

SUBDURAL CONTRAST SPREAD IN THE CONTRALATERAL OBLIQUE VIEW DURING EPIDURAL STEROID INJECTION

Luisa A Bastian, MD¹, Nathan D Clements, MD¹, Zack Brooke, MS², Anmarie Jaghab, DO¹, and Christopher Yopp, MD¹

For accessing the cervical epidural space, the contralateral oblique (CLO) view under fluoroscopy at 50 degrees (CLO50) has been described as a safe and effective view for obtaining epidural access, with some studies suggesting it is superior to the lateral and anteroposterior (AP) views for correct needle tip placement (1). Because false loss of resistance can still occur using this approach, contrast medium needs to be injected prior to medication administration to ensure correct placement. It is important to recognize spread patterns within the

meningeal layers to distinguish between proper placement into the epidural space and unintended spread into the subdural or intrathecal space.

Currently there are limited images in the literature of the appearance of subdural injections of contrast medium and none are in the contralateral oblique view. The goal of this study is to assist readers in recognizing subdural injections and ultimately avoid its potential harmful complications and lack of therapeutic benefit.

For these images, the spread of contrast medium can

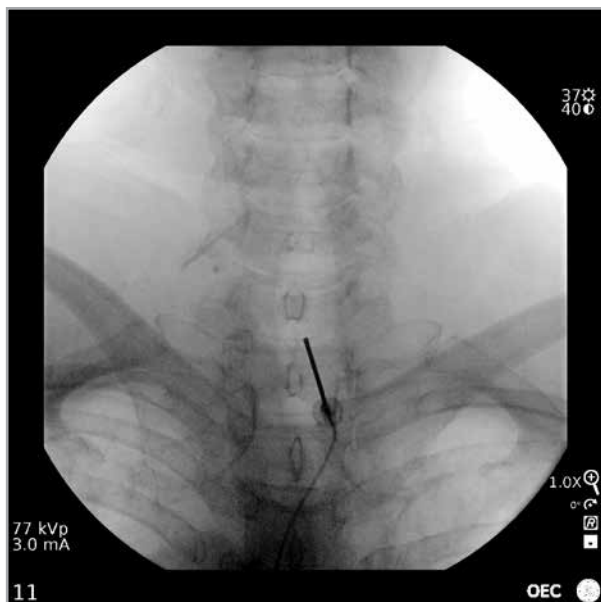


Fig. 1. AP view showing subdural spread with symmetric “tram track” contrast pattern.

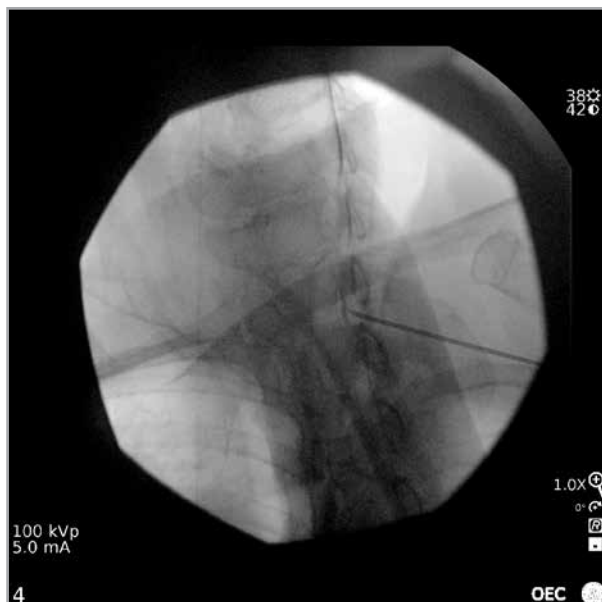


Fig. 2. CLO50 view showing subdural spread.

From: ¹Department of Physical Medicine and Rehabilitation, University of Texas Health Science Center at San Antonio, San Antonio, Texas; ²Department of Anesthesiology, University of Texas Health Science Center at San Antonio, San Antonio, Texas

Corresponding Author: Luisa A. Bastian, MD, E-mail: bastianl@uthscsa.edu

Disclaimer: There was no external funding in the preparation of this manuscript.

Conflict of interest: Each author certifies that he or she, or a member of his or her immediate family, has no commercial association (i.e., consultancies, stock ownership, equity interest, patent/licensing arrangements, etc.) that might pose a conflict of interest in connection with the submitted manuscript.

Patient consent for publication: Consent obtained directly from patient(s).

Accepted: 2023-03-28, Published: 2023-07-31

be divided into 3 separate sections described by Gill et al (2). These 3 sections separate the area between the ventral interlaminar line (VILL) and the ventral foraminal line into equal thirds, known as the oblique zones (OZ) 1-3 running from posterior to anterior.

In these images, very subtle loss of resistance was appreciated as the needle was advanced in the CLO50 as the needle approached OZ-2. After negative aspiration,

0.25 mL of contrast medium was injected and it was noted that there was asymmetric spread with no direct contact of the VILL in the CLO50 view and asymmetric tram track appearance concerning for subdural spread in the AP view, with contrast medium also spreading up to C1-2. This patient also described a painful sensation at the base of the skull even with small volume contrast medium injection.

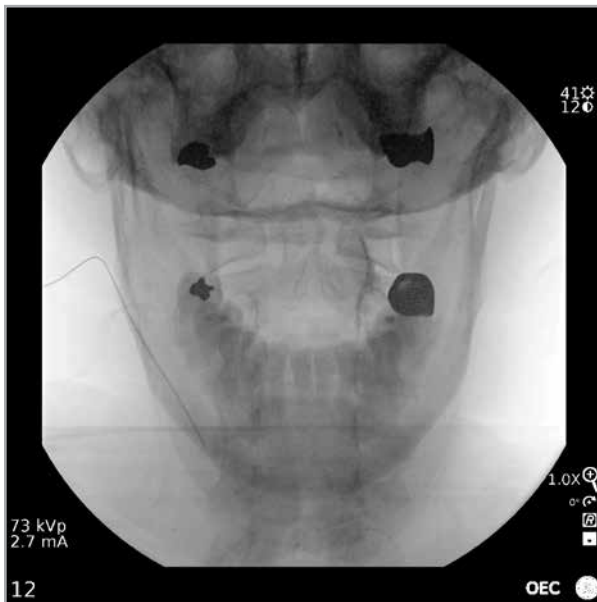


Fig. 3. Odontoid view showing subdural spread proximal to the C1/2 joint.



Fig. 4. Oblique view showing subdural contrast spread.

REFERENCES

1. Gill JS, Aner M, Nagda JV, Jyotsna N, Keel JC, Simopoulos TT. Contralateral oblique view is superior to lateral view for interlaminar cervical and cervicothoracic epidural access. *Pain Med* 2015; 16:68-80.
2. Gill J, Nagda J, Aner M, Simopoulos T. Cervical epidural contrast spread patterns in fluoroscopic antero-posterior, lateral, and contralateral oblique view: A three-dimensional analysis. *Pain Med* 2017; 18:1027-1039.
3. Nagpal AS, Probert S, Bhinder A, Boies B. Intrathecal contrast spread pattern in contralateral oblique view during a cervical interlaminar epidural steroid injection. *Pain Med* 2022; 23:590-591. doi:10.1093/pm/pnab302.
4. Boies B, Bhinder A, Probert S, Nagpal AS. Intrathecal contrast spread pattern in the lumbar spine in contralateral oblique view. *Pain Med* 2021; 23:1027-1028. doi.org/10.1093/pm/pnab323.