Journal of Pain Research

Dovepress
open access to scientific and medical research

Open Access Full Text Article

RESPONSE TO LETTER

Creating Realistic Definitions of Clinically Significant Radiographic Lead Migration – A Response to "Migration of Epidural Leads During Spinal Cord Stimulator Trials" [Response to Letter]

Robert H Jenkinson[1], Andrew Wendahl[1], Yue Zhang[2], Jill E Sindt[1]

[1]Department of Anesthesiology, University of Utah, Salt Lake City, UT, USA; [2]Department of Biostatistics, University of Utah, Salt Lake City, UT, USA

Correspondence: Robert H Jenkinson, Department of Anesthesiology, University of Utah, 30 N 1900 E RM 3C444, Salt Lake City, UT, 84112, USA, Tel +1 801-581-6393, Fax +1 801-581-4367, Email Robert.Jenkinson@hsc.utah.edu

Dear editor

We thank Dr. Mullins for this Letter to the Editor in response to our article and for encouraging more dialogue surrounding the clinical significance of radiographic lead migration.[1]

We agree that defining what constitutes clinically significant lead migration during a trial of spinal cord stimulation (SCS) is important, particularly in the era of paresthesia-free and paresthesia-independent waveforms. Our initial decision to designate 50% of a vertebral body level as significant lead migration was selected prior to any imaging interpretation for the study and prior to any data analysis. This threshold was chosen largely based on clinical experience, with the common nomenclature of designating lead tip position at the top/middle/bottom of a particular vertebral body. Additionally, it was influenced by the magnitude of reported migration in prior studies (as little as 3 mm to 9 mm based on standard fixation techniques).[2,3]

Dr. Mullins' proposed definition of clinically significant radiographic lead migration utilizing the intended area of stimulation and half of the standard percutaneous SCS lead length does offer a logical and convenient clinical measurement (corresponding well with approximately the standard thoracic spine vertebral body height). However, we feel this proposed definition is too wide-ranging as some programming paradigms rely on specific contacts on one or both leads and not the entirety of both leads. Of note, if applied to our cohort, 71.4% of patients had at least one lead migrate at least 1 full vertebral level, and 34% had both leads move at least one full vertebral body level.

We are still left with what in our view is the most challenging issue: how to apply this information as it relates to surgical placement. How should we interpret this intra-trial lead migration during implantation? If lead placement is carefully undertaken and recorded during a trial, and yet it is acknowledged that lead migration of ½ vertebral body levels occurs in nearly all patients, with a number of patients experiencing ever greater migration, should standard practice continue to include implanting the surgical leads in the same position as the initial trial placement? A recent publication reported a mean caudal migration distance within 20 days of implantation of 12.34 mm over 91 cases.[4] If trial leads are meant to mimic permanent placement, how do we combine the degree of intra-trial migration and the now published degree of post-implant lead migration?

This all highlights the need for a well-designed prospective study on these issues, including serial x rays during SCS trials to assess when a significant migration has occurred, as well as a better consensus on nomenclature and clinical threshold for concern surrounding the topic of radiographic SCS lead migration.

Disclosure

The authors report no conflicts of interest in this communication.

Received: 17 January 2023
Accepted: 8 February 2023
Published: 16 February 2023

References

1. Jenkinson RH, Wendahl A, Zhang Y, Sindt JE. Migration of epidural leads during spinal cord stimulator trials. *J Pain Res*. 2022;15:2999–3005. doi:10.2147/JPR.S378937
2. Osborne MD, Ghazi SM, Palmer SC, Boone KM, Sletten CD, Nottmeier EW. Spinal cord stimulator–trial lead migration study. *Pain Med*. 2011;12:204–208. doi:10.1111/j.1526-4637.2010.01019.x
3. Kim CH, Green AW, Rodgers DE, Issa MA, Ata MA. Importance of axial migration of spinal cord stimulation trial leads with position. *Pain Physician*. 2013;16:E763–E768. doi:10.36076/ppj.2013/16/E763
4. Dombovy-Johnson ML, D'Souza RS, Ha CT, Hagedorn JM. Incidence and risk factors for spinal cord stimulator lead migration with or without loss of efficacy: a retrospective review of 91 consecutive thoracic lead implants. *Neuromodulation*. 2022;25:731–737. doi:10.1111/ner.13487

https://doi.org/10.2147/JPR.S405133