fellow	8
PGY-4	16
PGY-3	12
PGY-2	8
Delivery Mode	
Vaginal	40
Cesarean	11

Table 2	
Complications	Perecentage
Need for Replacement (all patients)	5.88 (3/51)
Need for Replacement (BMI >35)	0 (0/19)
One Sided Epidural	0 (0/51)
GA for Cesarean Section	27.3 (3/11)



RESULTS

The failure rate was 5.88% (3/51) Average BMI 33.7 (SD 7.4), see Table 1 for demographic data. Data describing the pressure in the ligamentum flavum and epidural space was available for one patient who required epidural replacement and showed an average ligamentum flavum pressure of 140 mmHg and epidural pressure of 35 mmHg with a pressure waveform rating of 3 on a scale of 1-5. This data was not available for the other 2 patients with failed epidurals. The epidural failure rate for patients with BMI > 35 kg/m² was 0%.

DISCUSSION

Although the number of patients in this study is small, we demonstrate a decreased epidural failure rate compared to previously published rates when using CES as an objective measure to guide labor epidural placement. This improvement is most apparent in the obese patient population who traditionally are at increased risk of epidural failure and more challenging epidural placement. CES has been shown to aid with the identification of false loss of resistance possibly contributing to the decreased epidural failure rate, particularly in obese patients who are more prone to have false loss of resistance during placement.

REFERENCES

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