



Contrast Spread Technique: Evolution.

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Dear Editor,

As an attendee at the ISIS Hands-On Bio-Skills Lab, I received the following advice: Be as obsessive-compulsive with your procedures as possible. Follow the same order and use the same technique every time. I have followed this rule for years. However, the introduction of Contrast Spread Technique (CST) [1] changed the way I perform epidural injections and lead me to paradoxical findings. I would like to share them with your readers.

The recognition of needle entry into an epidural space is a pivotal moment in cervical, thoracic or lumbar epidural injections. Its significance cannot be overestimated. Regardless of how experienced you are, realizing that you are approaching an epidural space makes your heart beat faster. The safety of the procedure and its success rate depends upon proper and reliable identification of the needle entering into the epidural space. Recent advances in our understanding of fluoroscopic needle depth visualization empower Pain Practitioners with the knowledge of how to safely place the needle close to the ventral interlaminar line (VILL). [2, 3, 4, 5] However, recognition of the needle exiting the ligamentum falvum and entering into the epidural space was until now performed with the art of Loss of Resistance Technique (LORT). To rely upon LORT, a practitioner has to master his tactile sensation of change in resistance to the level of an expert. Contrast Spread Technique (CST), on the contrary, depends upon the knowledge and the ability to utilize fluoroscopy to recognize needle depth. We use various fluoroscopic views, and our understanding of clinical anatomy, to create a three-dimensional visualization of the needle tip inside the human body, and to answer the following questions: How close is the needle tip to the epidural space and how far it is from the midline?

Figure 1

Utilization of CST brought me to two paradoxical findings:

There may be no need for the LOR syringe, and there may be no need for an epidural needle.

My first finding is understandable as CST does not utilize tactile loss of resistance, but employs visual CST instead. My second finding occurred after I performed many successful procedures over the course of several months, at the cervical and the thoracic spine. Tuophy, Hustead, Sprotte and other epidural needles have shorter, more angulated, and less sharp bevels in order to minimize the chance of inadvertent puncture of the dura matter and to facilitate LORT. I found that the 22g Quincke needle works better with CST than the 20g Tuophy epidural needle. The bent tip Quincke needle is much easier to maneuver and navigate towards the desired spot under fluoroscopy than a thicker, straight epidural needle. This is important at the cervical spine where spaces are small and accuracy of needle placement is critical. The bent tip Quincke needle makes a challenging procedure possible when attempting to place the needle between angulated spinal processes at the thoracic spine. I found that my success rate with thoracic epidurals became higher after I substituted the Tuophy with the Quincke needle. With CST, one may see the spread of the contrast into an epidural space, as well as into soft tissue when only the very edge of the needle's bevel is inside the epidural space and the rest is in soft tissue. This would

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3 follow with classic contrast spread into an epidural space with minimal needle advancement. In this
4 author's opinion, the short-beveled sharp cutting needle would be advantageous to the Quincke needle
5 for the purpose of CST.
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8 "All truth passes through three stages. First, it is ridiculed. Second, it is violently opposed. Third, it is
9 accepted as being self-evident. "[6] It is not a goal of this article to change common practices in epidural
10 injections. LORT is safe and reliable in experienced hands and one cannot consider himself a Pain
11 Practitioner until he masters it. There is no substitute for LORT with Spinal Cord Stimulator trials or
12 when epidural injection has to be done blindly, as, for example, in labor epidurals. However, it is this
13 author's belief that CST could be an alternative to LORT in challenging cervical and thoracic procedures.
14 With advances in fluoroscopy and in our understanding of imaging of the spine, it may become a helpful
15 tool for Pain Practitioners to recognize epidural space while performing spinal injections.
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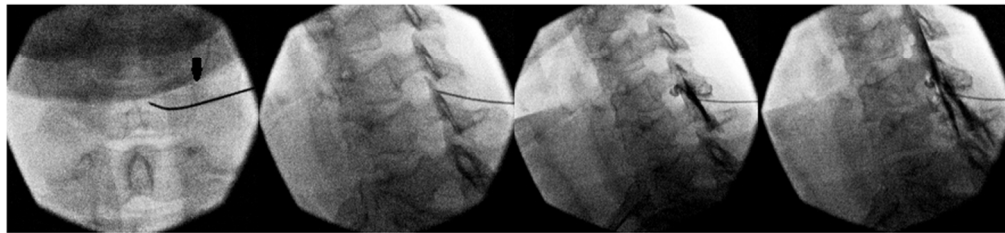


Figure 1 Sequential fluoroscopic images of CST: First, the needle was placed using right paramedial approach under anterior-posterior view at C5-C6 level; second, it was advanced under contralateral oblique view close to VILL; third, injection of contrast showing soft tissue spread, lateral to VILL; fourth, injection of contrast showing epidural spread, medial to VILL. All pictures are done with pulsed fluoroscopy. Arrow indicates the bent tip Quincke needle.

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