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# Facial Hyposchematia Without Spatial Neglect

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## ABSTRACT

**Introduction:** Hyposchematia is a rare disorder characterized by the underestimation of the size of a part of the body. To date, isolated facial hyposchematia has not been described. The pathophysiology of this syndrome remains poorly understood.

**Methods:** We investigated body schema disturbances and neuroimaging features of 2400 ischemic stroke patients.

**Results:** We found three patients who felt that the left side of their face was disproportionately smaller than the right side. There were no directly observable objective findings in the affected patients. In drawing tasks, the left side of the face in all patients was depicted as more compressed than the right side. In all three patients, the facial hyposchematia was attributed to lesions affecting frontal-insular circuits involved in the upper part of extrapersonal space and self-related systems.

**Conclusion:** These cases demonstrate that distortions and underestimation of extra-personal and personal spaces can affect specific body parts, such as the face, in isolation.

**Key Words:** Body schema disorder, facial, frontal lesion, hyposchematia, space distortion

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## INTRODUCTION

Hyposchematia was coined to describe cases where patients perceive their entire body as smaller than it is. In addition to its use in clinical settings, the term is often applied in the context of drawing tasks, where patients mistakenly reduce the size of one part of an image, particularly when the illusion occurs in a body schema. Because hyposchematia is a subjective phenomenon, it is not directly observable by clinicians. This led to the description of hyperschematia as well (1), where right-brain-damaged patients exhibit overextension in drawings, such as adding unnecessary details to the left side of objects (2,3).

A study by Bisiach et al. (4) explored how right-brain-damaged patients with or without left spatial neglect showed similar tendencies to extend drawings on the left side, despite neglect symptoms not being present in all participants. These patients with intact spatial awareness exhibited leftward narrowing of their drawings (both from memory and copying) and perseveration on the left side, demonstrating a different pattern from those with spatial neglect. Patients experiencing this distortion also showed underestimation of personal and extra-personal space, marked by hyposchematia. In contrast, hyperschematia tends to involve exaggerated drawing responses. Notably, two right-handed patients with right-brain damage and no neglect reported a sensation of their body being smaller on the left side (5).

This paper introduces the novel concept of "facial hyposchematia," a specific form of spatial distortion affecting only the face. This phenomenon has not been previously characterized, as prior research has primarily focused on the body as a whole or on limbs. The current study presents three unique cases of patients with right-brain damage, all of whom exhibit significant distortion of their facial perception, which we term "facial hyposchematia."

## METHODS

We analyzed the clinical and neuroimaging characteristics of three patients with right-brain ischemic strokes. MRI scans were conducted within a week of the stroke using a 3T Scanner (Siemens, Erlangen, Germany). Clinical symptoms, neuropsychological function, and the presence of hyposchematia were assessed using established protocols. Executive functions were evaluated using the Trail Making Test (TMT): Part A (with an average score of <35 indicating executive dysfunction) and Part B (with an average score of <75). Verbal fluency was assessed through a test involving categories of animals and fruits in 60 seconds, with a cutoff of <19 indicating semantic memory impairment (6). Verbal fluency was assessed using a task involving the categorization of animals and fruits, with scores below 19 indicating semantic memory impairment (7). To assess the presence of unilateral spatial neglect (VSN), the Line Bisection Test (LBT) (a series of 18 horizontal lines on a page, where omissions of two or more lines on one half of the page indicate VSN) and the Star Cancellation Test (SCT) (involving 56 small stars and 13 letters, with a cutoff of <44 indicating VSN) were administered (8,9). In the drawing assessment, the patients were provided with a pencil and a 21x30 cm sheet of paper, placed at the patient's midline, and asked to draw four complex figures after being shown a picture of: two trees, a fence, and a house. Additionally, a symmetrical daisy model was printed at the center of a 21 × 29.7 cm sheet, and the patients were asked to draw the daisy. Subsequently, the patients were asked to draw the daisy from memory. Drawing evaluation followed Rode's method, which involved dividing the daisy by drawing a vertical line through the center of the pistil, excluding petals broken by the line, and counting the petals on the left and right sides (2). Finally, the patients were asked to draw their bodies and faces on a 21x30 cm sheet of paper, aligned with the midsagittal plane of their body. Written informed consent was

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## Highlights

- **Hyposchematia is an underestimation of the size of a body part.**
- **Facial hyposchematia has not been described before.**
- **In this article, we presented 3 cases with facial hyposchematia.**
- **Disorder in frontal-insular circuits may have caused this syndrome.**

obtained from the patients for the publication of this case series and any accompanying images.

**Patient 1**: A 61-year-old right-handed male engineer presented with complaints of persistent weakness and abnormal sensations on the left side of his face. He had a medical history of hypertension, diabetes, and smoking but no prior neurological or psychiatric conditions. The patient described waking up with the sensation that the left side of his face appeared smaller than the right. Despite his limbs being unaffected and appearing normal, he could not shake the feeling of asymmetry in his face. As the sensation became persistent, he sought medical attention. Neurological examination revealed that the patient was alert and cooperative with minimal left arm and leg weakness. Facial paralysis was absent, and he was unaware of his motor deficits. The examination revealed mild hemihypoesthesia in the face, though no visual, tactile, or auditory extinction phenomena were present. The Line Bisection Test (LBT) showed no neglect, as he cancelled 39 of 40 lines. In a drawing copy task, he displayed no perseverations or graphic abnormalities, but his self-portrait depicted a marked reduction in the left side of his face. MRI imaging revealed a lesion in the right inferior frontal gyrus (BA44, BA45), orbito-frontal cortex (BA47, BA11), and other related regions, consistent with the presence of a vascular lesion, as confirmed by partial occlusion in the bifurcation of the M2 segment of the right middle cerebral artery.

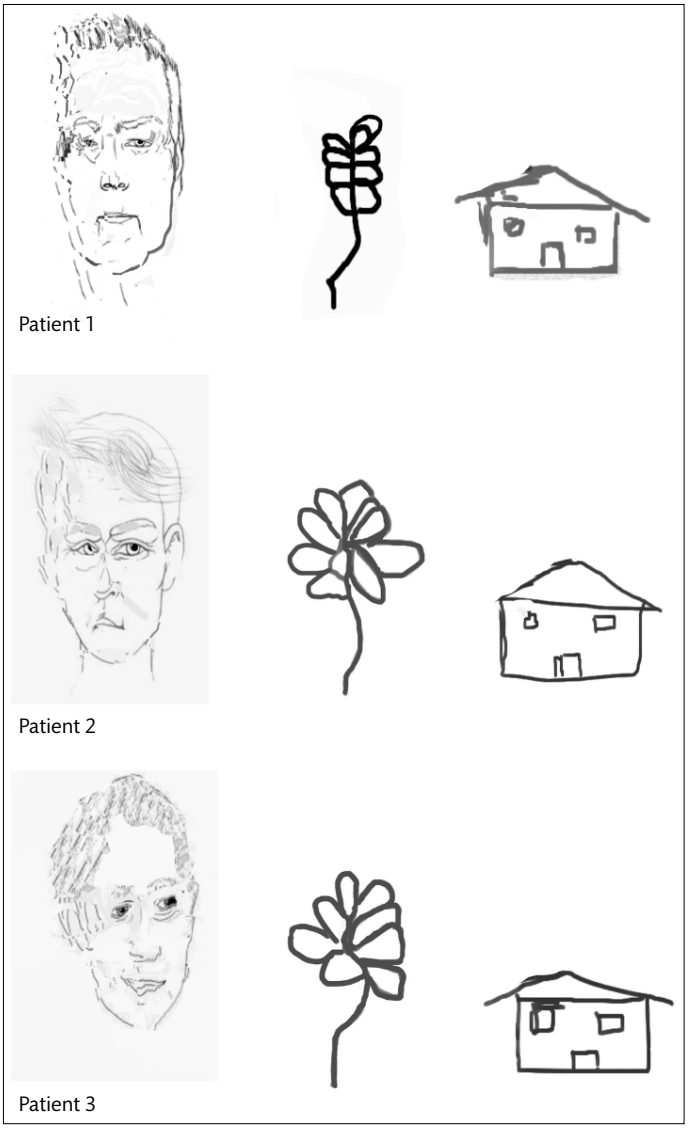


**Figure 1.** Patients showed a contralesional underestimation characterized by systematic left-sided narrowing of face drawings, both copied and from memory. The patients' daisy and house drawings were within normal limits.

**Patient 2**: A 72-year-old right-handed male was admitted following the sudden onset of a sensation that the left side of his face felt "smaller" and "squeezed." His history included hypertension and metabolic syndrome. On examination, he showed left hemiparesis, mild facial involvement, and moderate ataxia, with notable improvement over the subsequent days. Although the motor deficit improved significantly, the patient displayed general apathy and emotional flattening. Neurological evaluation revealed no somatosensory or visual field defects, and no signs of neglect were present. On drawing tasks, the patient produced equal numbers of petals on both sides of a daisy and symmetrical lines on a house. However, in his self-portrait, the left side of his face was drawn smaller and asymmetrical. MRI imaging revealed ischemic changes in the right inferior frontal gyrus (BA44, BA45) and other regions, suggesting damage to cortical areas associated with spatial awareness and facial processing.

**Patient 3**: A 68-year-old right-handed male with 15 years of education and no significant past neurological or psychiatric issues was admitted following the sudden onset of confusion and disorientation. The patient exhibited emotional blunting and mild deficits in executive functions, as reflected by his TMT and verbal fluency scores. He showed no signs of neglect on the Line Cancellation Test (LCT) or Subtraction Cancellation Test (SCT). Upon completing drawing tasks, he depicted a symmetrical daisy with equal petals on both sides but reported that the left side of his face felt "narrow" and "flat." His self-portrait, drawn from memory, showed the left side of his face visibly smaller. MRI scans revealed damage to the right inferior frontal gyrus (BA44, BA45) and orbito-frontal cortex (BA12), consistent with a vascular event, which was confirmed by the presence of right carotid artery dissection on angiography.

## DISCUSSION

Three patients with ischemic strokes reported experiencing a persistent sensation that the left side of their face appeared smaller than the right. In drawing tasks, these patients consistently depicted the left side of objects as smaller than the right. Notably, this distortion was observed in drawings where the left side of the face appeared reduced, with no influence from hand movements or visual control, indicating that the phenomenon was not tied to motor or action deficits in the left space. The distortion occurred in the left visual field, suggesting it was not solely a visual issue.

A key point of differentiation from other conditions is the distinction between hyposchematia and hemimicropsia, a visual perception disorder resulting from damage to the visual association cortex (10). Hemimicropsia leads to a visual perception of one hemifield being smaller, often accompanied by a compensatory drawing of the contralesional side

**Table 1.** Clinical and Demographic Findings.

| Age/Sex | Previous neurologic and psychiatric disorders | Anosognosia for hemiparesis | Autotopagnosia for body parts | Executive dysfunction | Face recognition | Figure perseveration | Line bisection test | Star cancellation test | Locus of lesion | Cause of stroke |
|---|---|---|---|---|---|---|---|---|---|---|
| 1/61/M | None | + | - | + | Normal | + | Normal | Normal | Right inferior frontal gyrus, orbito-frontal cortex, frontopolar cortex, anterior insular cortex, anterior cingulate gyrus | rM1 occlusion |
| 2/72/M | None | - | - | - | Normal | + | Normal | Normal | Right inferior frontal gyrus, orbito-frontal cortex, frontopolar cortex, inferior frontal cortex, anterior insular cortex, anterior cingulate gyrus | Carotid stenosis >80% |
| 3/68/M | None | - | - | + | Normal | + | Normal | Normal | inferior frontal gyrus, orbito-frontal cortex, frontopolar cortex, anterior cingulate gyrus | Carotid artery dissection |

F: female, M: male, L: leg, rM1: M1 segment of right middle cerebral artery.

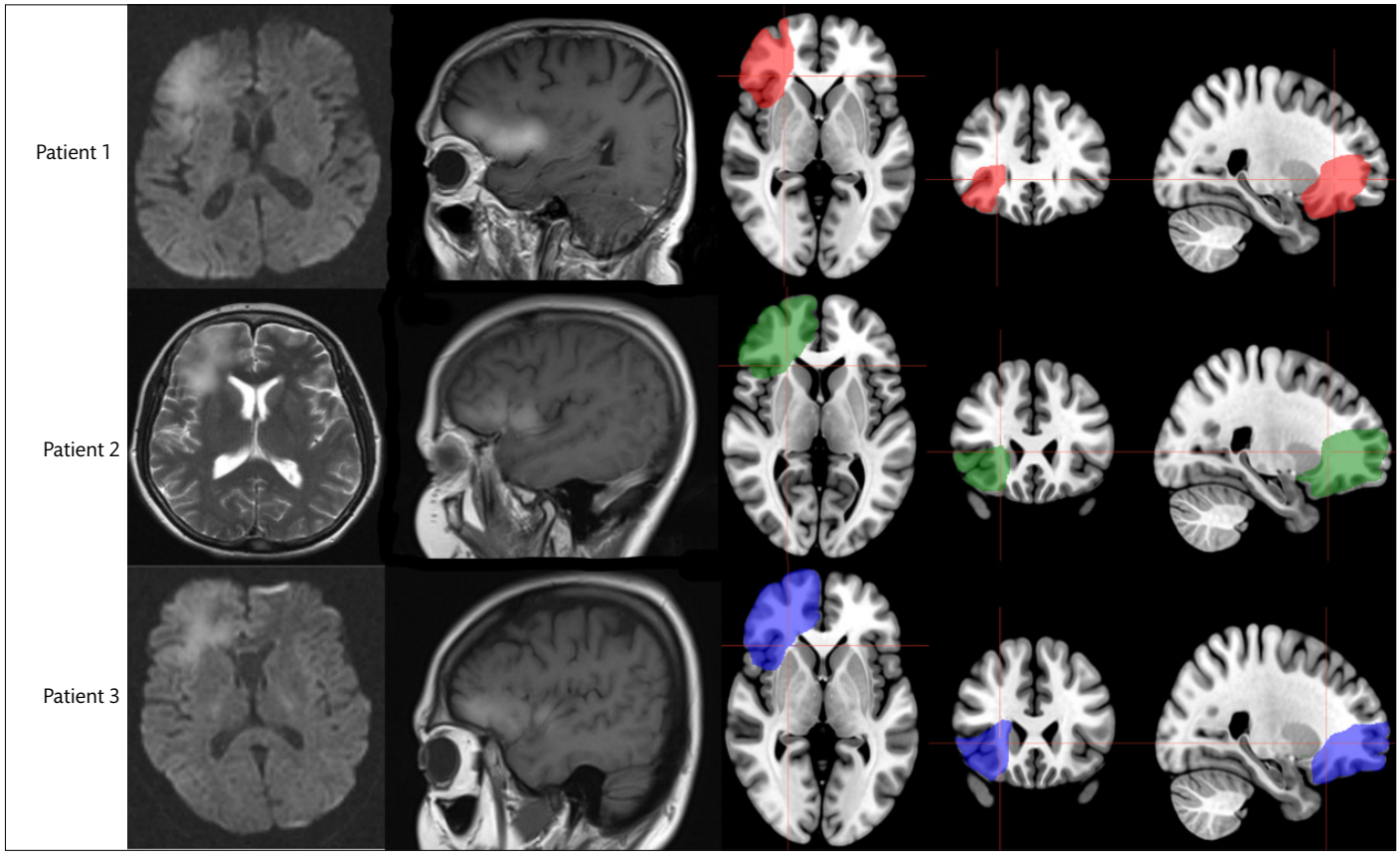


**Figure 2.** Brain magnetic resonance imaging scans obtained in the first week after stroke. Lesions are also shown schematically. Findings are compatible with an acute ischemic lesion involving the right frontopolar cortex, the anterior insular cortex and the anterior cingulate gyrus.

larger than the ipsilesional side to maintain symmetry symmetry (11,12). In contrast, our patients consistently showed a reduction in the size of the left side in their drawings, suggesting that the issue extended beyond visual perception and reflected a distortion of their internal image of the face, rather than a simple visual field deficit.

Personal neglect is another concept that could be confused with hyposchematia (13). It typically involves inattention to the body's

contralateral side and often aligns with asomatognosia, the lack of awareness of one's body parts. However, in these cases, patients did not display neglect or body ownership issues. Despite experiencing a sense of constriction on the left side of their face, they did not demonstrate the characteristic omissions or neglect typically seen in spatial neglect patients. Instead, they added unnecessary details to the left side of their drawings, which might be interpreted as productive behaviors in a distorted spatial context (14,15).

The nature of this distortion suggests that it may stem from a disrupted internal body image representation, possibly influenced by altered vestibular processing (16,17). Interestingly, patients 2 and 3 did not report somatosensory deficits, which could imply that their sensory pathways to the somatosensory cortex were intact. This raises the possibility that the impairment in their facial spatial perception was related to a defect in the vestibular network, which has been implicated in both spatial representation and self-consciousness (3,18,19,20).

Additionally, damage to the anterior insula and frontal structures, as seen in our patients, may have contributed to the observed distortions (10,21,22,23). These brain areas are involved in integrating proprioceptive-somatosensory inputs, and disruptions to this integration could explain the perceptual narrowing of the facial area seen in their drawings.

In conclusion, our cases suggest that hyposchematia may be localized to specific body parts, such as the face, rather than affecting the entire body. This localized distortion could be associated with dysfunction in cortical vestibular areas involved in spatial awareness and self-consciousness, emphasizing the role of these regions in body image processing.

**Informed Consent:** Written consent was obtained from all participants.

**Peer Review:** External Independent.

**Conflict of Interest:** The authors of this article have no actual or potential conflicts of interest.

**Author Contributions:** Concept- EK, DE; Design- EK; Supervision- DE; Source- EK; Materials - EK, DE; Data Collection and/or Processing- DE; Analysis and/or Interpretation- EK, DE; Literature Search- EK; Writing- EK; Critical Reviews- DE.

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## REFERENCES

1. Saj A, Chiuvé SC, Brugger C, van der Meulen M, Assal F. Ipsilateral hyperschematia without spatial neglect after right frontal lesion. J Neurol Sci. 2011;308(1-2):142–143. [Crossref]
2. Rode G, Michel C, Rossetti Y, Boisson D, Vallar G. Left size distortion (hyperschematia) after right brain damage. Neurology. 2006;67(10):1801–1808. [Crossref]
3. Rode G, Vallar G, Revol P, Tilikete C, Jacquin-Courtois S, Rossetti Y, et al. Facial macrosomatognosia and pain in a case of Wallenberg's syndrome: selective effects of vestibular and transcutaneous stimulations. Neuropsychologia. 2012;50(2):245–253. [Crossref]
4. Bisiach E, Ricci R, Mòdona MN. Visual awareness and anisometry of space representation in unilateral neglect: a panoramic investigation by means of a line extension task. Conscious Cogn. 1998;7(3):327–355. [Crossref]
5. Kumral E, Evyapan D, Sirin T, Alpaydin S. Hyposchematia without spatial neglect in 2 patients with lesions involving the insula. Cogn Behav Neurol. 2012;25(3):149–153. [Crossref]
6. Reitan RM. Validity of the Trail Making test as an indicator of organic brain damage. Percept Mot Skills. 1958;8(3):271–276. [Crossref]
7. Lezak MD, Howieson DB, Bigler ED, Tranel D. Neuropsychological Assessment, 5th Ed. Oxford [Oxfordshire]: Oxford University Press; 2012.
8. Plummer P, Morris ME, Dunai J. Assessment of unilateral neglect. Phys Ther. 2003;83(8):732–740.
9. Wilson B, Cockburn J, Halligan P. Development of a behavioral test of visuospatial neglect. Arch Phys Med Rehabil. 1987;68(2):98–101.
10. Cohen L, Gray F, Meyrignac C, Dehaene S, Degos JD. Selective deficit of visual size perception: two cases of hemimicropsia. J Neurol Neurosurg Psychiatry. 1994;57(1):73–78. [Crossref]
11. Kassubek J, Otte M, Wolter T, Greenlee, MW, Mergner T, Lücking CH. Brain imaging in a patient with hemimicropsia. Neuropsychologia. 1993;37(12):1327–1334. [Crossref]
12. Prasad S, Dinkin M. Higher cortical visual disorders. Continuum (Minneap Minn). 2019;25(5):1329–1361. [Crossref]
13. Guariglia C, Antonucci G. Personal and extrapersonal space: a case of neglect dissociation. Neuropsychologia. 1992;30(11):1001–1009. [Crossref]
14. Hécaen H, Angelergues R. Anatomo-clinical study of 280 cases of unilateral retrorolandic lesions of the cerebral hemispheres. Semiological variations as a function in relation to the site and extent of the lesion. Encephale. 1961;50:533–562.
15. Bisiach E, Rusconi ML, Vallar G. Remission of somatoparaphrenic delusion through vestibular stimulation. Neuropsychologia. 1991;29(10):1029–1031. [Crossref]
16. de Vignemont F, Ehrsson HH, Haggard P. Bodily illusions modulate tactile perception. Curr Biol. 2005;15(14):1286–1290. [Crossref]
17. Longo MR, Kammers MP, Gomi H, Tsakiris M, Haggard P. Contraction of body representation induced by proprioceptive conflict. Curr Biol. 2009;19(17):R727–R728. [Crossref]
18. Guldin WO, Grüsser OJ. Is there a vestibular cortex. Trends Neurosci. 1998;21(6):254–259. [Crossref]
19. Devue C, Collette F, Balteau E, Degueldre C, Luxen A, Maquet P, et al. Here I am: the cortical correlates of visual self-recognition. Brain Res. 2007;1143:169–182. [Crossref]
20. Lopez C, Blanke O, Mast FW. The human vestibular cortex revealed by coordinate-based activation likelihood estimation meta-analysis. Neuroscience. 2012;212:159–179. [Crossref]
21. Bottini G, Bisiach E, Sterzi R, Vallar G. Feeling touches in someone else's hand. Neuroreport. 2002;13(2):249–252. [Crossref]
22. Khateb A, Simon SR, Dieguez S, Lazeyras F, Momjian-Mayor I, Blanke O, et al. Seeing the phantom: a functional magnetic resonance imaging study of a supernumerary phantom limb. Ann Neurol. 2009;65(6):698–705. [Crossref]
23. Rode G, Ronchi R, Revol P, Rossetti Y, Jacquin-Courtois S, Rossi I, et al. Hyperschematia after right brain damage: a meaningful entity? Front Hum Neurosci. 2014;28:8. [Crossref]