

Color Flow Doppler in Spinal Ultrasound: A Novel Technique for Assessment of Epidural Catheter Position

Oscar F.C. van den Bosch MD, Yehoshua Gleicher MD MSc, Cristian Arzola MD MSc, Naveed Siddiqui MD MSc, Kristi Downey MSc, Jose.C.A. Carvalho MD PhD

Department of Anaesthesiology and Pain Medicine, Mount Sinai Hospital, University of Toronto

Introduction

Ultrasound is increasingly used to facilitate placement of an epidural catheter for the management of labor pain.

Color flow Doppler allows **visualization of flow** using Doppler shift.

Recent studies have proposed color flow Doppler to visualize **flow in the epidural space**, however with limited success.^{1,2}

Primary objective:

To use color flow Doppler ultrasound to visualize flow distal to the epidural catheter tip in patients undergoing epidural analgesia for childbirth.

Methods

Research Ethics Board approval with written informed consent.

Study design: Prospective observational cohort study.

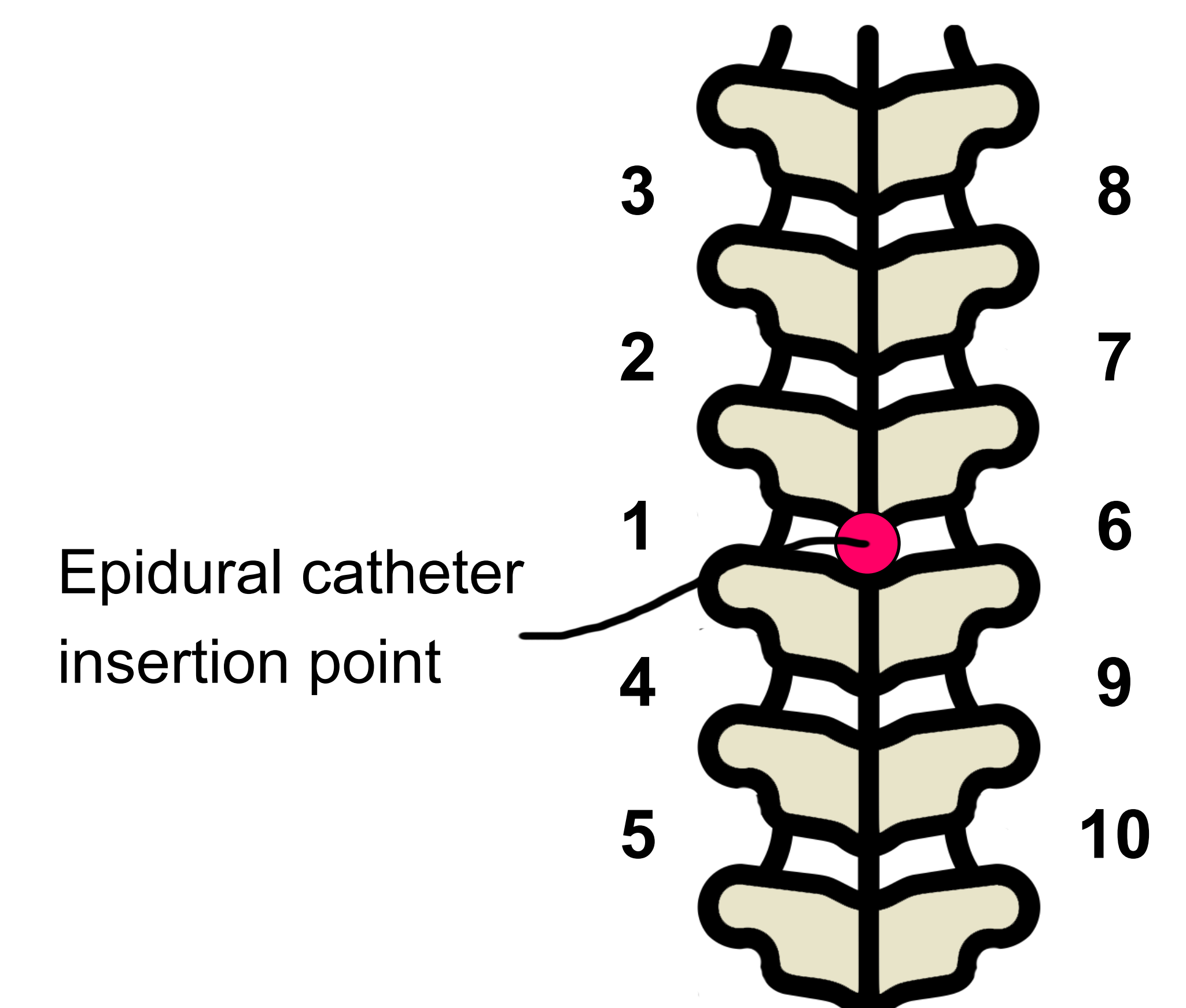
Population: Patients who delivered vaginally under epidural analgesia.

Ultrasound procedure:

5-2 MHz curvilinear probe, longitudinal paramedian oblique view:



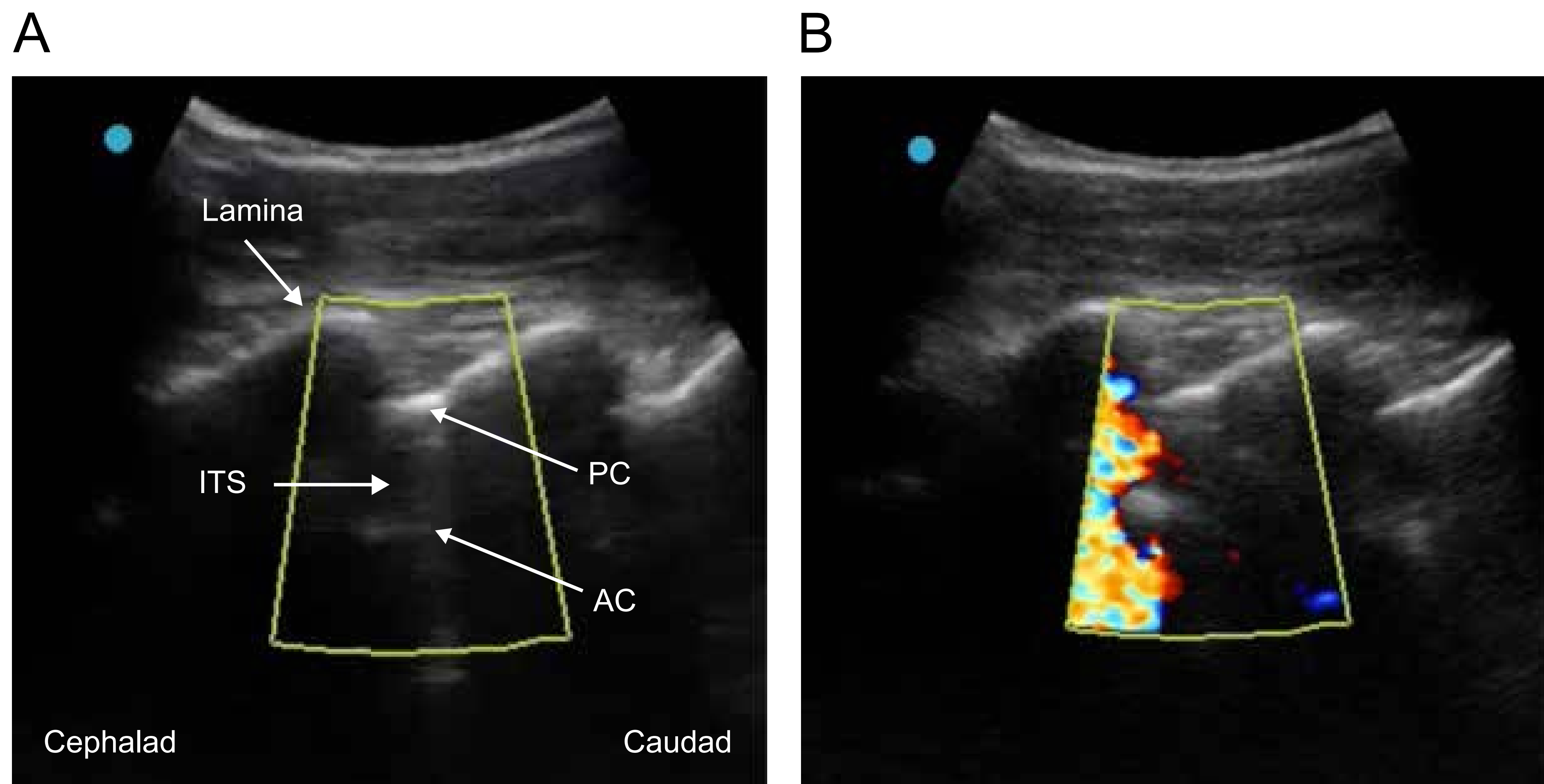
10 assessments



Color flow Doppler upon **injection of 1 ml of NS at each of 10 assessments**.

Assessment considered **positive** if **turbulent flow** was detected on the anterior and/or posterior complex.

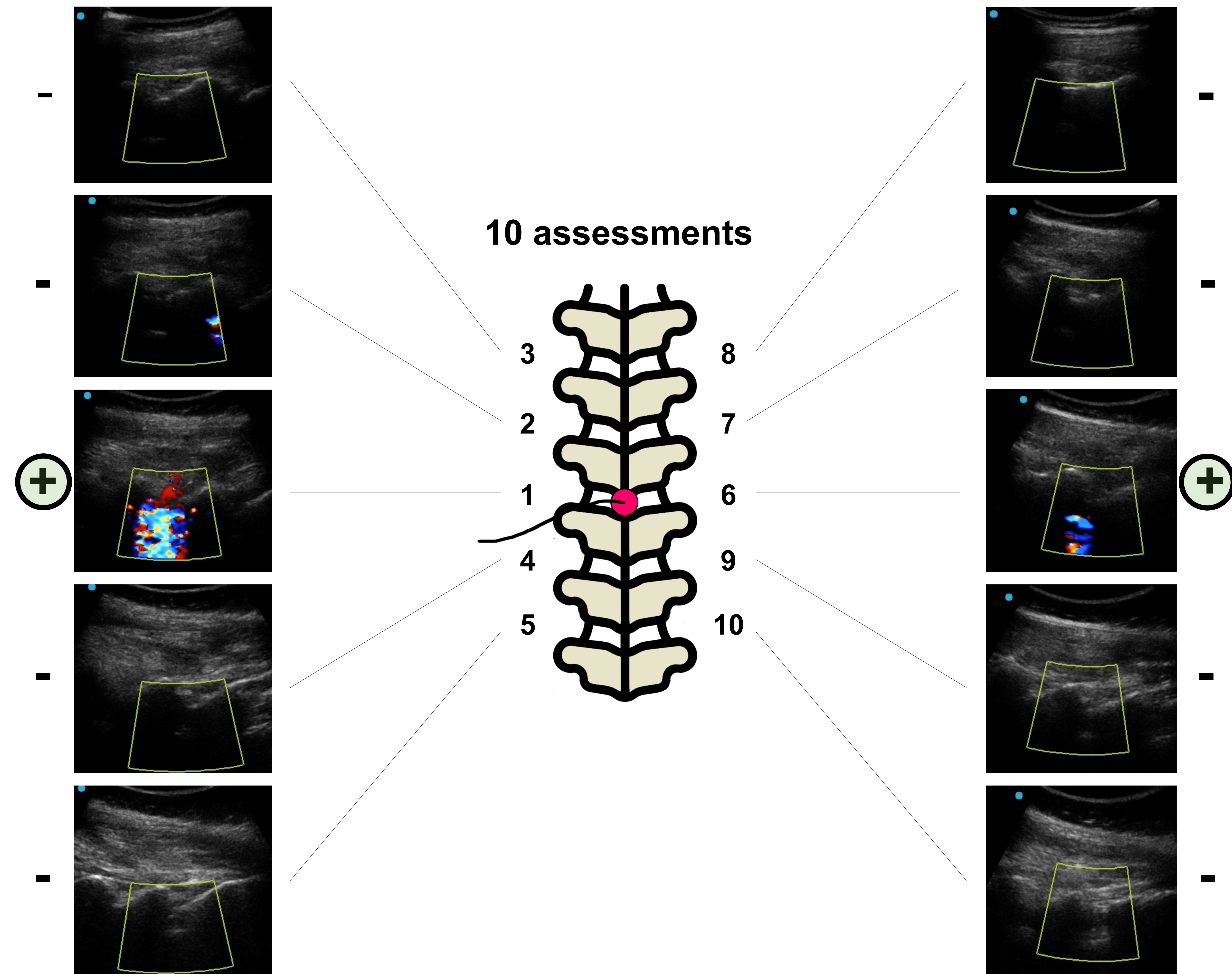
Results



A: Paramedian longitudinal oblique view of L2-L3 interspace.

B: Visualization of flow in the epidural space upon injection of 1 ml of normal saline using Color Doppler Mode.

AC: anterior complex; PC: posterior complex; ITS: intrathecal space.



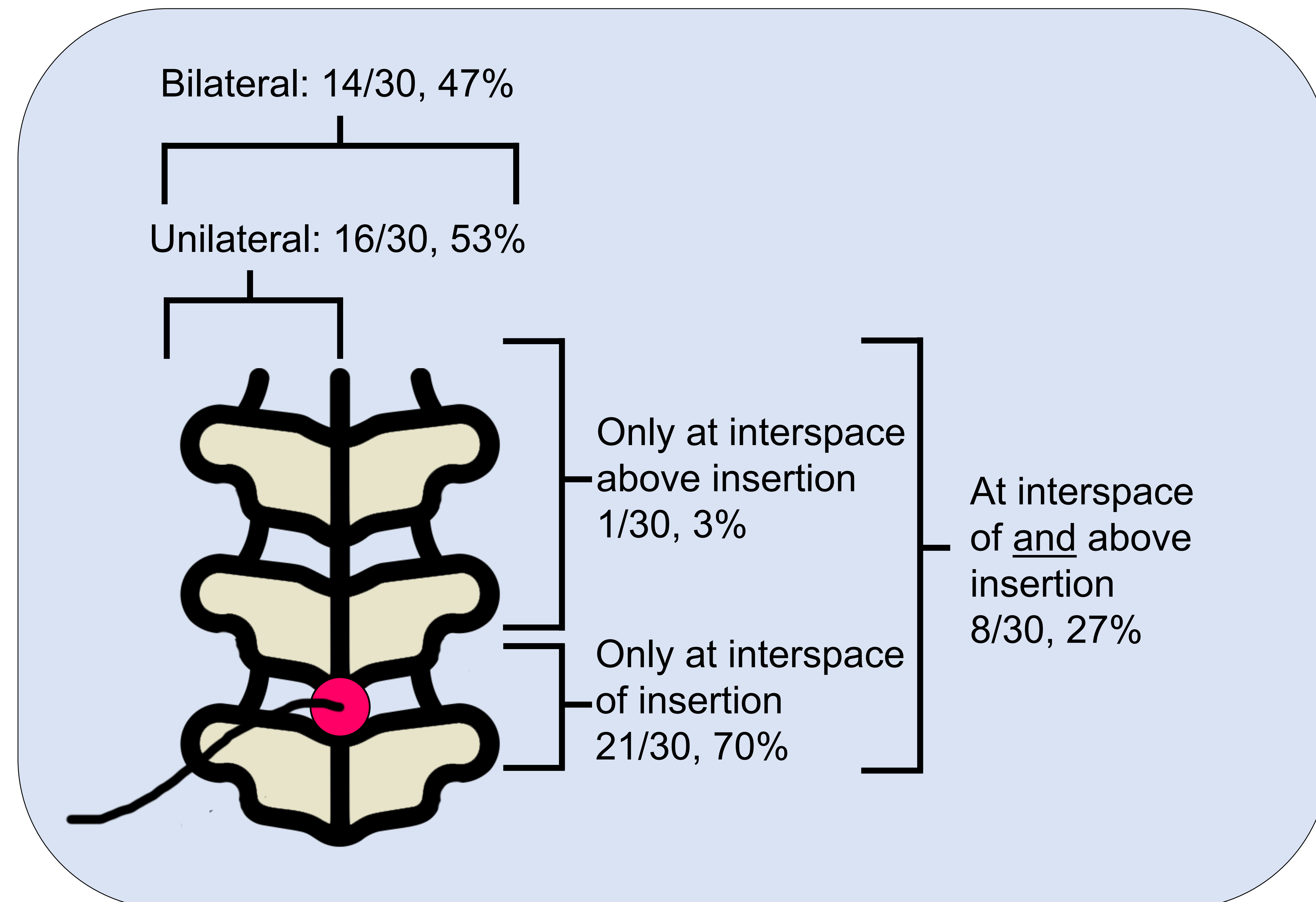
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Interim results, 33/40 patients.

All participants had **successful analgesia** with **bilateral blocks**.

Flow visualized in 30/33 patients (91%).



Discussion

Color flow Doppler ultrasound is a **feasible and fast tool** to visualize flow distal to the epidural catheter in the obstetric population.

This technique has the potential to **confirm the position of epidural catheter** after placement.

Our preliminary results suggest that epidural catheters mostly **remain at the interspace of insertion**.

Further studies warranted to determine :

- Clinical significance of unilateral flow on color flow Doppler
- Feasibility of color flow Doppler at insertion of epidural catheter
- Can this ultrasound application decrease epidural failure rate?

References

1. Elsharkawy H, et al. *Can J Anesth* 2017; 64:489–496.
2. Riveros-Perez E, et al. *Minerva Anesthesiol* 2019; 85:376–383.