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Occurrence of phantom genitalia after gender reassignment surgery

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Summary Transsexuals are individuals who identify as a member of the gender opposite to that which they are born. Many transsexuals report that they have always had a feeling of a mismatch between their inner gender-based ''body image'' and that of their body's actual physical form. Often transsexuals undergo gender reassignment surgery to convert their bodies to the sex they feel they should have been born. The vivid sensation of still having a limb although it has been amputated, a phantom limb, was first described by Weir Mitchell over a century ago. The same phenomenon is also occurs after amputation of the penis or a breast. Around 60% of men who have had to have their penis amputated for cancer will experience a phantom penis. It has recently been shown that a significant factor in these phantom sensations is ''cross-activation'' between the de-afferented cortex and surrounding areas. Despite this it also known that much of our body image is innately ''hard-wired'' into our brains; congenitally limbless patients can still experience phantom sensations. We hypothesise that, perhaps due to a dissociation during embryological development, the brains of transsexuals are ''hard-wired'' in manner, which is opposite to that of their biological sex. We go on to predict that male-to-female transsexuals will be much less likely to experience a phantom penis than a ''normal'' man who has had his penis amputated for another reason. The same will be true of female-to-male transsexuals who have had breast removal surgery. We also predict that some female-to-male transsexuals will have a phantom penis even although there is not one physically there. We believe that this is an easily testable hypothesis, which, if correct, would offer insights into both the basis of transsexuality and provide farther evidence that we have a gender specific body image, with a strong innate component that is ''hard-wired'' into our brains. This would furnish us with a better understanding the mechanism by which nature and nurture interact to link the brain-based internal body image with external sexual morphology. We would emphasise here that transsexuality should not be regarded as ''abnormal'' but instead as part of the spectrum of human behaviour.

Background

Transsexuality

Transsexuality, otherwise known as gender dysphoria, is a condition in which the individual self-identifies as a member of the gender opposite to that

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which they are born [1,2]. Many transsexuals report that they have always had a feeling of a mismatch between their inner gender-based ''body image'' and that of their body's actual physical form. ''I feel like a woman trapped in a man's body and this penis doesn't feel like it is part of me'', is a common refrain amongst male-to-female transsexuals.

Often transsexuals undergo medical and surgical treatment to convert their bodies to the sex they feel they should have been born [1—4]. In the case of male-to-female transsexuals this gender reassignment surgery consists of removal of much of the penile tissue, in order to construct an artificial vagina [1]. Female-to-male transsexuals frequently have chest reconstruction surgery — a modified bilateral mastectomy [3] — and some also go on to have a phalloplasty, which is a multi-stage fashioning of a penis from the surrounding tissues [4].

Phantom sensations

The graphic feeling of a limb still being present despite its amputation — a phantom limb — was first described by Weir Mitchell [5] in the nineteenth century. However, it has only been in recent years that there has been a renewal of interest in phantom limbs as a means for investigating the plasticity of the brain and the extent to which aspects of body image are innately specified. After removal of a hand, the region of the somatosensory cortex that is de-afferented is ''taken over'' by afferents that normally innervate the adjacent face portion of the map [6—9]. Consequently, touching the face causes referred sensations in the phantom hand.

Although phantoms are often paralysed, some can be visually ''resurrected'' by use of a parasagital mirror positioned vertically in front of the patient so that the reflection of the normal (say left) hand appears optically superimposed on the phantom [6,7,9—11]. If the patient moves his left hand it creates the illusion that the right phantom arm is moving and, surprisingly, the patient also feels that it is moving. Often repeated use of this procedure can cause the patient's phantom arm to vanish [6,7,9,11]; indicating the remarkable malleability of body image.

Notwithstanding this malleability there is undoubtedly also a hard-wired, innately specified scaffold for body image; patients with congenital absence of both arms may also experience vivid phantoms [6,12,13]. We believe that phantom sensations offer an unique window into how nature and nurture interact to create one's body image.

Phantom sensations do not just occur after amputation of a limb. (Ref) Extensive data [14—16] are available regarding the phenomenon of phantom penises after amputation for malignancy; eg. Crone-Munzebrock [14] found 7 out of 12 patients (58%) experienced phantom penises. The same is true of breasts in women; with phantom breast sensations described by between 33% and 53% of women who have undergone mastectomy for carcinoma [17—20]. These reports indicate that men have an internal image of their penis as part of their body image, and women of their breasts.

The hypothesis

We hypothesise that, perhaps due to a dissociation during embryological development, the brains of transsexuals are ''hard-wired'' in manner, which is opposite to that of their external morphological sex. In other words, they are not merely being metaphorical when they claim there is a mismatch between their internal gender-identity and their external somatic gender.

This hypothesis allows us to make several clearly testable predictions. We predict that male-to-female transsexuals, who have undergone gender reassignment surgery, will experience a far lower incidence of having a phantom penis than men who have had their penis amputated for other reasons. Similarly, female-to-male transsexuals who have had chest reconstruction surgery will not experience phantom breast sensations as frequently as women who undergo mastectomy for cancer.

Conversely, we think that this hypothesis also predicts that some female-to-male transsexuals will have the vivid sensation of having a penis — a phantom penis — even although there is not one physically there. This would be entirely analogous to the individuals mentioned above, who are born without arms, but nonetheless have phantom limbs.

Provisional data

We are currently investigating the above hypothesis by surveying and interviewing transsexuals. Provisional data from several dozen post-operative subjects lends support to our prediction that they have a lower incidence of phantom penis/breast sensations than ''normal'' individuals who have undergone amputation of the same appendage, for other medical reasons.

More remarkably our prediction that female-to-male transsexuals would have a phantom penis also

seems to be correct. Indeed, more than half of the around 30 female-to-male transsexuals we have interviewed, claim to have experienced this, often since early childhood.

Discussion

We propose a novel and eminently testable hypothesis. If it is correct it would both provide a penetrating insight into the phenomenon of transsexuality and indicate that we have a gender specific body image, with a strong innate component that is ''hard-wired'' into our brains. We suggest that the systematic study of transsexuals would make a significant contribution towards understanding the manner in which nature and nurture interact to link the brain-based internal experience of body image with external sexual morphology; a much neglected and little understood subject.

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