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Alien Hand: description and treatment of three cases

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Abstract

The Alien Hand Syndrome is a rare and little known syndrome, it is presented in complex clinical pictures that make diagnosis difficult and the incidence underestimated.

It is framed between the disturbances of representation and perception of the body schema.

It is not possible to identify a single anatomical site or a single pathological process capable of provoking the phenomenon of the alien hand; to date, 3 variants have been identified.

There are therefore no standardized treatments supported by evidence of scientific evidence.

We describe the results of a new type of treatment in a color of three cases.

Introduction

The first case of h.s.a. was described in 1908 by the German neurologist Kurt Goldstein [1].

In 1972 Brion and Jedynak described the observation of 4 patients [2].

The discovery of mirror neurons in the 90s, and recent studies Marti-Fabregas 2000, [13] Terazzi 2010, [14] Kim 2011, [15] Hertza 2012, [16] Shereef 2013 [17], have reaffirmed the importance of the ways of vision, (semantic understanding, action in context, verification of the action), as basic elements in the elicitation and regulation of the automatic and voluntary movement. Voluntary movement and action, therefore, arise from the interaction of internal drives or wills, with the need to move and interact with the surrounding space, in relation to the context and the approach to the object; whether it is an action carried out in an implicit pragmatic or explicit way.

The connections between the parietal areas (intraparietal lobule) and the premotric areas of the frontal lobe are therefore decisive.

This explains how the AHS is often present in cases of lesions of the parietal cortex, especially the right one, in which an interruption is created between this and the other cortical areas.

This interruption prevents the efferent copy of the planned movement from reaching the posterior parietal lobe from the premotor areas. Failure to compare the copy, with the re-afferent somatosensory information from the motor periphery, does not create the sense of self-generated action, and causes in the subject the sensation that the movement was generated by a force external to itself [18].

Treatment

A.H.S. is a disease often difficult to diagnose. There are therefore no standardized treatments supported by evidence of scientific evidence. Traditional treatments consist in engaging the hand in activities that do not interfere with the actions of the right hand (to hold or manipulate objects). Other proposed treatments:

-Biofeedback e.m.g. with alarm signals, which seems to reduce the holding time of an object by the alien hand.

-Learning of motor tasks oriented to the contact of the alien hand with specific objects in particularly poor environmental contexts.

-Use of orthosis or restraints for the alien hand and the occlusive bandage (questionable as a hand with motor capacity).

-Waiting for spontaneous recovery or reduction of the phenomenon that sometimes appears in isolated lesions in the course of a year or so [25].

Materials and methods

Take in charge in rehabilitation unit of three clinical cases:

Clinical cases: 1

acute onset: 46 year old woman, entry diagnosis: post-anoxic coma due to cardio-circulatory arrest; rmn: widespread axonal damage. Physical examination at the admittance:

vigilant, uncooperative, disorientated in space, in time and in the person, global coordination deficit, postural passages with high level of assistance and tendency to retropulsion, motor aphasia, ideo-motor apraxia; phenomenon of the left alien limb with embodyment; in orthostastism:

altered trunk control and balance control, with a tendency to retropulsion, perceptual disturbance for the posterior space. In the rehabilitation of orthostatism, gait and walking, the patient was educated

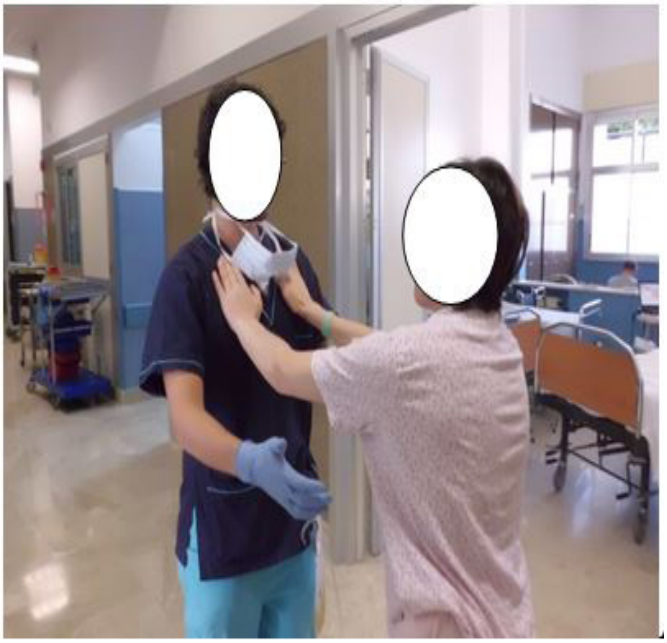

***Figure 1**: During the walk, both hands were resting on the physiotherapist's trunk, and the delivery was not to detach them. In this way the patient was able to control the retropulsion.*

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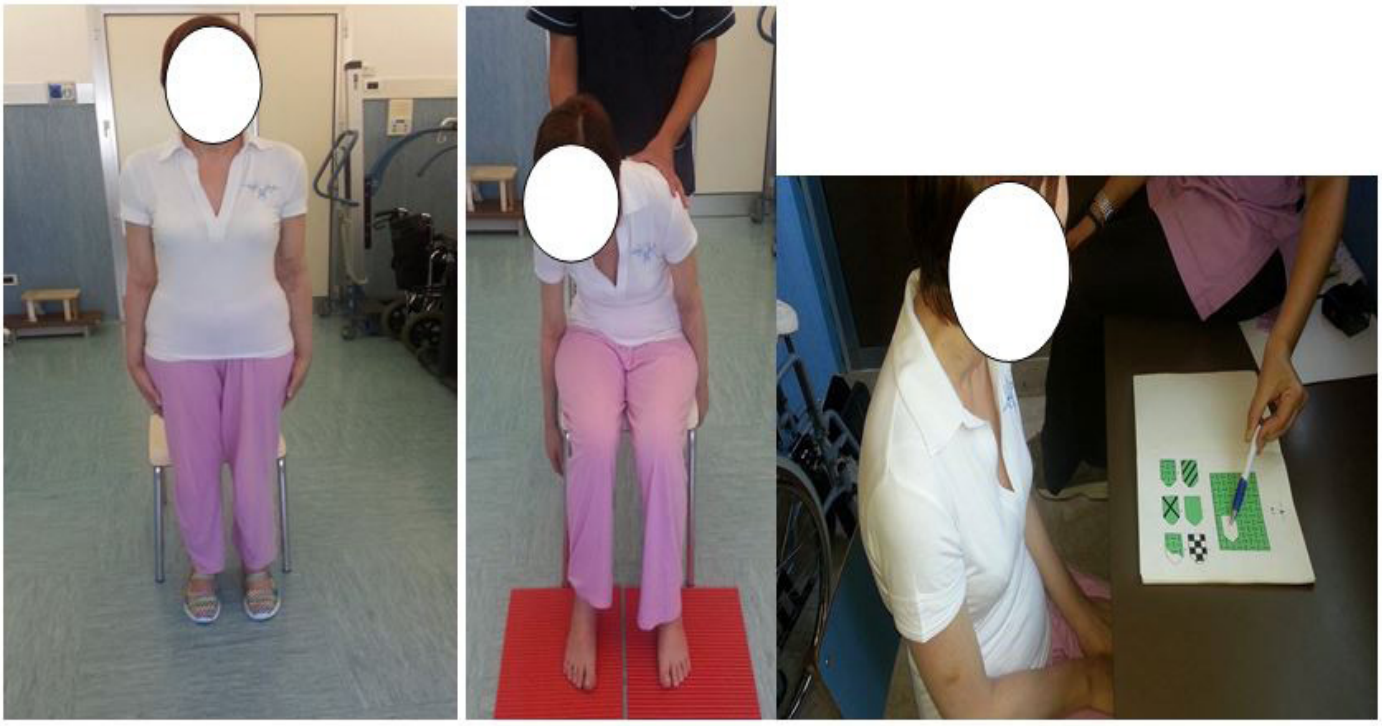

***Figure 2**: Denomination in orthostatism; Exercises of distribution of body weight and of space-body relationship and between body parts; Cognitive rehabilitation with Raven matrices.*

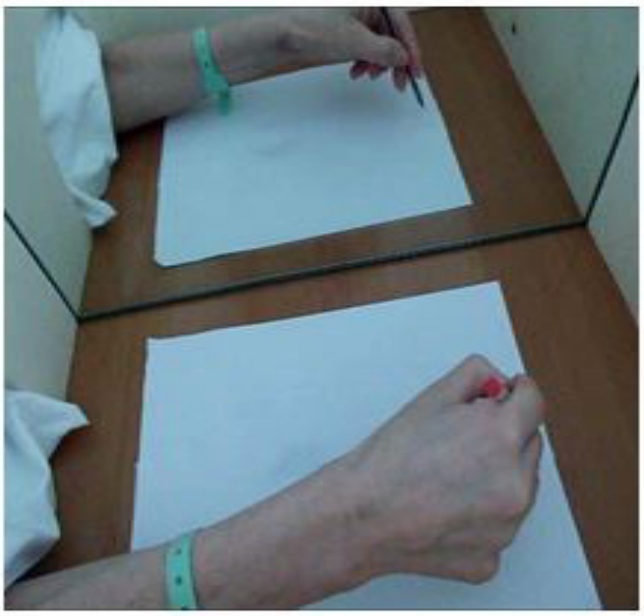

***Figure 3:** Treatment in Mirror Box.*

***Figure 4:** Diagnostic Check.*

***Figure 5:** Case 2 treatment with activities of daily living.*

in a standing position to name the parts of her body.

Effective treatment is based on neurocognitive rehabilitation techniques such as mirror box therapy [26,27].

You get the false but vivid impression of looking at both hands. It is important that the position is congruent with the point of view and that there are no distractions. By placing the alien hand behind the mirror and the other at the front, and looking at the mirror from a right angle, one sees the reflex of the hand overlapping the perceived position of the other hand. It was as if the brain had unlearned the learned disorder [28].

When the brain is faced with a chaos of conflicting sensory input, no sensorial feedback, helpless copies of motor signals, and in M.B. finds discrepant visual feedback sent from the mirror box, then it resorts to negation.

As in Garbarini's study, lines and circles were correctly executed by R.G. with the right and normal right hand; the phenomenon of Embodyment manifested itself only if the examiner's hand was the sin and was placed in an egocentric position [29,30].

Clinical cases: 2

Man of 69 years. Entry diagnosis: right hemiplegia and sin emiparesis, fluent aphasia, spatial emineglancy u.l. - TAC left parieto-temporore-insular hemorrhage and temp. Right, subdural hematoma parieto-occip.dx. Clinical issues: double hemiparesis (right> sin), sin spatial emineglect, sensory aphasia, mixed dysphagia, ideo-motor apraxia, sustained attention deficit and short-term memory and behavioral disorders.

During hospitalization there was an improvement in the clinical conditions of the patient and recruitment of the right half-body.

Appearance of: Acalculia, Disgrafia, Lack of use of the upper left limb in the performance of the ADL (despite the good motor recruitment), Spontaneous "grasping" type of spontaneous movements; Lack of recognition of the left upper limb as its own; Confabulations.

Through the rehabilitation process, Mr. there is. it has recovered the sense of belonging and the voluntary control of one's upper left limb.

Clinical cases: 3

A 71-year-old right-handed woman developed acute left hemiparesis and visual hallucinations. She also complained that her left hand uncontrollably scratched her and pulled at her hair. Past medical history was notable for chronic hypertension and diabetes. Clinical evaluation disclosed full orientation, left lower facial weakness, right gaze bias, left hemibody hypesthesia, and extensor posturing of the left limbs, with the left hand constantly clenched. Cranial CT scan indicated acute right parietal cortical infarct and extensive bilateral subcortical white matter ischemic changes.

Results

In all cases the treatment started immediately after the post-acute phase, during a period of hospitalization that lasted a few months; it continued later in Rehabilitative Day Hospital;

it ended in an outpatient procedure. Treatmets were a close integration of team professionals is required, aimed at objectives, for the treatment of motor disorders, communicative and cognitive / behavioral linguistics. In our experience two clinical cases treated with cognitive therapeutic exercise, logopedic and cognitive rehabilitation. The first, a young patient> 40 years, now serves as O.S.S. The seconda patient> 65 is retired and now lives at home with his wife. The third patient is now at home with surveillance.

Conclusion

The objectives of the rehabilitation project, shared by the team, are the finalized recovery:

- of the consciousness of the corporeal self,
- of muscle recruitment under conscious and voluntary control,
- of the coordinated and independent movement of the two arts,
- of the topographic relationship between the different parts of the body,
- motor autonomy from sitting, standing and walking, - use praxies
- of the representation and perception of the body and of space,
- of the communication skills relevant and appropriate to the context,
- of the remaining visuospatial, attentive and executive cognitive abilities.

Treatment of motor disorders: In light of the most recent findings in the rehabilitative field, the motor recovery process seems to be closely related to sensory stimulation. In support of this statement very interesting and used are the rehabilitation exercises according to the modern revision of the cognitive therapeutic exercise that in light of the latest revisions has taken the name of CTA (Comparison of Actions) [31].

This new rehabilitative approach is inspired by the cognitive theory according to which the recovery of the patient, seen as a process of learning in pathological conditions, is a consequence of the activation of cognitive processes and the way in which they are activated [32].

The fundamental points are:

Rehabilitation as learning, in fact learning is seen as the ability of the SNC to learn through experience. Therapeutic exercise is understood as a problematic situation, in which the patient must structure a series of mental options (perceptual hypotheses to be verified through exercise) that lead him to hypothesize the solution of the problem proposed by the therapist. Through the "exercise problem" the patient learns to recognize, through sensitivity, the incoming stimuli, elaborates them, pays attention to them, concentrates on their own body, tries to give answers, makes hypotheses for solving the given task, active multiple cortical and subcortical areas. Body as a receptor surface or the body allows the patient to relate to the outside world through sensory information and movement. Movement as knowledge because the movement aims to know the external reality and therefore becomes a finalized gesture [33].

At the same time the speech therapist will have to rehabilitate speech disorders both in production and in comprehension in order to recover communication and interpersonal skills.

Also in this sense the exercises can be addressed to the naming and repetition of syllables and simple sentences or to the recovery of phonemic, semantic and lexical abilities in real life contexts, through figures that reproduce actions of everyday life.

The recovery of cognitive skills will be taken care of by the team neuropsychologist, with exercises aimed at the recovery of divided and sustained attention, the overcoming of personal and / or spatial eminegligence with exercises recalling attention to the neglected side, with positive feedback.

The recovery of the disturbances of body representation will therefore be based on the inter-professional and contemporary rehabilitative action of the physiatrist, physiotherapist, speech therapist, neuropsychologist and orthoptist in the presence of hemianopsia or ocular convergence disorders responsible for diplopia.

In fact, the work on the patient's body or on representations consisting of complete figures or missing parts, which is carried out by the neuropsychologist, will simultaneously require the physiotherapist to help the patient in the execution of deficitary movements and the speech therapist to overcome problems of comprehension early. linguistics that would risk nullifying the execution of the exercise due to lack of understanding on the part of the patient.

Discussion

It is reasonable to believe that the cases of Alien Hand Syndrome are underestimated, both due to the lack of knowledge of the phenomenon and the difficulties in identifying it.

These difficulties are often linked to the severity of motor disability, flaccid or spastic hemiplegia, apraxia, hemisomatoagnosia, both to difficulties in communication skills, global aphasia, and also to the association of other visuospatial cognitive disorders.

Surely in all those patients who have disturbances of body representation and / or disturbances in the representation of space, the phenomenon must be carefully researched.

Often the phenomenon resolves spontaneously in the first six months after the acute event, but in many cases, if not detected or not treated, it can constitute a serious impairment for the person, who may also have recovered the selective motor capacity of the hand, to sometimes even with a satisfactory force, but is not able to use it.

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