

Review report

Final title: Percutaneous epidural balloon decompression and neuroplasty by ZiNeu catheter in lumbar spinal stenosis patient in Bangladesh: A case report

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Reviewer: Taslim Uddin, ORCID: [0000-0002-2884-9212](https://orcid.org/0000-0002-2884-9212)

Overview

Thank you for submitting the manuscript. This case report presents a novel application of percutaneous epidural balloon decompression and neuroplasty (PEBN) using the ZiNeu catheter for a patient with lumbar spinal stenosis. While the report is well-structured and follows the CARE guidelines, several areas require improvement, including appropriate introduction, clarity in the case description, appropriateness of the procedure and outcomes before finally it is accepted for publication.

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Keywords

percutaneous epidural
neuroplasty, balloon
decompression, lumbar spinal
stenosis, ZiNeu catheter

Funding

None

Ethical approval

Ethical approval was not sought because this is a case report. However, written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Trail registration number

Not applicable

Declaration

None

1 Comment The patient has mechanical and inflammatory components of pain resulting from radiculopathy, disc prolapse, and spinal canal stenosis AND SpA. However, the report lacks a comprehensive personal history, including occupation, diurnal variation of pain, and morning stiffness, and detailed physical examination notes including lumbosacral mobility (Schober Test). The patient's prior treatment history and response to previous interventions should be more clearly elaborated. Other medical records including laboratory tests eg. HLAB27, Treatment history eg. DMARDs, Physical Therapy sessions, etc required in line: 66-71.

Response We appreciate your inquiry. Due to the Journal's word limit, it is not feasible to include an exhaustive personal history, detailed physical examination, and additional medical background. Consequently, we have presented only the most pertinent findings. The patient was referred to the rheumatology department, following which treatment with tofacitinib and physical therapy was initiated.

2 Comment Does The patient had symptoms for 3 years (line 66). The current treatment regime continued for one month only with minimal improvements: it's not clear whether the patient had adequate management including rehabilitation modalities to declare- the case is a resistant one and eligible for balloon decompression (Line 79).

Response Thank you for your inquiry. Regarding the symptoms experienced over the past three years, the patient had intermittently used NSAIDs and engaged in physical therapy for a duration of two months, one year prior. Consequently, we did not classify the case as resistant. We presented the options of Epidural Steroid Injection and percutaneous electrical nerve stimulation to the patient. Additionally, we thoroughly explained the advantages and disadvantages of both procedures, as the patient expressed a preference for PEBN.

3 Comment Explanation of why this technique was chosen over other available treatments like Physiotherapy modalities, surgical decompression, or conventional epidural steroid injections.

Response The patient had previously undergone conservative therapy and physiotherapy, which did not yield the anticipated outcomes. Percutaneous adhesiolysis was selected due to its level 1 to level 2 evidence and moderate to strong recommendations for 1-year follow-up (Manchikati, 2023). In contrast, Epidural Steroid therapy demonstrated level 2 to 3 evidence for short-term and long-term efficacy, respectively (Manchikati, 2015). We offered both Epidural Steroid and PEBN, providing a comprehensive explanation of the advantages and disadvantages of each procedure. The patient opted for PEBN.

• Manchikanti, L., Kaye, A.D., Manchikanti, K., Boswell, M., Pampati, V. and Hirsch, J. (2015) 'Efficacy of epidural injections in the treatment of lumbar central spinal stenosis: a systematic review', *Anesthesiology and pain medicine*, 5(1), p. e23139. Available at: <https://doi.org/10.5812/aapm.23139>.

• Manchikanti, L., Knezevic, N.N., Knezevic, E., Pasupuleti, R., Kaye, A.D., Sanapati, M.R. and Hirsch, J.A. (2023) 'Efficacy of Percutaneous Adhesiolysis in Managing Low Back and Lower Extremity Pain: A Systematic Review and Meta-analysis of Randomized Controlled Trials', *Pain and therapy*, 12(4), pp. 903–937. Available at: <https://doi.org/10.1007/s40122-023-00508-y>.

- 4 **Comment** Diagnosis SpA needs further discussion, as this could have implications for treatment choice and outcomes.
- Response** Thank you for the inquiry. Although the patient endured pain for three years, we initially suspected spondyloarthritis (SpA) and subsequently referred the patient to the Rheumatology department. While we intended to provide a more comprehensive discussion on SpA, constraints on word count necessitated a focus on the advanced technique, resulting in a reduction of content in other sections
- 5 **Comment** Expand on the case background and prior treatment history, Provide more details on procedural limitations and challenges and Strengthening the discussion by comparing it with existing literature is required.
- Response** We appreciate your recommendations. While we aimed to expand on certain aspects, the Journal's strict word count constraints prevented us from sufficiently condensing the procedural details to allow for a more comprehensive discussion of the limitations and challenges.
- 6 **Comment** Case note: Please justify the use of the Kemp test in this case (used as a provocative test for facet joint).
- Response** The Kemp test, traditionally employed as a provocative assessment for facet joint disorders, also serves as a valuable diagnostic tool for foraminal stenosis (Singh , 2024).
- Singh, J.R., Chen, H., Arzani, A., Goldberg, J.L., Navarro-Ramirez, R., Hussain, I. and Härtl, R. (2024) 'Validation of a novel provocative examination maneuver for the diagnosis of lumbar foraminal stenosis through selective nerve root block outcomes', Journal of minimally invasive spine surgery and technique, 10(Suppl 1), pp. S6–S13. Available at: <https://doi.org/10.21182/jmisst.2024.01389>.
- 7 **Comment** It would be appreciated if the authors could plot the parameters eg. NRS Pain score, Physical examination note- , Schober's test, SLR, FABER, and Laboratory tests- ESR, CRP in table for ease of comparison of improvements over the time.
- Response** Illustrating all parameters will result in an increased volume of text. We have emphasized all the parameters identified.
- 8 **Comment** Figure 1, the photograph needs to be high quality for better clarity of the catheter and spinal anatomy.
- Response** We acknowledge your concern. However, due to a technical glitch, we are limited to the photographs included in the case report, and we do not possess higher-quality images than those provided.
- 9 **Comment** It's not clear how the authors ascertained that this was the first case in Bangladesh.
- Response** We conducted a search using the Google and Yahoo search engines to identify any published case reports or articles pertaining to PEBN in Bangladesh. Our search did not yield any articles or case reports on this topic within the context of Bangladesh.
- 10 **Comment** references: Some citations lack page numbers, For example, Reference Number 9, Shin JW. Spinal Epidural Balloon Decompression and Adhesiolysis. 1st ed. Springer; 179 2021. doi:10.1007/978-981-15-7265-4 doi:10.1007/978-981-15-7265-4.
- Response** We corrected this citation.

Reviewer: Seong-Soo Choi, ORCID: [0000-0002-2333-0235](https://orcid.org/0000-0002-2333-0235)

Overview

First of all, I am glad that balloon neuroplasty is being performed successfully in Bangladesh. I have some questions and recommendations for addition to this case report.

- 11 **Comment** It would be better to present the patient's lumbar MRI together.
- Response** Not included here due to format constraints.
- 12 **Comment** As the authors described in the introduction, more invasive and expensive PEA and PEBN are considered when there is insufficient response to conservative treatment including ESI for at least 3 months. In other words, chronic lumbar radiating pain is indicated (Ref 3). However, in this case, it is stated that conservative treatment was performed for only about one month. Why is that? Also, was ESI performed before PEBN? If not, what was the reason?
- Response** Clarified that the patient had intermittent NSAIDs and physical therapy for 2 months prior. PEBN was chosen due to persistent symptoms.
- 13 **Comment** Was the patient sedated during the procedure?
- Response** The patient received local anaesthesia (1% lidocaine) without sedation.
- 14 **Comment** What exactly is ASA monitoring? Line:80.

Response "ASA monitoring" refers to the guidelines established by the American Society of Anesthesiologists (ASA) for critical anaesthesia monitoring. These guidelines mandate the continuous evaluation of oxygenation, ventilation, circulation, and temperature during the entire anaesthetic process.

15 **Comment** NRS was 2 at the one-month follow-up after the procedure. What was the pain intensity before the procedure expressed as NRS? Likewise, other variables should be presented before the procedure.

Response Added baseline NRS (8/11) for comparison.

16 **Comment** Since the procedure for this case was performed in November 2024, I recommend to add the follow-up 3 or 4 months later if possible.

17 **Comment** Figure 1, if possible, it is recommended to present the original image stored in the C-arm rather than the image taken of the monitor with a camera.

Response Original C-arm images are unavailable; current images are the best available.

Reviewer: Kazi Mahzabin Arin, ORCID: 0009-0004-2364-3847

Overview

I believe that, if all these points are appropriately addressed, this will be an excellent case report. However, it is important to consider that for a lower-middle-income country like Bangladesh, this may not be a cost-effective intervention.

Thank you, and best wishes.

18 **Comment** You mentioned the abbreviation PEBN. Please provide the full form in line 3, followed by the abbreviation in brackets. You can then use the abbreviation throughout the manuscript (Line: 6).

Response Added full form at first mention.

19 **Comment** Please specify the unit of measurement for the CRP level (Line: 70).

Response Corrected & Specified as "8 mg/L."

20 **Comment** After failing to respond to oral medications, did you consider using conventional epidural steroids? If not, please explain why you chose the ZiNeu catheter in the first place. As noted in reference 6, the American Society of Interventional Pain Physicians (ASIPP) recommends percutaneous adhesiolysis for lumbar stenosis after conservative management failures and fluoroscopically guided epidural injections (Lines: 77-79).

Response Epidural steroid injection was not performed due to the patient's preference for PEBN after discussing options.

21 **Comment** Please provide the full form of ASA (Line: 80).

Response We provided full form of ASA in the text. ASA stands for the American Society of Anesthesiologists, a professional organisation committed to advancing anesthesiology. Established in 1905, the ASA prioritises patient safety, promotes educational initiatives, supports research endeavours, and advocates for maintaining high standards in anaesthetic care. The organisation publishes prominent journals, including *Anesthesiology*, and formulates practice guidelines to improve perioperative care. Additionally, the ASA significantly influences healthcare policies concerning anaesthesia, pain management, and critical care.

22 **Comment** Did you perform local infiltration of the skin before introducing the 10G needle? It appears to be extremely painful, so please include this information in the manuscript (Line: 81).

Response Added detail: "Skin was infiltrated with 1% lidocaine before needle insertion."

23 **Comment** Line 95: In addition to the patient's satisfaction level, please compare the improvement in the patient's pain and other symptoms following the intervention with the presenting symptoms described in lines 66-68.

Response Thanks for your concern. This point is addressed in the follow-up section.

24 **Comment** Please specify the follow-up interval. Was it daily or weekly? (Line: 96).

Response We have mentioned follow-up after one month.

25 **Comment** You mentioned the pain scores after the procedure. What were the baseline scores? Please include these in the presenting features for comparison (Line: 97).

Response In the follow-up section, we added the baseline NRS (8/11) for comparison.

26 **Comment** You noted improvement in symptoms on the right side, as indicated by a negative straight leg raise and Kemp tests. What were the findings for the left side? (Line: 99).

Response As the patient complained of symptoms on right leg and which improved after the intervention. We did not mention it due to as there was no symptom on the left side.

27 **Comment** Line 117: A reference is needed for this statement.

Response We apologise for not being able to point out the specific statement you want to address.

28 **Comment** In your conclusion, you stated that the combined balloon decompression and adhesiolysis approach using the ZiNeu catheter is a promising alternative for managing chronic lumbar spinal stenosis. You need to discuss other interventions that have been performed and clarify the advantages of your approach (Line 123).

Response Due to our word count constraints, we were unable to discuss other treatment modalities in detail. Our focus is solely on PEBN.

29 **Comment** The funding information is repeated in line 148.

Response It may be a mechanical error.

30 **Comment** Were there any complications during or after the procedure? If there were none, please mention this in the case description.

Response No complications were observed.

31 **Comment** the section on presenting features, you noted bilateral sacroiliac tenderness and positive Patrick's and sacral thrust tests. How did you address these issues? (Lines 68-69).

Response As mentioned in the case report in lines 62-63, we referred the patient to the rheumatology department. They diagnosed the patient with spondyloarthropathy and started oral tofacitinib and physical exercise. However, the patient showed a minimum response in the follow-up after one month.

Editor: M Mostafa Zaman, ORCID: [0000-0002-1736-1342](https://orcid.org/0000-0002-1736-1342)

32 **Comment** The learning points should be replaced by "Key Message". This is due to a change in the Journal's style. The key message should be written in descriptive terms within 60 words.

Response We appreciate your feedback. The "Key Message" has been updated to align with the Journal's guidelines.