

## Peer Review File

**Article information:** <https://dx.doi.org/10.21037/jss-21-89>

Comment 1: The introduction should start with the prevalence of spinal pathology and also address that besides of currently only objective assessments of patients' function as treatment outcome, to date the optimal time for treatment is often not known.

Reply 1: Yes, good points. We have added information about the prevalence of spinal pathology in lines 38-39. We have mentioned the uncertainty surrounding the optimal timing of treatment in lines 54-56.

Comment 2: Greater detail on the Oura Ring is necessary to allow the reader to place the device in to the current advancements in wearable sensor technology. Specifically, information should be provided on, among others, sensor specifications, sampling rate, wear location, battery capacity and charging, downloading data, data processing, validation, reliability etc.

Reply 2: Thank you, we have added this information in lines 110-118.

Comment 3: Lines 93-96: References for these statements are missing. For instance, some studies have assessed walking in patients with symptomatic lumbar spinal stenosis (<https://pubmed.ncbi.nlm.nih.gov/?term=walking+symptomatic+lumbar+spinal+stenosis>).

Reply 3: Yes, we have added the missing reference for the statement in lines 154-156. We have also added additional citations from the search that you recommended in line 160.

Comment 4: Line 107: "and" is missing after Kose et al. (2019).

Reply 4: Thank you, we have corrected this.

Comment 5: "which show" to "who showed".

Reply 5: Thank you, we have corrected this.

Comment 6: Line 110-113: Very nice line of argument. In fact, HRV and HR could be validated during hospital stay with inpatient monitoring system.

Reply 6: Yes, this is an exciting concept. We have also added your idea regarding the validation of this concept in lines 180-181.

Comment 7: Line 124: “Together, our case report, and the findings of recent literature, suggest that objective outcome measures can be used alongside PROMs to facilitate a more holistic assessment of spine patients.” Other studies have suggested that objective gait parameters assess a different dimension of functional limitations than that assessed using PROMs (ODI) in patients with symptomatic lumbar spinal stenosis. Please add this aspect (e.g., Severity of degenerative lumbar spinal stenosis affects pelvic rigidity during walking. Bumann H, Nüesch C, Loske S, Byrnes SK, Kovacs B, Janssen R, Schären S, Mündermann A, Netzer C. *Spine J.* 2020 Jan;20(1):112-120. doi: 10.1016/j.spinee.2019.08.016. Epub 2019 Aug 31. PMID: 31479778; Decompression surgery improves gait quality in patients with symptomatic lumbar spinal stenosis. Loske S, Nüesch C, Byrnes KS, Fiebig O, Schären S, Mündermann A, Netzer C. *Spine J.* 2018 Dec;18(12):2195-2204. doi: 10.1016/j.spinee.2018.04.016. Epub 2018 Apr 27. PMID: 29709554).

Reply 7: We have added this aspect in lines 204-205 and have also cited the studies you mentioned. We phrased this aspect in terms of objective outcome measures more generally instead of objective gait metrics as the present case report is not only focussed on gait and walking metrics but also on general health metrics.

Comment 8: Having information on the ODI for at least some time points would have been valuable. Why was this not assessed?

Reply 8: Reporting the ODI for some timepoints could have been useful but we are unable to recover this data. Instead, we now acknowledge this as a limitation of our study and call for future similar studies to do so in lines 188-190.