OPEN PEER REVIEW REPORT 1

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COMMENTS TO AUTHORS

The paper is very well written, thoughts are expressed clearly and in an organized manner. The topic discussed by the authors would certainly be of much interest to both researchers and clinicians in the SCI field. I do not have revisions regarding the information displayed in the paper, as I think many important aspects have been well discussed. I do have a few considerations of things to include or mention in the paper however.

My first major comment is that the authors primarily focus on the role of CST plasticity in the context of locomotion and hindlimb recovery after SCI. The main issue I see with this is that the CST is not as heavily involved in hindlimb activity as it is in forelimb function. Hindlimb and locomotion are mainly mediated by spinal circuitry that generation "rhythmic-like" ambulatory action. And as I said, this is a collective function of spinal circuitry in the lumbar cord. In fact, studies have shown that hindlimb activity is moderated by reticulospinal tract, and the midbrain (not so much primary motor corext/CST). Conversely, the CST is more involved in forelimb activity, as it produces voluntary FINE control, is required for arm activity. Therefore, you should include a discussion on the role of CST sprouting after injury to forelimb and arm function. You may employ studies that use a pyramidal tract lesion as models, since not too many studies that examine the cst specifically perform spinal injuries.

My next suggestion is that you should include a brief discussion on the fact that majority of studies used to investigate the CST are not clinically relevant (ptx, dorsromedial injury, dorsolateral injury, etc). Although they are designed to impair the CST specifically, it is difficult to assert that their observations would actually occur in a real life situation where more than one pathway is severed. So a discussion on the limitations of the studies as a whole is required.