ULTRASOUND GUIDED CAUDAL EPIDURAL BLOCK: THE DOPPLER EFFECT CAN CONFIRM THE SPREAD OF THE MEDICATION IN THE LUMBAR EPIDURAL SPACE. CASE REPORT SERIES.

Antonio Ojeda, MD; Xavier Sala-Blanch MD; Luis A. Moreno MD; Adela Faulí, MD, PhD; Carme Busquets, MD
Pain Unit. Department of Anesthesiology. Hospital Clínic de Barcelona. Barcelona, Spain.

Introduction

Caudal Epidural Steroid Injections

✓ Indicated in chronic low back pain refractory to conservative treatment, and commonly used for spinal lumbar stenosis pain when surgery is contraindicated
✓Advantages: Less incidence of dural puncture, ease in patients with scar tissues (previous surgery)
✓Blind technique failure rate could reach 40 %

Ultrasound (US) Guided Caudal Epidural Block

✓ Described by Chen in 2004.
✓ Report of similar results for pain relief in the short term as the fluoroscopic approach in unilateral lower lumbar radicular pain
✓ US and the doppler effect (DE) have been used in children to objectify the arrival of liquid into the epidural lumbar space (ELS), **which has not been studied in adults**

Ultrasound Advantage

✓ Less cost
✓ Portability
✓ No risk of radiation
✓ Useful as a diagnostic and screening tool
✓ Visualization of soft tissue, nerves and blood

Ultrasound Disadvantage

✓ Depends on the practitioner´s expertise
✓ Obese patients
✓ Suboptimal visualization of deep small structures
✓ Bony artifacts limits the resolution at deep levels

Disadvantage of US Guided Epidural Block

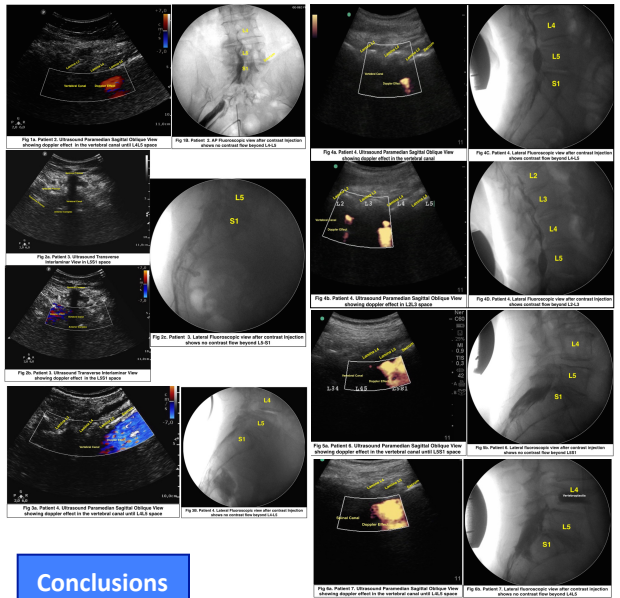
Not able to see the spread of the medication into the ELS

Methods

Objectives: To assess if the DE has the ability to confirm the spread of the medication in the ELS through the caudal approach

Prospective case report series of patient with SLS pain in which a caudal epidural block was indicated

✓Us Guided Epidural Caudal Block using the method describe by Chen et al, and fluoroscopy confirmation
✓*Subsequently* another US probe in the lower lumbar region to observe the longitudinal paramedian oblique plane (LPOP)
✓DE to display the flow of liquid in the interlaminar spaces at different levels depending on the SLS
✓If this plane failed, the probe was placed in the interlaminar transverse plane (ILTP)
✓Similarly, the fluoroscopy and radiopaque contrast was used to ratify the spread of medication



Results

Patient	Hiatus Sacrum Visualization	Difficulty of needle insertion	Tip of needle confirmation by doppler effect	Vascular Spread by fluoroscopy	Difficulty of Visualization of the spinal canal	Doppler effect visualization into the spinal canal	Stenosis Level by Fluoroscopy	Highest level of doppler effect in the spinal canal
1	yes	no	ok	no	no	yes	L5-S1	L5-S1
2	yes	no	ok	no	no	yes	L5-S1	L5-S1
3	yes	no	ok	no	no	Only in Short Axis	L3-L4	L5-S1
4	yes	no	ok	no	no	yes	L4-L5	L4-L5
5	yes	yes	ok	no	no	yes	L2-L3	L2-L3
6	yes	no	ok	no	no	yes	L5-S1	L5-S1
7	yes	yes	ok	no	no	yes	L4-L5	L4-L5
8	yes	no	ok	no	no	yes	L4-L5	L4-L5
9	yes	no	ok	no	no	yes	L4-L5	L4-L5

✓ US guided epidural caudal injection was possible in all the patients evaluated.
✓ 8 patients → Arrival of contrast evident in the LPOP
✓ 1 patient → Arrival of contrast evident in the ILTP
✓No DE was evident at higher levels to SLS

Conclusions

Using DE confirmed the arrival of liquid into the vertebral canal; the absence of this at higher levels correlates with the level of the SLS.
More studies are warranted to confirm this finding.

Bibliography

- Chen CP et al . Anesthesiology 2004 Jul; 101(1)181-4
- Price CM, et al. Ann Rheum Dis 2000; 59:879-82
- Kim Yh et al. Pain Res Manag 2014;19, 275-279
- Chen CP, et al. Arch Phys Med Rehabil. 2010 Mar;91(3):358-63
- Aggarwal A, et al. Surg Radiol Anat 2009;31:93-800.
- Yoon JS et al. Pain. 2005 Nov;118(1-2):210-4.
- Tsui B,et al. Anesth Analg 2013;116:1376–9
- Park Y et alAm J Phys Med Rehabil. 2013 Jul; 92(7):575-86