Author's response to reviews

Title: Subdural spread of injected local anesthetic in a selective transforaminal cervical nerve root block: a case report

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Author's response to reviews: see over
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Professor Michael Kidd AM
Editor-in-Chief, Journal of Medical Case Reports
Flinders University
Australia

Ref: MS: 1645243129627782
Subdural spread of injected local anesthetic in a selective transforaminal cervical nerve root block

Dear Dr. Kidd:

Thank you very much for your letter, along with the comments from referee 1 and referee 2 on our manuscript entitled, “Subdural spread of injected local anesthetic in a selective transforaminal cervical nerve root block: a case report.” We found the comments from the two referees to be reasonable, and we were very pleased by the remark, “We would be grateful if you could address the comments in a revised manuscript.” We have carefully read all of the comments and revised the manuscript accordingly. We have also had the English in the revised manuscript re-edited by a native English speaker and scientist.

I submit here the revised manuscript to be considered for publication in the Journal of Medical Case Reports. I hope and believe that this revised manuscript meets all of your requirements for publication. Thank you very much.

Sincerely yours,

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Replies to reviewers

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*Journal of Medical Case Reports*

To Reviewer #1:

Thank you for reviewing our manuscript. We found your comments helpful and have revised our manuscript in response. Our point-by-point responses to your comments (1) to (7) appear below.

Revisions necessary for publication:

Abstract:
(1) - Please review the conclusion. From the description of the case presentation in the abstract, it appears to me that one may conclude that efforts at minimizing subdural puncture would be the main goal, and a secondary conclusion that this case highlights the importance of having access to advanced cardiopulmonary life support during this type of procedure.

Case Presentation:
(2) - Sentences 1-3. Sentence 1 is a nice opener. It is unclear to me however, why cervical injection was chosen for a patient with no relevant PMH or imaging findings- a little more history would be helpful in understanding the authors’ thought process in proceeding with an injection that had a severe adverse event.

The MRI findings are relevant however for explanation of the adverse event and should be included as present.
(3) - Sentence 9-end of paragraph: Please elaborate on the exact injection technique
used. Much of the case discussion talks of different injection technique used with tubing extension, negative aspiration, real time fluoroscopic guidance, and when the needle is touched and therefore potentially manipulated as this is a very relevant part of this type of procedure. Was the contrast medium viewed under real time fluoroscopy, or was this a spot film after injection? Was microbore tubing used with this injection? At what points was the needle touched to switch out various instruments? It would be helpful for the reader to understand if the dural puncture occurred despite epidural contrast flow pattern; if subdural flow pattern was obscured by epidural flow pattern due to lack of real time guidance; or if inadvertent needle repositioning occurred after successful injection of contrast with or without the use of extension tubing. Without this information, the authors’ conclusion of the case report is unclear, especially with regards to advocating that lidocaine test dose be used, if other safety measures that were mentioned in the discussion were not used.

(4) - Please submit an AP fluoroscopy view as well if present; Figure 1 is difficult to interpret, perhaps due to transition to a computer image. The flow pattern is not readily recognizable.

Discussion:

(5) - Please frame the beginning of the discussion with the current case presentation as a segue into the discussion. The discussion appears to be a review of the present literature regarding cervical transforaminal epidural injection, and highlighting that this case represents a previously unpublished adverse event would be helpful.

(6) - In addition, much of the discussion focuses on literature reviewing cervical transforaminal epidural injection adverse vascular events either by dissection, intravascular anesthetic injection, or vascular particulate steroid embolus. Please remark on available literature regarding outcomes of subdural injection of anesthetic and of anesthetic + steroid. In a brief Medline search for “subdural anesthesia,” an article by Lubenow T et al, “Inadvertent Subdural Injection: A Complication of an Epidural Block,” from 1988 amongst others were readily available for review. Please consider including this and perhaps other related articles in the discussion, as this appears relevant to the case report.

- The last paragraph’s relevance would be enhanced by a more detailed description of the procedure as recommended in the case presentation section above.

Conclusion:
As noted above, one may consider revising the conclusion to include ways to minimize the occurrence of the adverse event (i.e., recognition of dural puncture) as well as the importance of advanced cardiopulmonary support in the event of high spinal anesthesia.

Responses to reviewer comments:
(1) and (7) We reviewed the conclusion and revised it in accordance with your suggestion.

(2) We added more information regarding patient history and imaging findings to our revised manuscript in accordance with your suggestion.

(3) We elaborated on our procedure of transforaminal selective cervical nerve root block in our revised manuscript in accordance with your suggestion. Although the spread of the contrast medium along the C6 nerve root was observed, the subdural flow of the contrast medium was not viewed very well with real-time fluoroscopy. The microbore extension tubing (pigtail) was not used throughout the procedure. After the extension tube that was used for radiculography was removed from the spinal needle, we connected the normal extension tube with a syringe filled with lidocaine to the spinal needle. At this point or thereafter, we thought that the movement of the needle tip centrally, which would result in the puncture of the epidural sac of the nerve root sleeve, might occur.

(4) We regret to say that we do not have an AP fluoroscopy view. Because Figure 1 was not very clear as you pointed out, we did not include the Figure 1 from the original manuscript in our revised manuscript.

(5) We moved the paragraph regarding the present case, which was the last paragraph of the original manuscript, to the first paragraph of our revised manuscript in accordance with your suggestion.

(6) We cited the study entitled, “Inadvertent subdural injection: a complication of an
epidural block” by Lubenow et al. in our revised manuscript in accordance with your suggestion.

To Reviewer #2:
Thank you for reviewing our manuscript. We found your comments helpful and have revised our manuscript in response. Our point-by-point responses to your comments (1) to (2) appear below.

- Revisions necessary for publication
(1) Figure one is confusing. A plain AP-view is more easy to understand.
(2) I do not understand why a preinjection of local anaesthetic should confirm the needle position? That is why contrast media is used. Clarify this.

Responses to reviewer comments:
(1) Because Figure 1 was not very clear as you pointed out, we did not include the Figure 1 from the original manuscript in our revised manuscript. Although we agree that an AP image is more significant, we regret to say that we do not have an AP image.

(2) During the procedure, the spinal needle position is confirmed with an injection of contrast medium. However, if some of the contrast medium enters a small vessel, we are not able to see the intravascular contrast medium very well because of blood flow. Therefore, in order to minimize the risk of permanent spinal cord injury, some authors have recommended a preliminary injection of local anesthetic before injecting corticosteroids as the anesthetic allows the operator to assess whether the local anesthetic has entered a blood vessel or not.