

Mega cisterna magna (MCM) in a man with frotteurism symptoms – a case report

Michał Błachut¹, Paweł Dębski¹, Karina Badura-Brzoza¹,
Krzysztof Świerzy¹, Zbigniew Lew-Starowicz²

¹Department of Psychiatry in Tarnowskie Gory, Faculty of Medical Sciences in Zabrze,
Medical University of Silesia in Katowice

²Department of Medical Sexology and Psychotherapy, School of Medical Sciences,
Centre of Postgraduate Medical Education

Summary

Mega cisterna magna (MCM) is a brain development abnormality that occurs in 1% of radiographic images. It occurs when the transverse dimension of the cerebellospinal reservoir is greater than 10 mm. It is the most important reservoir in the cranial cavity. From the front, it is limited by the extended medulla, from the rear by the dura mater, and from the top by the cerebellum. Isolated anomalies in the structure of this brain region often do not cause any clinical symptoms. However, more and more attention is paid in research on the participation of the cerebellum in the regulation of cognitive and affective processes. These processes, in turn, may also be related to the regulation of sexual life.

The aim of the study is to present the psychosexual functioning of a man diagnosed with MCM, who is suspected of having committed five sexual offenses. The existence of such a structure of the CNS in conjunction with the analysis of the interview, data from the case files and the results of sexological, psychological and psychiatric examinations, made it possible to evaluate the limitation of the respondent's ability to direct his conduct during the alleged acts, while maintaining the ability to recognize their significance.

Key words: Mega cisterna magna, neurodevelopmental brain defects, sexual disorders

Introduction

The development of the nervous system is a complicated and long process that lasts from the first days of the fetal period to the second decade of life. Various factors, both endogenous (genetic defects, metabolic disorders) and exogenous (vitamin deficiencies, especially folic acid deficiency, viral infections) influence the emergence and disclosure of neurodevelopmental disorders. They usually develop in the first (cell

growth and migration phase) or second phase (cell connection phase) of fetal development. Nervous system defects are one of the main causes of miscarriages and deaths in early life and an important cause of pathology that manifests itself in infancy, early childhood, adolescents, and even adults.

Mega cisterna magna (MCM) is a developmental anomaly of the brain described in 1% of radiological images [1]. The appearance of the disorder is most often associated with infectious factors (fetal toxoplasmosis) or chromosomal aberrations (trisomy 18), it may accompany other neurodevelopmental defects, or be an isolated anomaly that does not cause any clinical disorders. The cerebellospinal reservoir is the largest and most important subarachnoid reservoir, located in the angle formed by the cerebellum and the medulla. It is located in the posterior fossa of the skull and is formed by the arachnoid tube passing from the medulla to the inferior surface of the cerebellum in its posterior part. The cerebellospinal reservoir is limited from the front by the medulla, from the back by the dura mater, from above by the cerebellum, and from below it connects with the arachnoid cavity of the spinal cord [2]. If its transverse dimension is greater than 10 mm – we are dealing with the MCM anomaly [1–3].

The cerebellum is traditionally known as the center of coordination and motor function. However, research increasingly focuses on its participation in the regulation of cognitive and affective processes [4–6]. It is suggested that the cerebellum communicates with many areas of the brain that influence cognition and behavior (such as the dorsolateral prefrontal cortex, the medial frontal cortex, anterior cingulate cortex, and the posterior hypothalamus, especially through the thalamus) and that there is transmission of noradrenergic, serotonergic and dopaminergic stimuli from the nuclei of the brainstem. It is believed that the cerebellum may play a role in regulating sensory, procedural, linguistic, and emotional functions through its connections to the limbic and cortical regions [7–11]. Changes in the neuronal transmission of the cerebellum towards the dopaminergic areas of the locus coeruleus, raphe nuclei and thalamus, caused by abnormalities and diseases, may lead to the formation of behavioral disorders. It is emphasized that any change in the structure of the cerebellum may cause recurrent depressive disorders with difficulties in impulse control [12–15].

Schmahmann [5, 16, 17] described the cerebellar cognitive-affective syndrome characterized by deficits in executive functions, language processing, spatial cognition, affect regulation, and behavioral disorders, these symptoms arise as a result of damage to the posterior part of the cerebellum, and their effect may be a reduction of general intellectual functions. Adults and children with these symptoms may experience problems with emotional control and display obsessive-compulsive tendencies. Cerebellar dysfunction is also observed in many developmental disorders, including autism, attention deficit hyperactivity disorder (ADHD) and developmental dyslexia, also damage to the cerebellum at an early stage of development may have a long-lasting effect on motor activities, cognitive functions and affective regulation [18]. It is postulated that even a less extensive change in the structure of the cerebellum, such as

mega cisterna magna, may be associated with the occurrence of psychotic disorders, and in some cases with treatment resistance or cognitive dysfunctions [7].

Affective and impulse control disorders, in turn, are related to the regulation of sex life. Various psychopathological symptoms (e.g., disturbances in attention, perception, thinking, emotional life) may become the causative factor of forbidden acts, also of a sexual nature.

Objective

The aim of the study is to present the case of a man diagnosed with MCM, who was suspected of having committed five sexual offenses.

Case report

A 23-year-old man was suspected of committing five prohibited acts of a sexual nature in the period from 2018 to 2020 (Article 197 § 2 of the Penal Code). The case files showed that the suspect, by using violence consisting in most cases of holding, tugging and shoving, led or attempted to lead women he met by chance into submitting to sexual activity against their will, by touching their breasts and perinea. The suspect was unable to rationally explain his behavior. "I wonder why I did it myself. On the one hand, I am very sorry for what I have done. Perhaps there is something stronger than me. It had nothing to do with the sexual sphere. I don't know why I was touching their crotches."

Autoanamnesis

The respondent was born into a full family, he has a younger sister. The father was a soldier, the mother has a vocational education – the respondent was not able to identify her learned profession. He remembers his childhood ambivalently, up to the age of 12 he was raised by both parents, he denied the existence of conflicts between them. The atmosphere in the family home was assessed as good by the respondent, the father was dominant, but the suspect confirmed the occurrence of father violence in childhood. Parents did not have parallel relationships. When he was 12, his father died of cancer, and his mother has had a new partner for some time. The respondent started education in primary school at the age of 7, did not repeat grades, but learned very poorly. From the 4th grade of primary school, due to the diagnosis of ADHD, he had individual classes for 3–4 years. He felt fairly well in the peer group, but tended to isolate himself from the group. After graduating from junior high school, he continued his education in a vocational school, he chose the profession – a plumber. After completing his education, he initially worked in the learned profession, and recently – as a quality controller. He denied the existence of relational problems at work with both co-workers and the employer. Due to his sight defect, he was disqualified from military service, he currently has a D category.

The subject is single and has no children. He denied the existence of serious injuries, accidents, loss of consciousness. He claims he is not taking any medications. He denied any hospitalizations. Nobody in the family received psychiatric treatment. The subject attended a psychologist. The reason for the first contact with the psychologist was, in his opinion, hyperactivity and behavioral disorders – at school he “instinctively” slapped an older girl on the buttocks. He confirmed the use of alcohol every 3–4 days, mainly consuming beer – on weekends, he did not use strong alcohol or drugs. He has never had a conflict with the law before.

Sexological examination

The suspect indicated that sexual maturation began for him at the age of 13–14. From the perspective of the respondent, the environment reacted to this process rather indifferently. His parents accepted his gender, they did not discuss sexual matters with him. The respondent denied having witnessed the sexual intercourse of his parents. He also denied having sexual contact with his parents or with anyone in the family. Nobody tried to commit any unwanted sexual activity towards him, he also had no contact with a pedophile or an exhibitionist. The suspect denied the occurrence of sexual games in childhood.

The source of sexual awareness for him were classes at school. At the age of 18, he began to masturbate, the mechanical activity itself dominated – during this period on average once or twice a week. He denied the use of any objects during the act of masturbation, water, mirror, and changing clothes. Fantasies about having sexual contact with a woman prevailed, sometimes thoughts of touching other women.

So far, he has not established a satisfactory partnership relationship, including a sexual relationship. The respondent accused his shyness and fear of contacts with women as the main cause of difficulties in establishing a relationship. He strongly denied any homosexual contacts or contacts with animals, with children, he denied the need to dress in clothes of the opposite sex.

The respondent described his sexual temperament as average. Sexual needs and thoughts of intercourse twice a day. He confirmed the daily occurrence of morning erections, and he described spontaneous erections during the day as rare, once a week. He watched pornographic films dominated by heterosexual sex twice a day. In pornography, as he emphasized, he was interested in getting to know something, curiosity dominated – he said that “he prefers to watch it on the Internet over than doing it to a random woman.” The respondent strongly denied thoughts about attempting rape of the woman. He also denied ever using the services of escort agencies. The respondent admitted that he has dreams of sexual content every 3 days, scenes of contact with a woman and vaginal sex dominate them.

When asked about his preferred sexual behavior and fantasies, he mentioned: masturbation, pornography, vaginal and anal sex. He definitely detached himself from the needs in terms of oral sex, group sex, sexual orgies, sex with the use of cameras,

partner exchange, sex with children or animals. He only achieved orgasm through masturbation. He admitted that he feels the fear of failing to prove himself in sexual contact with a woman. The respondent denied the use of sexual stimulants and drugs.

When asked about how he felt in the last 6 months, he said he felt bad. The mood swings that had been undergoing for 2 years, as well as the tension in situations when he liked a woman, intensified. His thoughts were then focused on the desire to touch the woman. He described it as a thought, as an impulse. He admitted to having a feeling of excitement upon touching these women. On the other hand, he did not think about sexual intercourse – he claimed that he would not like to, that he would be ashamed to have sex. Similar symptoms appeared in the subject already in primary school, and then in junior high school. He tried to control it. He experienced such impulses for the first time in the fifth grade of primary school, and he was unable to determine their cause.

As the respondent pointed out, touching was the most exciting for him – after doing this, he ran away. He described the excitement before touching, during planning to board buses, where he was searching for women. After making a choice, he followed the victim, touched her intimate parts and ran away.

Psychiatric examination

In the psychiatric examination, the following were scored: full orientation, clear awareness, calm and adjusted behavior, good, logical and consistent verbal contact, although the responses were clearly delayed and respondent had difficulties in word selection. The subject's mood was lowered, emotional tension and anxiety were noticeable. The psychomotor drive was balanced, the examined person did not express any delusions, he did not admit to experiencing hallucinations, he denied suicidal thoughts. Intellect in the clinical trial appeared to be lowered.

Psychological examination

A number of diagnostic methods were used in the psychological examination. The WAIS-R *Intelligence Scale* (PL), the EPQ-R (S) *Personality Inventory*, the IBZO-DSM-IV *Inventory for the Examination of Personality Disorders*, the *Watson Clock Drawing Test*, the *MOCA Montreal Cognitive Assessment Scale*, and experimental-clinical trials were used.

In the course of the psychological examination, the subject was fully aware of his own person, place and time. His general cognitive functioning, however, raised significant reservations. First of all, the suspect's reactions to stimuli (questions, tasks) were significantly deferred in time. The subject's visual and auditory perception appeared to be normal – his responses were logical, indicating that he correctly perceived the meaning of the stimuli. However, the information processing time was significantly extended. From the moment of question or task posed, the respondent's reaction often occurred even after a few minutes, even when the examiners repeated the questions.

There were problems with the choice of words and the efficient construction of statements. The respondent indicated, that the extended reaction time was related to memory difficulties. The content spoken by the subject was logical and grammatically correct, however, the subject experienced disturbances in train of thought – slowing down of its course. Fresh memory functioned without observable reservations. In terms of long-term memory, it could be noticed that the subject had access to memory resources, but the recall process was significantly extended. The subject's decision-making processes were weakened. He presented the problems, among others, within verbal fluency or abstraction processes at a level appropriate to age.

The conducted neuropsychological examination showed a decrease in the suspect's cognitive functioning, especially in terms of the train of thought. The cognitive impairment of the subject could be related to the so-called brain (organic) factor, which indicated the need for imaging diagnostics.

The assessment of intellectual functioning using the WAIS test confirmed the preliminary conclusions based on clinical observations. The results of the examined intellect placed him in the range of the borderline of intellectual functioning (borderline of norm and mental retardation: the general result of the intellect examination in the range 71–88 IQ). The subject presented an advantage of abilities related to the knowledge acquired in the course of education, upbringing and life experience, over wordless abilities that require efficient and logical information processing. The respondent showed a weakening of the abilities in the field of spatial imagination, mapping or coordination and organization of cognitive material. He was also less able to cope with the speed of perception, learning and concentration. The accused achieved better results in tasks related to the presentation of acquired knowledge or using fresh memory.

The suspect was diagnosed with the features of a personality disorder. He assessed his childhood ambivalently. He strongly experienced his father's death at the age of 12. He assessed his childhood behavior as "rude." The situations described by the examined person showed that he needed stimulation and sensations. The respondent described that, for example, he ran away from home, jumped through gates, or climbed trees, for no reason, on impulse. As a little boy, he also strangled a cat. As an adult, he was seen as a person leading a rather solitary lifestyle, and his social contacts were limited to family relationships and contacts at work. So far he has not established any intimate relationship. The study of the subject's personality showed that he can be characterized by strong introversion, i.e., a tendency characterized by a limited need for social contacts for the benefit of his own inner mental life. He is also characterized by a high level of neuroticism, i.e., a tendency to experience negative emotions, which is also associated with a poor ability to cope with stress and frustration.

The study of the personality of the respondent showed mixed disturbances in its structure (dissocial, schizotypal, emotional lability, avoiding, and dependent features). The opinionated person presented the features of a person who avoided direct

confrontation with other people in order to protect his self-esteem, with difficulties in dealing with criticism. His emotional states and behaviors could have been unstable, as well as bizarre or maladjusted. He presented difficulties with creating interpersonal relationships based on closeness. The results of the study suggested that the respondent had assimilated the basic rules of social coexistence, but he had difficulties with their application. The analysis of the respondent's statements made during the research also shows that he presented difficulties with understanding of the impact of his actions on other people and on their mental functioning (weakened empathic abilities). The description of the subject's childhood indicates, that he needed stimulation, including strong, non-standard experiences (cat strangulation). As an adult, the subject undertook actions on impulse, unable to cognitively (mentally) develop and inhibit his impulsive actions. The described features, present in the lifeline of the respondent, therefore lead to the diagnosis of incorrect personality development of a mixed type.

Summing up, in the psychological functioning of the subject, first of all, attention should be paid to his reduced intellectual abilities, which were on the borderline between the norm and impairment. The subject's cognitive abilities were impaired – especially in the train of thought. The results of the research and observations of the suspect suggested the occurrence of abnormalities within the CNS. This creates a situation of disproportion between the possible pressure of impulses and the ability to develop and regulate them with the use of cognitive functions. As a result, the patient engages in direct drive behavior – in the form of an impulse discharge not mediated by reflection. In addition, the lack of adequate support for the specific characteristics of the patient manifested in the early stages of his development, including therapeutic rehabilitation, contributed to the consolidation of the inadequate way of functioning and shaping the features of mixed personality disorders. Taking into account all the information, it was decided to perform CNS imaging.

Neuroimaging

Computed tomography of the head was performed. The presence of fluid space between the cerebellar hemispheres with size of 18 x 14mm – mega cisterna magna, was demonstrated. Apart from that, the brain tissue was of normal densities, without focal changes. The central structures were not displaced. Asymmetric ventricular system, left brain ventricle larger than right brain ventricle, otherwise system not dilated. Properly configured basal basins. The conclusions include: a developmental anomaly in the form of mega cisterna magna. Asymmetry in the area of the lateral ventricles of the brain.

Discussion

In the described case, the subject was accused of causing 4 women aged 16 to 49 years to undergo “other sexual activity”, in the time period from 2018 to 2020, by touching their perineum, buttocks and breasts through clothes, and an attempt to force

a woman in her 20s to “other sexual activity” by tipping her over and grabbing her chest and arms. The conducted research and analysis of documentation showed that the psychosexual development of the respondent was disturbed by a number of factors related to the respondent himself (MCM, difficulties with learning and impulsive behavior) and the environment in which he functioned (father’s violence, his death during the patient’s adolescence, insufficient educational and therapeutic activities corresponding to the specific developmental needs of the patient). At the age of 12, there was a significant change in his family. In an interview, he admitted that he had problems with hyperactivity since childhood, he had been psychologically diagnosed several times with the decision to change the conditions of exams at school. Impulsive behaviors were present in the subject from the early school period. The conducted medical and psychological tests showed the existence of mental and psychosexual development disorders in the form of psychosexual immaturity, socialization disorders, preferring solitude, and the existence of anxiety symptoms. The research results indicate the existence of mixed personality disorders coexisting with low intellectual level and symptoms of cognitive disorders.

Psychosexual immaturity is a developmental disorder, which is characterized by an inability to properly fulfill the sexual role. There is an advantage of emotional over rational behavior and a preference of sexual behaviors typical for adolescence. The literature indicates that psychosexual immaturity can be inferred if a person is characterized by: no developed sexual identity or inability to formulate an adequate sexual response or inability to establish dyadic relationships [19–22]. Mature sexual expression arises, e.g., in the context of mental development and its achievements, such as: internalization of norms and accepting the norm as an autonomous value. Sexual maturity is manifested as the ability to recognize sexual need, distinguish it from other experiences, postpone the discharge of sexual tension and to combine the elements of tenderness, excitement, desire in experiencing one’s sexuality and implement them in a sexual relationship with the same person, as well as the ability to strive to improve the quality of relationships. It is also related to the ability to withdraw from a relationship, which ceases to be satisfactory for the individual and which begins to lower the general well-being and quality of life. Sexual maturity also manifests in subordinating sexual expression to social norms, as well as to the inner values of an individual [19, 21]. The patient was found to have an intellectual level on the border of norm, problems with controlling impulses, sexual needs and postponing the release of sexual tension, fear of women, lack of experience and dyadic relationships, also masturbation and paraphilic disorders were the dominant, if not the only forms of satisfying the sexual drive. The study showed the existence of perennial sexual interests related to touching unknown women.

The basic tool for agreed nosological diagnoses in Poland is the International Classification of Disorders ICD-10. According to its principles, sexual preference disorder in the form of frotteurism should be diagnosed if the following criteria are found during the tests:

1. The examined person experiences increased sexual desire and fantasies regarding contacts by touching and rubbing against other people for sexual arousal. Recurrent, intense, arousing sexual fantasies, desires, behaviors involving touching or rubbing against another person without their consent.
2. A person acts on the urges or is markedly distressed by them.
3. The preference disorder has occurred for at least 6 months [23].

In DSM-5, paraphilias are defined as any strong and persistent sexual interest other than copulation or foreplay prior to copulation with a phenotypically normal, consenting, adult partner [24].

The causes of frotteurism include various types of sexual inhibition and difficulties in establishing relationships with women, most of frotterists are young men, feeling fear of women, having no sexual experience with women, similarly to the examined 23-year-old man [25]. In the discussed case, we can speak about a person with symptoms of psychosexual immaturity, fixated on the same stimuli and types of sexual behavior.

The symptoms revealed by the examined person in various spheres of psychosexual functioning seem to be an example of the interaction of organic factors (CNS anomalies) and deficits in the family and educational environment. The causes of the symptoms presented by the suspect are therefore most likely related to the disturbances in the functioning of the CNS, but further deepening and shaping of their final image may be environmental, due to negligence in family and school. Disturbances in the area of cognitive processes were observed in the examined person from childhood – extended reaction time, impaired functioning in working memory, learning difficulties. These symptoms became the reason for establishing special, though not fully adequate for the person, educational requirements in the form of extended time for performing school tasks. It seems likely that the cognitive disturbances in the suspect's childhood were the basis of his early impulsive behavior. The slowdown in the process of information processing, difficulties with cognitive control (disturbance of the attention function) or a reduction in intellectual performance contributed to drive, impulsive and affect behaviors. Poor cognitive control tilts the scales of psychological decision-making regarding behavior from cognitive functions towards emotional-drive functions. This is also how impulsive behaviors were observed in childhood. The examined person recalls that for reasons unknown to him and his relatives, he undertook activities under the influence of impulse – he jumped through gates unexpectedly, climbed into various dangerous places, and even strangled the cat (weakening cognitive control could lead to the free fulfillment of the needs in terms of seeking emotional stimulation). Despite the disclosure of cognitive and behavioral disorders in the suspect's childhood, no further steps were taken in terms of their in-depth diagnosis or treatment attempt. The subject grew up in a rural environment where access to treatment and knowledge of the need for specialist support may have been limited. This environment was also conducive to the social isolation of the person who had difficulty establishing relationships. It is also not without sig-

nificance that the examined person lost his father early, and as the interview shows, no other important man appeared in his life, who could be a model of socialization for him. The testimony of the respondent also shows that his mother did not set any boundaries for him, focusing more on fulfilling caring rather than educational tasks. In the family of the person there was also weakened communication between its members, therefore many matters were not explained or disclosed. After childhood, which was dominated by unrelated drive behaviors focused on seeking stimulation, in adolescence they were replaced by behaviors related to dynamically developing sexuality, natural for this age. Impulsive fulfillment of the need for stimulation – in childhood, multidirectional and undefined, began to be implemented as part of sexual behavior. In this period, therefore, the future pattern of satisfying sexual needs outside the relational context of the respondent began to take shape.

The tendency to act motivated by drive, in combination with the abnormal personality traits and psychosexual immaturity developing in the person (tendency to isolation, inability to establish relationships, excessive timidity, tendency to compulsively regulate tension (masturbation), lack of confidence in one's masculinity and fear of not meeting women's expectations) were revealed in the form of impulsive touching (patting) female friends and withdrawing immediately. In adulthood, the pattern of this behavior took the form of impulse fulfillment of sexual needs, within the framework of the characteristics of a disturbed personality – the examined person attacked unknown women, however, he was afraid of contact other than a touch, and immediately withdrew after the action. The combination of cognitive disorders, abnormal personality traits and the developing sexuality led to the development of the described, disturbed pattern of fulfilling sexual needs. Repeating the same behaviors (spanking friends at school, later women) could lead to fixation on the same stimuli and types of sexual behavior in the discussed case.

An important element in the description of this case is the anomaly in the structure of the central nervous system of the examined person. In the performed imaging examination of the head – computed tomography of the brain, a developmental anomaly in the form of an 18x14millimeters expansion of the fluid space between the cerebellar hemispheres (mega cisterna magna) and the asymmetry of the lateral ventricles of the brain – were described. Such a structure of the CNS, combined with the analysis of the interview, data from the criminal case files and the results of sexological, psychiatric and psychological tests, suggest the connections with the existing disorders. It was found that the identified anomaly could affect the respondent's ability to direct his proceedings.

The existence of a relationship between abnormalities in the structure of the cerebellum and brain, and impulse control disorders, behavioral disorders and cognitive disorders (occurring from childhood) is repeatedly confirmed in the literature by other researchers [7–11]. Nevertheless, the influence of psychological and environmental factors on the development of the respondent and the course of his behavior cannot be ignored.

No scientific reports were found on the direct relationship between mega cisterna magna and disorders of sexual preferences. In the context of the case under discussion, the influence of the aforementioned several groups of factors on the emergence, development and course of sexual functioning in the described man should be taken into account.

In the context of jurisprudence, it is also necessary to take into account the limited ability of the person to direct his proceedings during the alleged acts, while maintaining the ability to recognize their meaning.

The results of the conducted research, including the use of the STATIC-99 tool, allowed for the confirmation of the existence of a moderate to high probability of the suspect committing a repeated offense related to the disturbance of his sexual preferences. STATIC-99 is a tool designed to assess the risk of sexual recidivism related to violence, referred to adult men who have been convicted or have been accused of at least one sexual offense committed to the detriment of a child or an adult who refuses to have sexual contact [26].

In the psychiatric-forensic opinion on the case in question, it was recommended to use precautionary measures in the form of psychiatric, psychological and sexological treatment on an outpatient basis in a mental health clinic and sexology clinic.

Recapitulation

The participation of the cerebellum in the regulation of cognitive and affective processes still remains in the sphere of scientific research. Knowledge on this subject is very important in the assessment of symptoms in the field of control of emotional and sexual processes as well as the existence of sexual preference disorders.

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Address: Paweł Dębski
Department of Psychiatry
Faculty of Medical Sciences in Zabrze
Medical University of Silesia in Katowice
42-612 Tarnowskie Góry, Pyskowicka Street 49
e-mail: pdebski@sum.edu.pl