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LETTER TO THE EDITOR

"1.5 Dissociation" of somatoparaphrenia for the upper limb and neglect for the lower limb following a thalamic stroke presenting as flaccid hemiparesis: rehabilitation applications and neuroscience implications

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In a recent paper Perren et al. (2015) describe what they call a case of "crossed" somatophrenia. That is, a right-handed patient with a stroke in the left brain who felt that her left arm was not her own. (The attribution of "crossed" comes by analogy to aphasia: As Perren et al. emphasize in more than 90% of known cases of patients with somatoparaphrenia (Vallar and Ronchi 2009) have strokes in the right brain and say that a limb on the left side is not their own. This overwhelming difference in laterality is not dissimilar to aphasia where 90%+ of aphasiac patients have lesions in the left brain, "crossed" aphasiac patients being those (in particular right-handed individuals) who have aphasia following a lesion to the right brain.) But here we want to emphasize another detail of the case that Perren et al. mention only in passing: the patient had somatoparaphrenia for his leg, but not for his arm and the patient also had extrapersonal neglect, and mild intrapersonal neglect. This is the first case we have seen where a patient has somatoparaphrenia for one limb and—presumably—neglect but not somatoparaphrenia for another limb. (The cases of Invernizzi et al. (2013) might be others, but it is not commented on whether or not patients had somatoparaphrenia for the leg as they did for the arm.) We want to report another quite dramatic case of this "1.5 dissociation" of somatoparaphrenia and neglect where recognition of the dissociation was helpful in the patient's rehabilitation and also discuss implications this dissociation could have for understanding the etiology of somatoparaphrenia.

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A 75 year old female presented to an acute hospital with left side weakness. On exam she was alert and oriented to person and place with normal speech and intact sensation in all limbs. Strength on the right was 5/5, but tone was flaccid on the left with 0/5 strength in the left upper extremity (LUE) and 3−/5 in the left knee and hip and 1/5 left ankle. CT showed a 1.7-cm subacute hematoma within the right thalamus. On admission to acute rehab 2 weeks later she had intact sensation and flaccid tone with strength 0/5 LUE above elbow, 1/5 below, 2-/5 hand grip, 0/5 left hip, 1/5 rest of LLE except 0/5 dorsiflexion (DF). She required maximum assistance of two for transfers. MRI confirmed prior CT. We also found the patient to have left hemispatial extrapersonal and personal neglect and pusher syndrome to the left.

With encouragement and direction/attention to the left side she showed 3 + strength (except 0 DF) in the LLE, and after 4 weeks was able to transfer with only moderate assistance and walk 10′ in parallel bars with maximum assistance. At follow-up after discharge her family noted the increased mobility was most beneficial. Conversely, she showed dense somatoparaphrenia in the left arm which was resistant to therapy, saying, e.g., "I don't have [that arm]." While on occasion the patient exhibited ~ 2+/5 strength, the arm remained functional.

Neglect is thought to be an attentional disorder (Halligan et al. 1989), thus therapy may be beneficial, as in our case, since patients can be susceptible to suggestions to move and use the affected limb. Somatophrenia presents as a disorder of cognition or belief (Ramachandran 2011)—even if these are false or delusional—and thus is frustratingly resistant to suggestion, redirection or cajoling in a rehabilitation setting. A recent paper has cases demonstrating a dissociation of somatoparaphrenia from anosognosia for hemiplegia (Invernizzi et al. 2013). The case of Perren et al. and ours here demonstrate the dissociation of somatoparaphrenia

from neglect. Understanding of somatoparaphrenia and its cause(s) remains incomplete (Vallar and Ronchi 2009; Invernizzi et al. 2013; Perren et al. 2015), but the case here may help in understanding the etiology of this perplexing neurologic condition. Appreciation of the discordant appearance of somatoparaphrenia vs. neglect in the upper/lower limbs was beneficial in the rehabilitation and may be for other patients as well.

Compliance with ethical standards

Conflict of interest We have no financial or other conflicts.

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