

PUDENCY AND THE PREFRONTAL CEREBRAL CORTEX

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Accepted

Pudency is a feeling of self-consciousness, decency, discretion, shyness and bashfulness linked to the issues of voluptuousness, of the bodily and spiritual pleasures and delights.

It involves the observance of the good manners, of the decorum and of the common sense, thus preventing the individuals to do or to say anything indecent in connection with the sexual issues.

Nevertheless, prefrontal cortex is the most distinctively “cognitive” and behavioral part of the brain. In addition, the prefrontal cortex has regions for emotional and personality processes, as well as for pudency (sense of decency), and social cognition knowing “how to behave”, for example.

In the following section we shall present the three prefrontal lobe syndromes: (1) the dorsolateral prefrontal syndrome; (2) the orbitofrontal syndrome; and (3) the medial prefrontal syndrome, as well the symptomatology in whose context appear the degradation of the sense of pudency.

Keywords: Pudency, prefrontal cortex, dorsolateral prefrontal syndrome, orbitofrontal cortex, medial prefrontal syndrome.

INTRODUCTION

Pudency is a feeling of self-consciousness, decency, reservedness, discretion, shyness and bashfulness linked to the issues of voluptuousness, of the bodily and spiritual pleasures and delights.

It involves the observance of the good manners, of the decorum and of the common sense, thus preventing the individuals to do or to say anything indecent in connection with the sexual issues. In the general way of things, pudency is reflected, or is manifested through actions, attitudes, behaviours, approaches, body postures and manners of dressing which are adequately put forth with bashfulness, shyness and noble-mindedness in order to eliminate the tendency to attract and gain the adherence of the persons of the opposite sex to the lascivious, impudent, sensual and obscene acts of voluptuousness. The extravagant luxury, the enchanting gesticulation and the manner of dressing which have the single objective to attract the persons of the opposite sex with the purpose to achieve an extremely intense fulfilment of the bodily instincts and lust, or in order to gain certain material benefits, are already considered to be within the purview of the deliberate or pathological

abnormal behaviours or as an indication of the lack of self-control.

But the self-control can be influenced by a multitude of profoundly immoral commercial messages and advertisements.

This pornographic intoxication of the noetic feelings which is addressed to the spirit is much more difficult to weed out than the toxicity itself.

In order to perform the washing out of this informational abjectness we don't have at our disposal and it is not available any medicine which might heal this ghoulish wound of the mind or which can help direct us towards the behaviours which are more adequate for the normal life situations.

In many instances, mainly in the cases in which there are injuries of the prefrontal lobe, they rouse up, especially in the young individuals, whiplashes of the immoral desires which lay siege to their attention, willpower, and even life itself.

When the power of the mind moves against the nature, when reason goes out the window, it becomes preoccupied especially by pleasures.

We live today in a world of pleasure, which intensifies the desire to reduce the distances between the appetite for pleasure and its fulfilment.

In contrast to this, there are numerous passages of the philocalic writings which talk us round with

regard to the importance of a close supervision of our thoughts, words and actions, as well of our life in its entirety.

Normally, the mind functions without wanderings and with no passionate perspectives, with cleanliness and pudency with regard to the reality and the rationality of the various processes, these being relatively consistent modalities for the referencing of the individual in relation to certain aspects of the social life, as well as to his own person.

It is natural that the individuals should not follow up only the living up of the voluptuousness through extremely intense feelings, appetites or sprees, that is of the indwelling and bodily pleasures which are induced by the sexual intercourse.

METHODS

After more than half a century of continuous and intense activity in the field of neurosurgery, I had observed that the sense of pudency was dependant on the activity of the prefrontal cortex.

The prefrontal cortex is the most forward part of the frontal lobe of the cerebral cortex^{1,2}.

The prefrontal cortex is a major subdivision of the cerebral cortex, which plays a critical role in the initiation of activities, in the detection and in the resolving of the conflicting plans for action, as well as in the mediation of complex processes such as attention, planning, decision making, emotion, and personality, and it is responsible for the evaluation of our actions as being either a success or a failure relative to our intention^{3,4}.

Nevertheless, the prefrontal cortex is the most distinctively cognitive and behavioural part of the brain.

As the seat of goals, foresight, and planning, the frontal lobes are perhaps the most uniquely human of all the components of the human brain.

Thus, prefrontal cortex plays the central role in the initiation of activities, in establishing the goals and objectives and then in the devising of the plans of action which are required in order to reach these goals³.

The physiology of a cortical region can be studied and comprehended only in the context of its anatomical connections with the other structures.

The functions of the prefrontal cortex, which are to some extent still unclear, are reciprocally supporting and complete each other during the implementation of an individual action.

The prefrontal cortex would not represent anything if it would not work in conjunction with other cortical areas, with the subcortical structures, as well as with certain areas of the motor and sensorial structures and with those of the autonomous nervous system.

As a whole, the prefrontal cortex contributes to: the achievement of the emotional functions, the sequential control of the behaviours which are necessary for the planning and the settlement of problem-solving, of the abilities and of the success in the real life, the inhibition of the inadequate responses, the automation of various actions, the ephoration of the adequate decisional and creative capabilities and the successful projection in the past, as well as in the future.

The planning and the decision making are the two major functions of the prefrontal cortex⁵.

During the progress of the sequences which are directed towards the achievement of a certain purpose, the signals from the internal and the external environment are processed hierarchically, whereupon the internal signals are sent towards to the orbital prefrontal cortex while the external signals are directed towards the lateral prefrontal cortex.

There, the signals which had been mentioned above will mould or will generate other actions which will enter in the processing cycle of the internal or external environment which they will change until the achievement of the intended purpose.

At each hierarchic level of the cycle there are generated feedback connections with the previous levels.

Without this structuring it will not be possible the occurrence of any new executive acts, either acquired or behaviourally wrought, of any fluent speech acts, of any superior rational processes, as well as of any creative activities².

The prefrontal cortex is located on the lateral orbital medial surface of the most anterior portion of the frontal lobe. The prefrontal cortex is the non-motor part of the frontal cortex².

In humans, there is no primary sulcus which demarcates the posterior limit of the prefrontal cortex.

In the following section we shall present the three prefrontal lobe syndromes: (1) the dorsolateral prefrontal syndrome; (2) the orbitofrontal syndrome; and (3) the medial prefrontal syndrome, as well as the symptomatology in whose context into which fits the degradation of the sense of pudency.

THE DORSOLATERAL PREFRONTAL SYNDROME

The injury of the lateral areas of the prefrontal lobes is manifested through an acquired sociopathy which comprises the following symptoms: the degradation of the sense of pudency (Figure 1), the inability to inhibit the inadequate responses, the disinhibition of the instinctive behaviours, the absence of the critical sense, the disappearance of pudency, the inability to achieve self-monitoring, the distancing of the individual from the environment, the absence of the mental flexibility and of creativity, the lack of the ability to make decisions and to plan the required actions, the inability to control the behavioural sequences, the

anchorage of the individual in the present, the incapacity of the individuals to project themselves accurately and successfully both in the past and in the future, the abolishment of the degree of appropriateness of the behaviour and of the capability to anticipate the outcomes of the individual actions, as well as defects in the control, the regulation, and the integration of the cognitive activities (Figure 2). The defects in the control, the regulation, and the integration of the cognitive activities tend to predominate in the patients with dorsolateral lesions, i.e., when the lesion is located on the top or on the outer side -the convexity- of the prefrontal lobes. This syndrome had been described as being a metacognitive disorganization which reflects a reduced state of mental control.

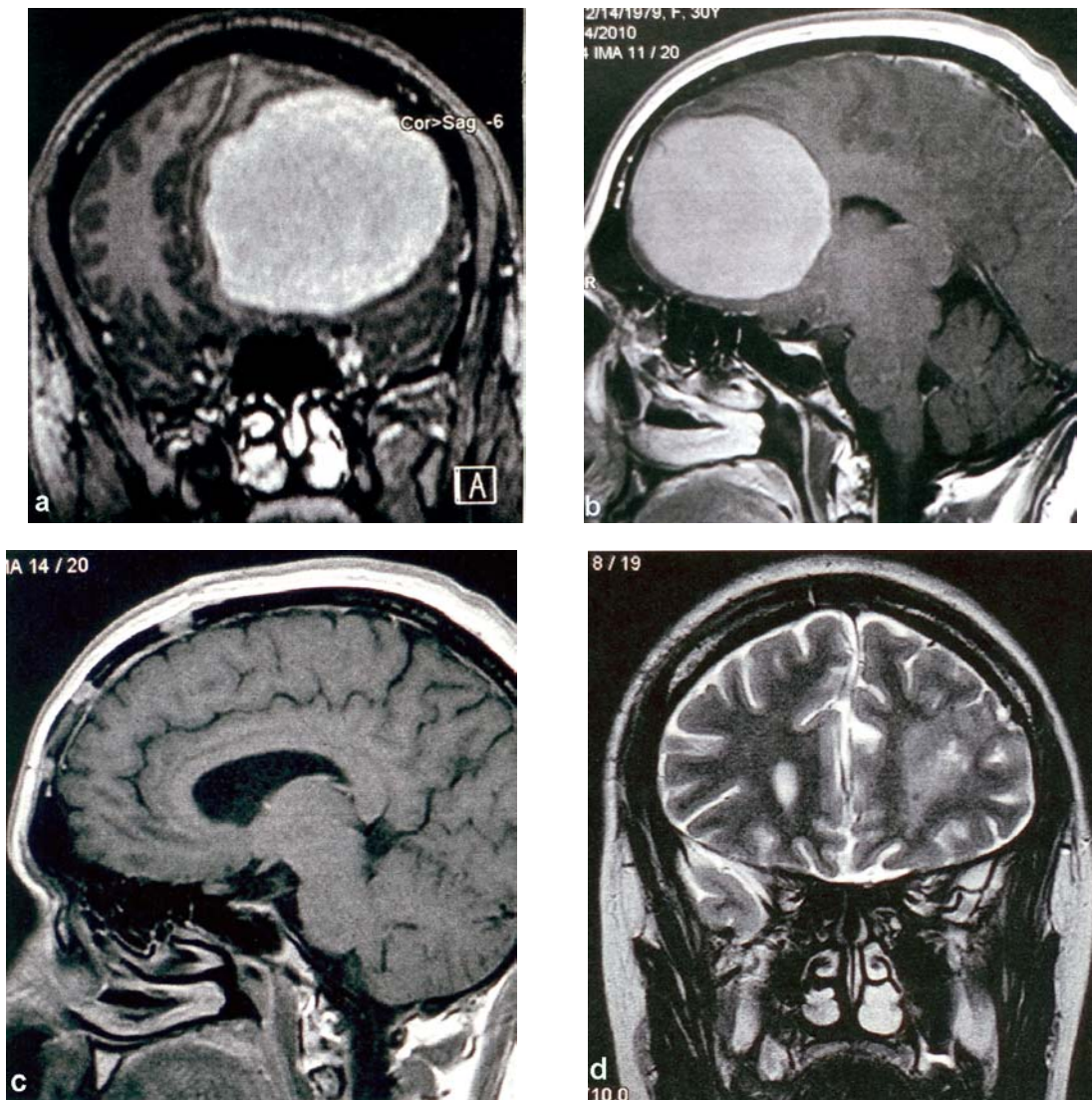


Figure 1. A 30-year-old woman who, besides the disorders which are specific to the dorsolateral prefrontal cortex, had also presented the degradation of the sense of pudency. The magnetic resonance imaging (MRI) examination had revealed on the anteroposterior and on the lateral images a large left prefrontal convexal meningioma (Figures 1a and 1b) which had been surgically resected in its entirety (Figures 1c and 1d) (surgeon Leon Danaila). The entire symptomatology had disappeared after the surgical treatment.

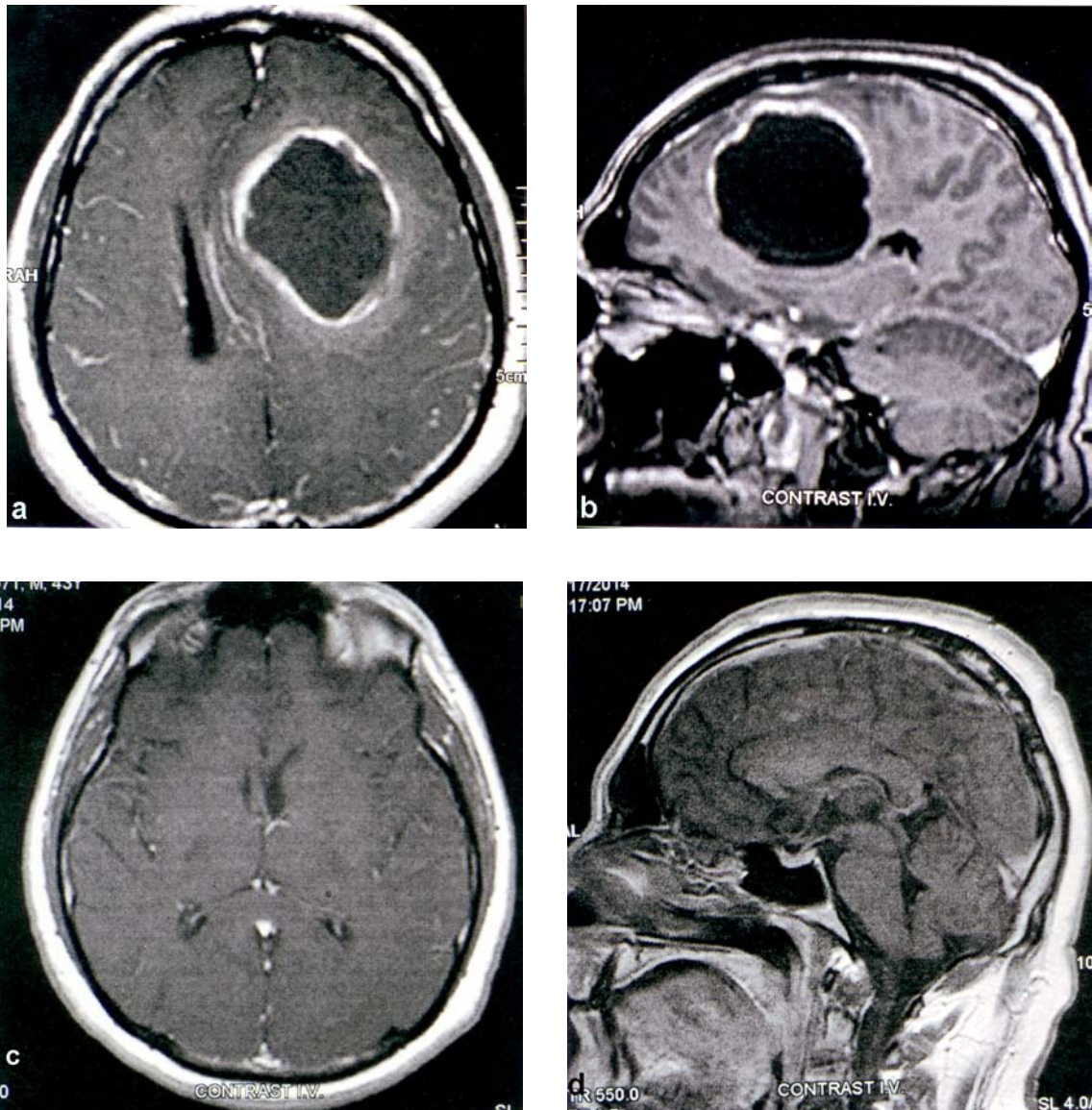


Figure 2. A 43-year-old woman who had presented with a 2-month history of moderate weakness on the right side, headache, the degradation of the sense of pudency and other disorders specific to lesions of the dorsolateral prefrontal cortex which had been described in the text. The preoperative computed tomography (CT) scan shows the presence of a well-circumscribed left side frontal cystic astrocytoma (a and b). The postoperative CT scan demonstrates the complete removal of the tumour (c and d) (surgeon Leon Danaila). After four months the frontal syndrome had disappeared.

The persons concerned perform fairly well at tests, but they demonstrate an unintelligent performance in the everyday life.

THE ORBITOFRONTAL CORTEX

The orbitofrontal cortex lines the ventral surface of the frontal lobe on the floor of the anterior cranial fossa. The orbital (basal, ventral) prefrontal cortex plays a key role in impulse control and in the regulation and the maintenance of the on-going behaviour. In the healthy persons,

this region is involved in the expression of the aggressive behaviour, but the intellect is not grossly impaired.

The damage located here can give rise to disinhibition and impulsivity, with associated behavioural problems such as aggressive outburst, misplaced jokes or withering scorns, beatitude, silliness, puerility, euphoria, disinterest, stereotypies, perseverations, the degradation of the self-criticism, of the a moral sense, the lack of the sense of pudency and sexual promiscuity (Figures 3 and 4).

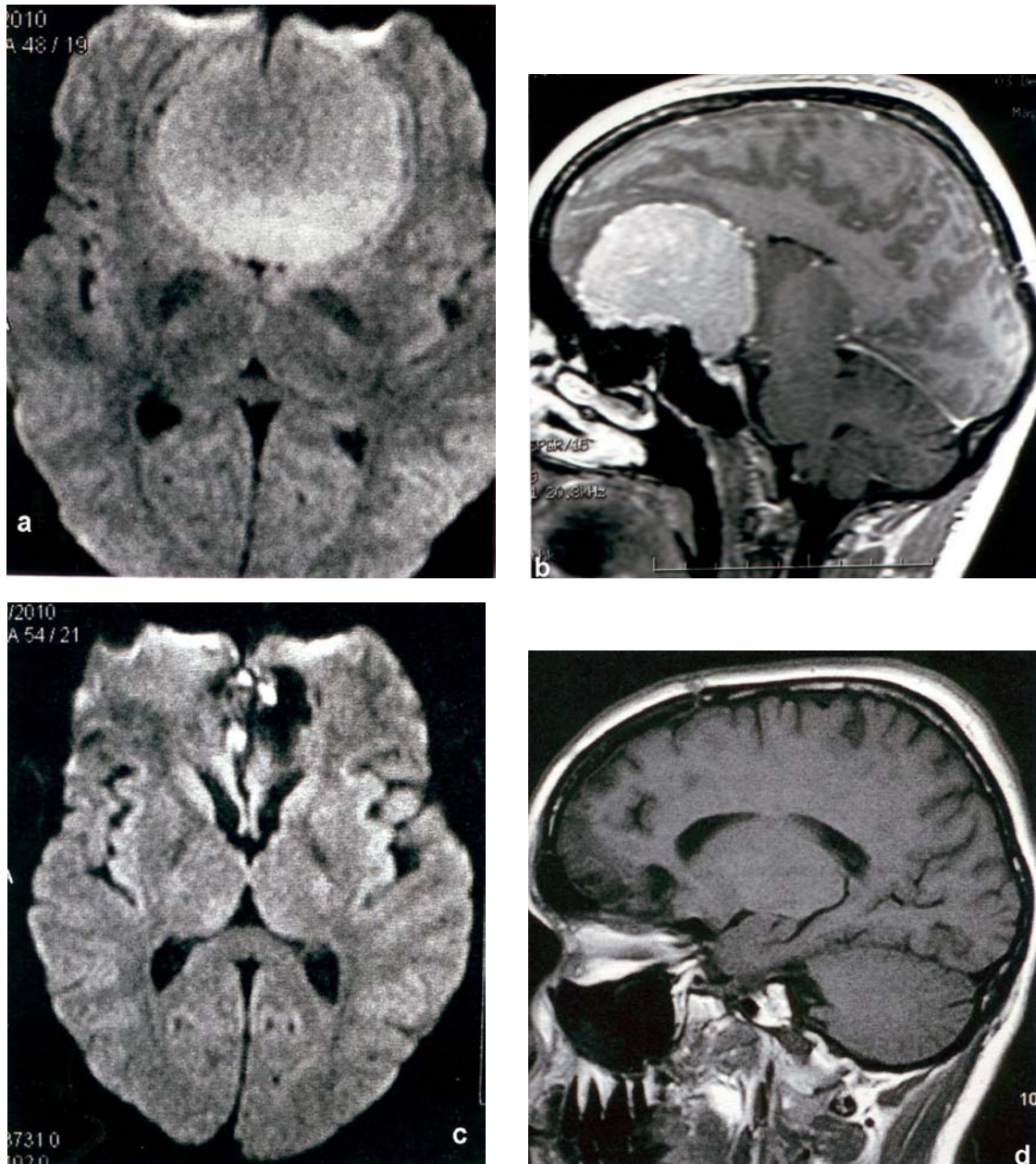


Figure 3. An olfactory groove meningioma in a 37-year-old woman who had received treatment for the degradation of the sense of pudency and for other psychiatric problems. The CT scan images with contrast enhancement had shown the enhancing lesion located on the midline of the anterior part of the floor of the frontal fossa (a big olfactory groove meningioma) (a and b). The axial and the lateral images of the postoperative contrast-enhanced CT scan reveal the complete resection of the tumour (c and d). The frontal syndrome had disappeared after surgery (surgeon Leon Danaila).

The lesions located in the orbital frontal cortex can also disrupt a patient's ability to be guided by the future consequences of his or her actions, thus leading to poor decision-making^{2,6}. However, they have no foresight of the consequences of their actions.

Thus, there are marked abnormalities in the realms of reasoning, personal and social decision-making, emotional control, and feelings.

The disruption in the ability to control the feelings and the emotions often results in explosive

aggressive outbursts which are characterized by socially unacceptable, tactless, as well as vulgar manifestations⁶.

The most common causes of the orbitofrontal syndrome include ventral frontal meningiomas, arteriovenous malformations (Figures 5 and 6), injuries following the acceleration-deceleration head trauma, viral infections (*e.g.*, the *Herpes simplex* encephalitis and the Creutzfeldt-Jacobs disease), as well a multiple^{2,6}.

The patients with the orbitofrontal syndrome (due to cerebral tumours, cerebrovascular illnesses, and head injuries) are known to be “selfish”, boastful, puerile, profane and sexually explicit.

These patients might engage in shoplifting, in sexually aggressive behaviours, in reckless driving,

or in other actions which are commonly perceived as being antisocial.

Thus, this disinhibited and euphoric syndrome which is characterized by impulsivity, social inappropriate behaviour, aggressiveness and sexual disinhibition had been attributed to the orbitofrontal regions⁶.

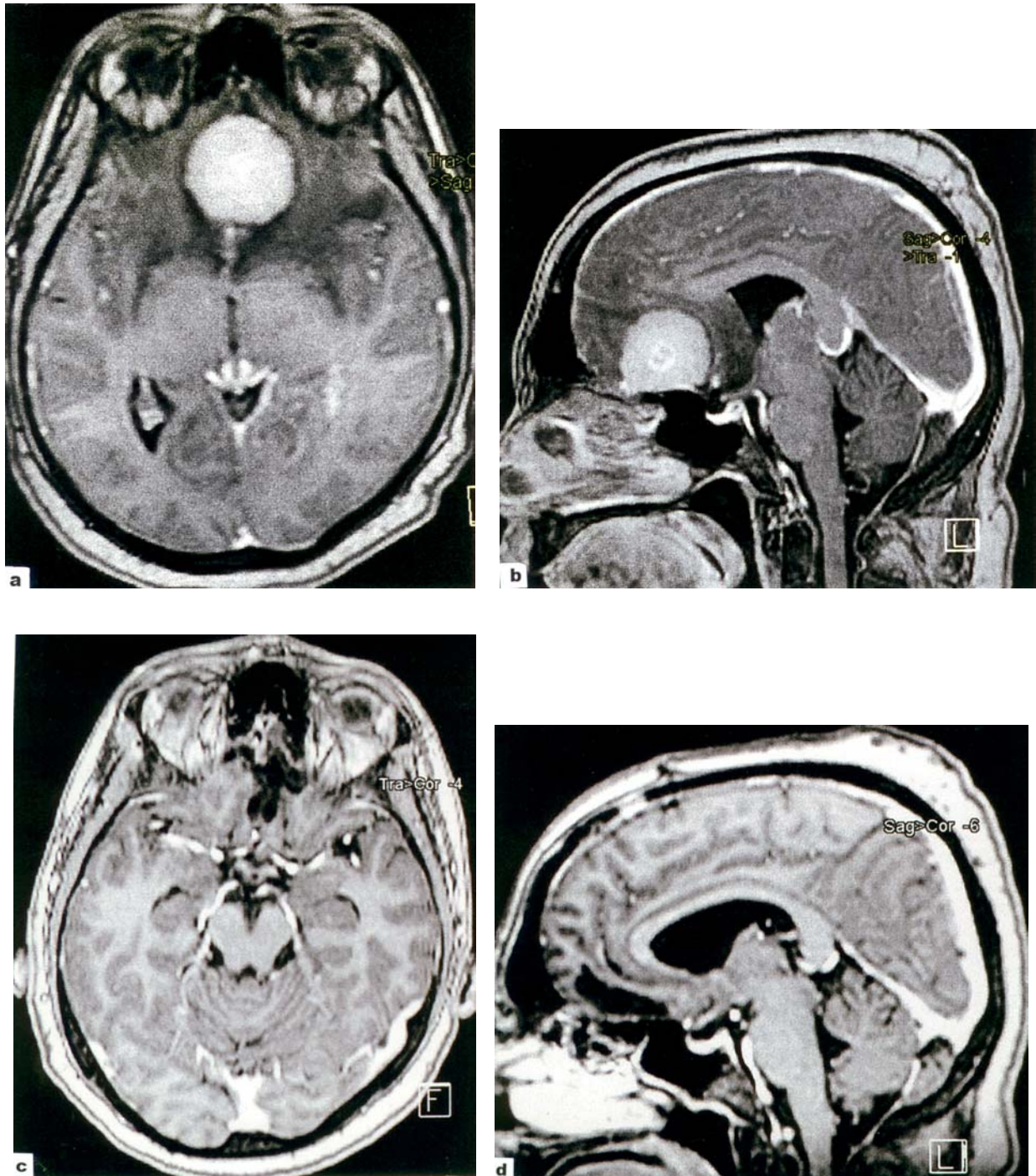


Figure 4. An olfactory groove meningioma in a 49-year-old woman who, besides several moderate characteristic disorders caused by the compression of the orbital prefrontal cortex, had also presented the degradation of the sense of pudency. The magnetic resonance imaging (MRI) examination reveals an olfactory groove meningioma with bilateral extension (a and b), which had been surgically resected in its entirety (c and d). The symptomatology had disappeared after the surgical treatment (surgeon Leon Danaila).

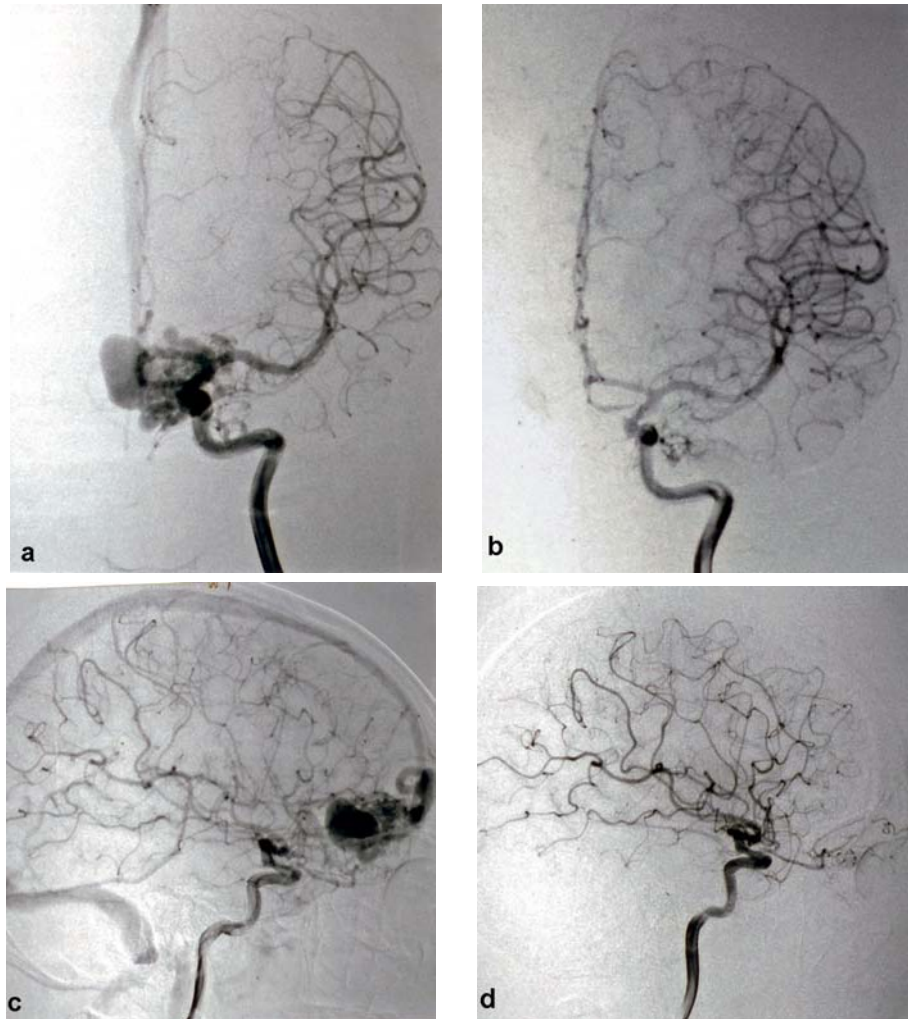


Figure 5. Anteroposterior (a) and lateral (c) views of a left internal carotid artery angiogram that reveal the presence of a Spetzler-Martin Grade III arteriovenous malformation which was fed by the anterior cerebral arteries and drained in the anterior part of the superior sagittal sinus. The postoperative left internal carotid angiography had demonstrated the complete resection of the arteriovenous malformation (b and d) (surgeon Leon Danaïla). This 45-year-old woman presented a partial degradation of the sense of pudency and also several other symptoms which are characteristic for the deterioration of the orbital prefrontal cortex. The entire symptomatology had disappeared after the surgical treatment.

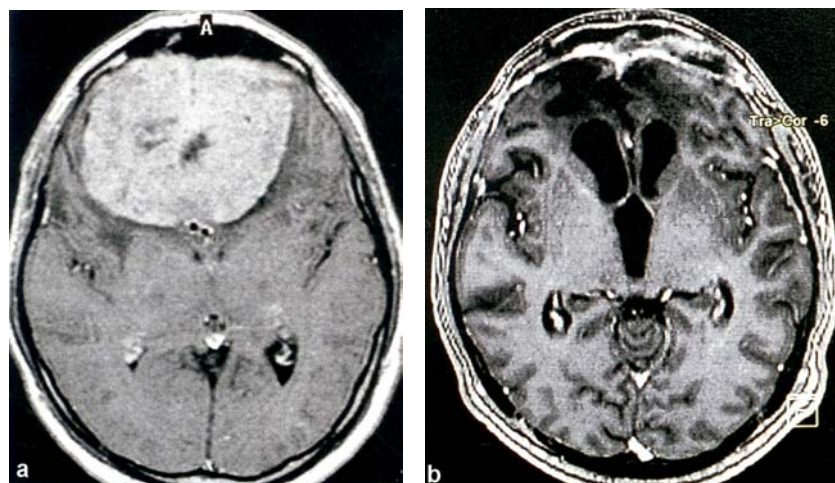


Figure 6. The preoperative contrast-enhanced computed tomography (CT) scan of a 29-year-old man which shows the presence of a giant size olfactory groove meningioma (a). The postoperative contrast-enhanced CT scan had shown no residual tumour (b). The patient had been admitted in the hospital because he had an important degradation of the sense of pudency associated with an orbitofrontal syndrome, which had disappeared after the surgical resection of the tumour (surgeon Leon Danaïla).

THE MEDIAL PREFRONTAL SYNDROME

The anterior cingulate cortex occupies a mid-frontal position, and it is closely linked to the prefrontal cortex. The anterior cingulate cortex had been traditionally linked to emotion. According to Posner and Rothbart (1998), it also plays a role in the social development through the regulation of distress.

The hallmark feature of the medial apathetic syndrome is a severe reduction in spontaneity and motivation.

Thus, the patients with medial syndrome are able to generate internally organized plans for action, but they lack the impetus to carry them out. This syndrome is also characterized by a reduced interest in the environment⁶.

In general, the patient has a flattened affect, which is illustrated by a blunted facial expansion.

The overall alteration in motivation and in motor activity is a result of the lesions which involve the medial motor^{1,2,7}.

The lesions that involve the pathways which connect the cortical areas located between, and just under the hemispheres with the drive and affective integration centres in the diencephalon are the most apt to affect the emotional and the social behaviour by dampening or nullifying altogether the capacities emotional experience as well as those for drive and motivation^{8,9}.

The patients who sustain damage at the level of the frontal areas of the brain, with the loss of the affective capacity, will have low drive states, even for the basic needs as those for food or drink; in those who are only moderately muted emotionally, the life-sustaining drives will remain intact, but the sexual interest might be reduced, along with the interest in initiating and maintaining the social or the vocational activities. Another deficit was the loss of the control of the urinary and rectal sphincters due to the involvement of the voluntary motor centres located in the paracentral area.

Cairns, in 1941, and Kreindler, Macovei, Cardas and Danailă, in 1966, had described the akinetic mutism which was produced by the lesions of the medial-basal prefrontal regions.

The clinical conditions are characterized by absolute mutism and complete immobility, with the exception of the eyes which are kept open and move in all directions. The patient appears to be awake and maintains a sleep-wake cycle, but there cannot be established any communications with the patient, through either painful or auditory stimuli.

Consequently, we can assert that the medial surface of the prefrontal lobe plays a minor role in the sense of decency, which is nothing more than the feeling of pudency.

The most common causes of the medial prefrontal syndrome are represented by the midline meningiomas of the falx cerebri, the infarctions following the occlusion of the anterior cerebral artery and of its branches, multiple sclerosis, the infections of the central nervous system, as well as the frontotemporal dementia¹⁰.

CONCLUSIONS

Nevertheless, the prefrontal cortex is the most distinctively "cognitive" and behavioural part of the brain.

The prefrontal cortex is the largest in humans, and it distinguishes our species from other primates.

In addition, the prefrontal cortex has regions for the emotional, and personality processes, as well as for pudency (sense of decency) and social cognition, thus empowering the individuals to know "how to behave".

By simply considering the large diversity of the connections of the prefrontal area, it is difficult to conceive that a lesion of any area, either single or in combination, should result in a clinical picture which we could consider to be unique for all the cases with an anatomically identical lesion⁴.

However, there are certain groups of symptoms which tend to occur together after the occurrence of a prefrontal lesion, and they differ depending on the location and the magnitude of the lesion⁴. The lesions located within the extended cortical or subcortical neural system might produce functional deficits which are similar to those which occur when the damage is isolated within a specific prefrontal region.

Therefore, the patients with lesions which involve regions of the basal ganglia or of the mediodorsal nucleus of the thalamus that are topographically interconnected with the dorsolateral prefrontal cortex might present with behavioural disorders that are essentially the same as those which occur in the patients with damage restricted to the dorsolateral prefrontal cortex.

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