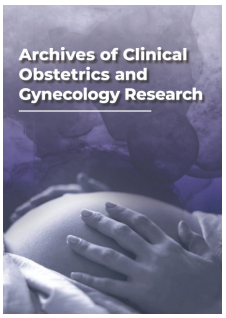
Archives of Clinical Obstetrics and Gynecology Research

Case report



Female Fetus Sexual Behavior and Maternal Introspection During Sonographic Observation: Case Report

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Abstract

The case report describes the observation of spontaneous genital self-stimulation by a female fetus during a routine third-trimester ultrasound. The fetus exhibited focused, rhythmic movements involving the clitoral area, accompanied by pelvic and full-body contractions resembling an orgasmic response. The episode, lasting approximately 20 minutes, was interpreted intuitively by the mother, without clinical prompting. This unexpected observation, combined with the sonographer's empathetic communication, triggered a deep process of maternal introspection.

The experience prompted the woman to reflect on her own sexual development, education, and relational patterns. She later described this moment as a turning point, leading to significant life changes: ending an unfulfilling marriage, experiencing orgasm for the first time, forming a healthy new partnership, and encouraging her daughter's autonomy in emotional and sexual development.

The case highlights the psychodynamic potential of routine obstetric ultrasound, which can evoke profound emotional insight and influence parental identity. The report also raises broader questions about fetal behavior, the early emergence of sexual response, and the shaping of sexual identity through sociocultural and familial norms. Observing the fetus as a separate and active subject invites healthcare providers to consider the emotional and ethical dimensions of prenatal care. Encouraging reflective, supportive environments during ultrasound may foster empathy, autonomy, and more inclusive approaches to sexuality and parenting.

Introduction

Prenatal ultrasound examinations are typically anticipated as joyful moments for expectant parents, providing reassurance about their baby's well-being and helping alleviate pregnancy-related anxiety and distress associated with somatic complaints and complications during childbirth [1]. The mother-child relationship begins during pregnancy, and the bonding process can be strengthened through evarious experiences, including observing fetal movements during ultrasound examinations [1]. Fetal exploratory and spontaneous movements are indicators of health and development. Healthcare providers typically help patients interpret ultrasound images, providing explanations and answering any parents' questions, which further contribute to their emotional experience and attachment [1]. Few rare publications reported fetal masturbatory sexual activity [2-4].

Nevertheless, numerous ultrasound observations of fetal behavior, including genital exploration, have been documented over the last decades [5]. They challenge the notion that fetal movements are solely reflex activities without significance, suggesting they may carry experiential meaning and purpose [5-7]. Biological sex can affect various aspects of prenatal development and influence the expression of certain behaviors and neural processes; human sexuality has neural, anatomical, and physiological correlates [6,8]. Neurobiologically, sexuality is associated with specific brain regions developing during prenatal life: their neural pathways are involved in processing sexual information and the experience of sexual arousal [8,9]. Sexuality matures and grows throughout postnatal life, involving biological, psychological, social, and cultural aspects [8].

Research has attempted to describe and define the evolution of fetal movements, often adopting a classification system based on the terminology used for premature babies and newborns [5-7]. Premature babies are foetuses in the wrong place at the wrong time and have

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shown impressive resilience and adaptability. They challenge previous assumptions about their capabilities and experiences, demonstrating the potential for meaningful interactions, emotional responses, and communication even in their vulnerable state [6,7]. The "ethograms" or movement patterns are associated with the maturation of corresponding neural correlates within the central nervous system [5]. In other words, the specific movements observed during the distinct stages of prenatal development are thought to reflect the progression and maturity of neural functions. The term "ethogram" derives from "ethics" and suggests that researchers recognize the significance and potential implications for fetal development and experiences: the fetus is not merely a needy being and a passive recipient of external stimuli; the unborn actively engages with itself and the parental environment, forming early connections and experiences with independent individuality (as a newborn) which lay the foundations for the future development [5-7,10,11]. Direct visualization of the infant and child's behavior has already led to profound changes in the thinking and attitude of health workers; the same will be valid for fetuses [6,8,9]. Parents having real-time visualization of their unborn baby, even mediated by a screen or ultrasound, can develop an intense bond before birth [1,9,10]. The emotional impact of ultrasound is determined by maternal psychodynamics and is strongly influenced by the level and quality of the information provided during the exam [1]. The visual experience induces parents to consider their children as separate individuals, generating a specific emotional response [10]. It activates the empathic relationship, which refers to the experience one has while observing another. The ultrasound operator's interpretation and perspective become an integral part of the pregnant woman's experience, influencing the empathic process with the child [1,5,10].

Much of the evolution of our physiological processes remains largely unexplored. Sexuality is present even during early infancy, playing a crucial role in character formation and defining the individual's identity, which is shaped by the social environment, parental nurture, ethics, and integrity [11]. Sexual, relational, and ethical development are intertwined, as individuals' understanding and expression of their sexuality can be strongly influenced or inhibited by parental values and social beliefs [11,12]. A complex interplay exists between inhibitory processes (such as restraining, canceling, and suppressing) and excitatory mechanisms (including initiating, executing, and promoting) that modulate sexuality [12]. This interaction shapes the expression of sexual thoughts (cognitive aspects), desires (motivational states), and behaviors. Effective inhibition of sexual expressions is a natural and adaptive response to contextual factors, facilitating the regulation of sexual behavior and preventing undesirable consequences both for individuals and society [12]. Prosocial development refers to the acquisition of ethical values and behaviors that promote the well-being of individuals, others, and society. As with the development of sexuality, it involves cognitive, neurological, physiological, emotional, and empathic growth from childhood to adulthood [6,8,11]. As proposed by Lawrence Kohlberg, the stages of prosocial moral development describe a series of reasoning levels individuals may progress through as their understanding and awareness widen. These levels range from focusing on self-interest and avoiding punishment to a concern for universal ethical principles and the ability to encourage the emergence and expression of each individual's originality [13]. Sexual equality is a prosocial attitude that educates individuals about healthy and consensual relationships and fosters an inclusive environment where diverse sexual identities and experiences are respected.

The case report describes how, during a routine obstetric ultrasound examination, the pregnant woman suddenly became a spectator of her child's unexpected sexual behavior. This surprise triggered a deep self-reflection and awakening, prompting the woman to remember and reexamine her sexual education, relationships, and life choices. Observing her child's behavior allowed the woman to reflect on her current relationship and sparked an awareness that led to significant life changes over time. This report details the observation of fetal behavior as it unfolds, along with the recorded dialogue between the patient and sonographer, completing and concluding our previous brief communication [3].

Case report

A 29-year-old woman in her first pregnancy underwent a scheduled routine ultrasound examination of the third trimester on 27th July 1994, at 32 weeks' gestation. The patient was programmed for an at-term cesarean section. She had experienced multiple myomectomies at the age of 28, but during pregnancy, the uterus did not show any contractions. According to the obstetric clinical record, the first and second trimester clinical and ultrasound examinations were completed, revealing no abnormalities. The patient complained of anemia and extrasystoles since 30 weeks gestation, controlled by iron supplementation and a beta-blocker. At 25 years old, she started to suffer from anxiety and had been on psychotherapy and psychiatric medication, which she had stopped before pregnancy.

A psychologist-gynecologist involved in sexual health (GG) was a neutral recording observer; a gynecologist trained in prenatal diagnosis (MS) was the sonographer interacting with the patient. They were involved in studying fetal behavior and parents' experience of childbirth and early life at the University of Genova, Obstetrics Department of "S. Paolo" Hospital, Savona, Italy. The apparatus used was a sonographic RT2800 device from General Electric (General Electric Medical System, Milwaukee, Wisconsin, USA), equipped with a 3.5 MHz convex probe and a Polaroid instant printer, but without a video-recording kit. The patient gave her informed consent for the clinical procedure. After evaluating the fetal growth parameters, the sonographic examination continued with the observation of real-time spontaneous fetal movements as part of the fetal well-being evaluation. The fetus was cephalad in a longitudinal position with the spine on the uterus's posterior and right lateral aspects. The lower limbs were abducted and flexed on the abdomen.

Ultrasound image: pelvic region, in which the vulva is clear and visible by the mother.

Woman: "Can you tell the sex of my baby?"

Gynecologist (MS): "From this angle, we should be able to see the baby's sex."

Woman: (excited) "So, it's a girl?"

Gynecologist: "Yes, it certainly looks that way! You can see the vulva right here; it's quite clear."

Ultrasound image: a hand appears on the screen and, with slow, exploratory movements, moves around the genitals and makes contact.

Woman: "But what is she doing?"

Gynecologist: "She is touching her genitals."

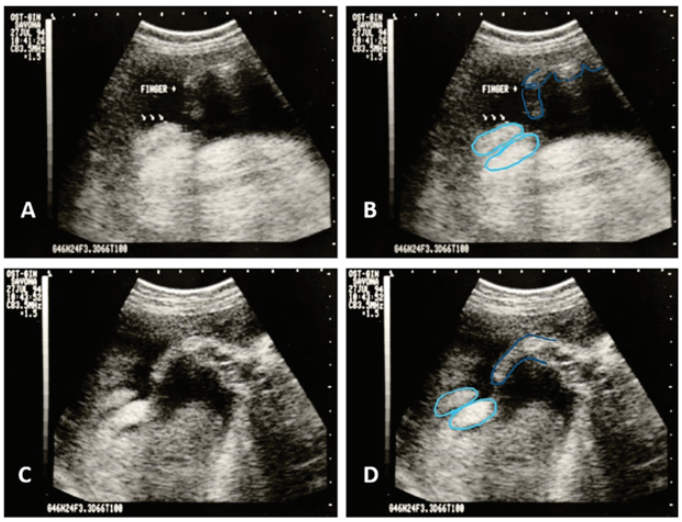

Figure 1: *Female fetal finger approaching her genitals. A, C: Polaroid photographs of the sonographic screen. The vulva and fingers are shown in the oblique parasagittal plane. B, D: the vulva and finger are highlighted in color for easy viewing. Light blue: vulva. Blue: finger. The three little arrows in Figures A and B show the right labrum major.*

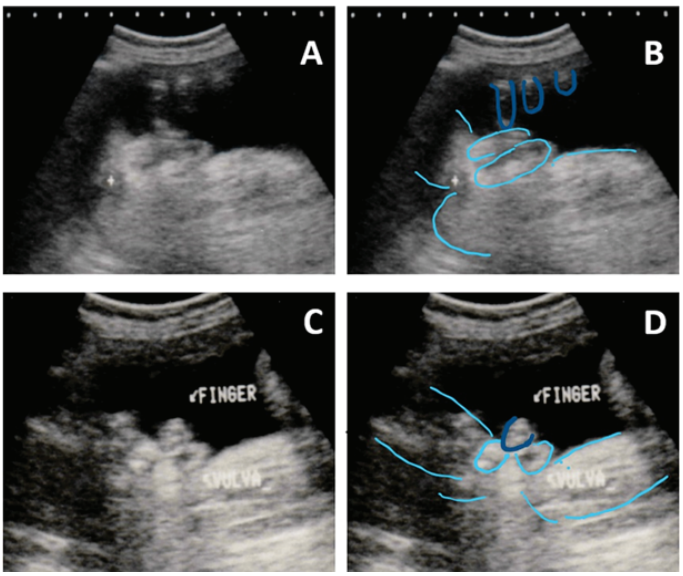

Figure 2: *Fetus touching the vulva and clitoris. A, C: Polaroid photographs were taken during the fetal back-and-forth movement of the fingers over the vulva (A) and clitoris (C). B, D: The vulva, thighs, and finger are colored for ease of viewing. Light blue: vulva and thighs. Blue: finger.*

The woman loses her smile, and she seems surprised.

Gynecologist: "At 32-34 weeks of gestation, fetal development is almost complete; fetal behavior is now similar to that of a newborn."

Ultrasound image: The movements become very precise, and the fingers touch the vulva with slow, rhythmic flexor-extensor movements for 15-20 seconds and then retire.

Woman: "She is still at it! It is a bit embarrassing."

Ultrasound image: The fingers' movements concentrate on the anterior part of the labia majora (Figure 1A, 1B).

Woman: "I didn't think they could do that kind of thing at this age …."

Gynecologist: "She is exploring her body."

Ultrasound: the flexor-extensor movements of the finger continue, pausing now and then.

Gynecologist: "She is trying to repeat something that seems to give her pleasure." Mother: "She seems to be enjoying herself! What a little naughty slut!"

Ultrasound image: the index or middle finger's slow, repetitive movements alternate with brief pauses and are now concentrated around the clitoris (Figure 1C, 1D).

Woman: "I was not expecting anything like this! …"

Gynecologist: "The child is fine!". "The quality of movement is an indirect indication that the baby is in good health … Do you want us to stop now?"

There is no code of conduct in such a situation. The gynecologist looks at the psychologist and brings the woman back to the professional "contract," which leads to evaluating the fetus's physical health.

The patient continues to watch the monitor and does not answer.

Ultrasound image: the finger alternates between large, energetic, and weaker movements (Figure 2A, 2B).

Woman: "She is more with it than me! We have never so much as talked about sex in our house! My parents would be horrified at this, especially my father!"

Gynecologist: "Sometimes parents find their children's sexuality embarrassing. It is tough for a father with a daughter."

Ultrasound: the movements continue, increasing in rapidity.

Woman: "I have always been inhibited about things like that. I married my first boyfriend and have never been with anyone else; however, if she is like this at her age! It looks as if it will be different for her."

Gynecologist: "Does that worry you?"

Woman: "My parents were too strict with me! Maybe it would have been better for me to have more experience before I married! However, I do not know how I would react to having an overly lively daughter."

Ultrasound image: the pelvic region began to move to and fro, and the movements are accompanied by an intensification of the finger movements' rhythm (Figure 2C, 2D).

The woman 's agitation increases: her eyes move from the screen to the gynecologist and back again, eventually settling on the screen, where they remain. Her face is flushed, and her eyes are shiny.

Gynecologist: "She seems to be masturbating with great conviction…."

Ultrasound image: the pelvis stiffens, followed by sharp, oscillatory movements that spread to the torso.

Woman: "What! … My daughter is a pervert!"

Ultrasound image: the oscillatory movements ceased. The torso and pelvis relaxed. The fingers' movements slowed, and the hand moved away from the genitals and disappeared from the screen.

Woman: "It is just as well that she will be more sexually liberated than me … Like my sister, who now has many boyfriends. My father used to get angry. She would come home

late at night! Go on holiday together with them! All things that I had never even dreamt of doing. Now they accept her the way she is, and maybe they even love her more than me! Moreover, they are careful not to criticize her because they know she will not stand for it."

The patient shared her personal and familiar history more deeply during the clinical interview following the sonographic exam. In summary, the patient said her father had a protective behavior dictated by anxiety and fear for his daughters. In contrast, the very religious mother had never talked to her about sexuality. She admitted she had suffered from anxious depression and panic attacks during adolescence; her father had taken her to a psychiatrist, his friend, for pharmacological treatment. She decided autonomously to enter psychotherapy at 25, against her father's will. The patient's husband was described as authoritarian, like her father, and was the only man she had ever known. The patient felt that the sexual inhibition had caused a more general submission in her life's choices to her parents' expectations to escape their criticism. She seems to be sure that her parents' educational intervention on sexuality had determined some conditioning in her existential choices. According to her memory, sexuality, and relationships were inhibited by an authoritarian father and an absent mother, who had not granted her the right to autonomy and exploration. She admits not having a satisfying sexual life with her husband.

The patient expressed concerns and decided not to consent to the publication of the complete observation and dialogue. The patient's father was a doctor and a medical manager of the hospital. It raised valid concerns about potential access to sensitive information, including the case report. The patient's initial decision not to consent to publication was a reasonable precaution to safeguard her privacy and prevent any unintended disclosure of her medical information. After almost three decades, her father's passing removed this concern, allowing her to reconsider and ultimately agree to the publication of the original recorded dialog by providing current information about herself and her daughter. The clinical patient interviews were archived in a public repository file [14] and helped direct and coordinate the report's themes. They were performed after the ultrasound observation (1994), one year later (1995), and before giving definitive informed consent for publication of the case report (2023). The daughter declined the invitation for a clinical interview with the authors.

Discussion

The case report involves a pregnant woman witnessing her female unborn child engaging in genital exploration during a third-trimester routine ultrasound examination. The fetal behavior observation, unique in literature and cited in articles and books, showed that the movements were predominantly focused on the clitoral region [3]. The movements ceased after approximately 30 seconds and resumed after a brief

***Table 1**: Description of Kohlberg's stages of prosocial development.*

Levels of Prosocial Morality	Stages	What is right to do	Social perspective
Level 1 Pre-Conventional Morality.	**Stage 1:** Obedience and reward-punishment orientation.	Avoid breaking the rules involving punishment. Obey if it brings an advantage.	Egocentrism: the point of view of others is not considered. The perspective of authority is confused with one's own.
	Stage 2: Self-interest and instrumental-relativist orientation.	Satisfy one's needs and pursue one's interests. Let others do the same and establish relationships based on mutual exchange and reciprocity.	Concrete individualism: the awareness that one's interest can conflict with that of others.
Level 2 Conventional Morality.	**Stage 3:** Conformity, interpersonal accord. Nice Guy Orientation.	Conform to the expectations of the social group: family, friends, and community. "Do not do to others what you would not want them to do to you."	Community: Community interests take precedence over individual interests. The community expects trust, loyalty, respect, and gratitude.
	Stage 4: social system and conscience. Authority and law and order orientation.	Respect commitments and laws by contributing to society, the group, and the institution.	Sociality refers to the system that defines rules and roles. Relationships between individuals are determined by their roles within the social system.
Level 3 Post-Conventional Morality.	**Stage 5:** social contract orientation, individual rights, and consensus of a thoughtful human being.	Respect for the rules, values, and opinions of the society in which one lives, knowing that they are based on a contract between individuals. Some matters cannot be questioned.	Priority over society: the rational individual knows that rights and values precede social agreements. All perspectives must be integrated to achieve the best possible model of society.
	Stage 6: Universal Ethical Principles.	Believe in universal ethical principles of justice: equal rights and respect for human dignity. Behave following them.	Moral: the rational individual believes that there are ethical principles to which social systems must be inspired. Each individual is an end in themselves, not a means to an end.

Table adapted from Bacchini, D. (2011).

interval. Subsequently, gentle tactile stimulation was repeated, accompanied by short, rapid pelvic and lower limb motions. Following another pause, the fetus exhibited muscle contractions involving the trunk and limbs, which evolved into clonic-tonic movements encompassing the entire body, as in orgasm. The woman recognized the type and quality of the movements observed spontaneously, without explanation. The episode concluded with a phase of rest. The whole sequence was monitored continuously for approximately 20 minutes [3]. The observation of the spontaneous, unexpected fetal sexual behavior, mediated by the dialogue with the sonographer, elicited the woman's insight into her psychosexual education. During the clinical interview in 2023, she reported that it had sparked a profound change in her sexual, affective, and relationship life, which occurred over time.

Observing the unborn child's behavior triggered memories from her youth and those related to her sister's opposite behavior. The noted conflict within the woman between the introjected parental norms on female sexuality and the actual/present empathetic understanding further underscores the complexity of her feelings and the internal struggle to reconcile different perspectives. By watching her daughter, she seemed to have recognized the behavior of her sister, free from parental inhibition on sex, which she had not allowed herself. She became more compassionate, considering her daughter's autonomy and potential life experiences, laying the foundation for future changes as a woman and parent. The woman's reactions and emotions at various stages of the observation reflected her background education, experiences, and attitudes toward female sexuality. They might stem from her upbringing and judgment standards about sex behavior focused on obedience to paternal authority and rules, with controversial feelings regarding her child: they appeared in her words to have influenced perceptions and attitudes toward sexuality [10,13].

The inner experience evolved as the ultrasound observation progressed, indicating a qualitative leap in her understanding and acceptance of the situation. The patient started to reflect on her own experiences, considering the emotional absence of her mother as a lack of a female role model in the realm of sexuality. This introspection freed her from the constraints of conflicting feelings and parental/societal norms about female sexuality, allowing her to focus on her own experience. In the latter part of the observation, the emotional response and reflections revealed a dynamic internal process of personal self-awareness: she grappled with her reactions and perceptions of her daughter's behavior [10]. The gynecologist's reminder of the professional contract and assurance of the child's well-being brought the woman back to the present moment. It allowed her to relax and permit more to emerge: the woman showed the ability to imagine her daughter's potential different future sexual experiences, focusing on empathy and considering the perspectives of others: it might signify transitioning from earlier judgment to a more balanced and prosocial perspective [13].

Throughout the sonographic observation, she underwent a profound and enriching emotional journey, grappling with her own experiences and conditioning while recognizing her child as a distinct individual with the potential for autonomous choices. Through the dialogue with the sonographer, the woman's internal conflict between her parents' potential reaction and her growing empathic understanding of her daughter's behavior emerged. The case report depicts an intimate, rich, and complex process of self-reflection and prosocial development. In a few minutes, the woman moved from raw obedience to the paternal rules to prosocial respect for an individual's personal choices, highlighting the transformative power of maternal empathy in observing the fetus as a separate human being (Table 1) [10,13]. Over the long time that has passed, the woman reported that she often recalled that day in 1994, making it possible for her to consider that observation as one of her life's principals (if not the main) turning points.

The case report opens to considerations of distinct, separate, but interdependent thematic areas: the emotional impact of ultrasound observation, the development of sexual behavior, the orgasmic function, and some ethical issues on sex education. Each issue raises important questions for further exploration and research.

The emotional impact of ultrasound

Ultrasound real-time imaging has positively affected maternal-fetal attachment and maternal anxiety reduction, allowing the maternal insight process [1]. Sonographic technologies enable expectant parents to establish an empathetic relationship with the unborn child, helping them see behavioral indicators that could be interpreted as expressions of fetal emotions [1,10]. Parents can often identify fetal anatomical structures and recognize spontaneous movements, thus appreciating the fetus's exploratory behaviors directed toward its body and the intrauterine environment. High-quality interactive ultrasound examinations can create a visual and emotional experience for pregnant women, fostering a sense of connection and affection toward the fetus and possibly facing/coping with personal beliefs, preconceptions, and values [1]. This process helps expectant parents to recognize the fetus as a separate and distinct individual from the mother [1,9,10]. Empathy is crucial in this process, allowing parents to develop a caring and compassionate attitude toward the fetus, and it has implications for education, altruism, and ethical decision-making [9,10,15]. During the brief ultrasound examination, the woman's mirror neurons were activated, and she developed empathy for the child, leading to a greater awareness of her past and present emotional, familial, and relational situations [13]. She seems to have recognized her stage of development in gender identity and social personality through her child's unexpected and unique sexual behavior [9,11,13,15]. A subsequent attempt to observe this fetal behavior again near term with an ultrasound machine equipped with video recording was unsuccessful. The sonographer's role was essential in this process, as his communication and relational skills bridged the gap between the uterus's internal world and the woman's mental world. Through ultrasound examinations, parents whose prenatal experiences are unconscious can witness the materiality of the fetus and form specific imaginative representations, further deepening their emotional bond [1,10].

The development of sexual behavior

Prenatal life has been shown to influence future human development, including individual health and behavior [9,10]. The fetus can learn from internal and external stimuli, and its capacity to retain information grows over time in line with the development of the central nervous system [6]. The fetus actively participates in its development and environment rather than passively receiving stimuli. Research indicates that the fetus exhibits proactive sensory and motor activities in the womb, which contribute to its overall development [5,6,10]

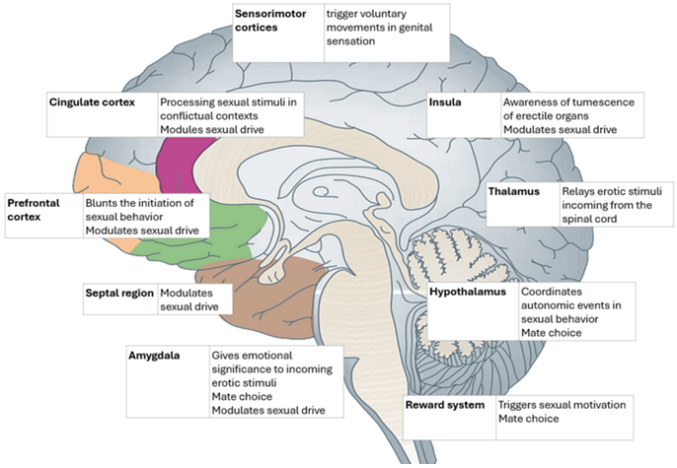

Figure 3. *Brain areas involved in human sexual behavior. The figure summarizes the brain areas related to sexual function (Calabrò et al., 2019). Moreover, the spinal cord plays a crucial role in clitoral/penile tumescence, lubrication of the vaginal/penile glands, and the rhythmic contraction of perineal muscles. Brainstem regions, such as the nucleus paragigantocellularis, locus coeruleus, raphe nuclei, and the periaqueductal gray area, are closely linked to the spinal cord and regulate tumescence and orgasm.*

Early behaviors lay the foundation for future complete and mature functions: research affirms that a subtle link between behavioral and psychological continuity extends from the fetus to the newborn and from the newborn to the child [9]. Fetal behavior literature has noted that both male and female fetuses exhibit sexual behaviors during prenatal life. Some researchers have suggested that early behaviors may be evidence of an adaptive genetic or epigenetic trait related to sexual response and behavior in females [2-4,6,15-17]. The genital area sends out sensations of pleasure. Pleasure and pain are essential experiences through which humans learn to function effectively for survival. These experiences lay the groundwork for both genetically determined and acquired behaviors that shape the individual's responses and strategies in life [12,16]. Human neurobehavioral development is a dynamic process characterized by "differential continuity," which means that changes occur while certain underlying maturational constructs remain constant. As the individual grows, external manifestations may change, but the core aspects of their neurobehavioral development remain consistent [6,12,16,18].

As a physiologic, metabolic, relational, and social function, sexuality involves different areas of the central nervous system (Figure 3) [8]. The case shows that the female sexual pleasure response appears complete in its sensory and motor neural pathways and autonomic reflexes, parasympathetic (arousal) and sympathetic (pleasure body response). The described observation also suggests the possible presence of a bare intention to follow and reiterate with movement the perception of a precise sensation. It seems likely that this is the case, particularly in the early stages of development, not only during the first months of life but also during fetal life [5,6,9,16-18]. The complete physiological function of orgasm also involves the maturation of hormonal correlates, the synchronization of rhythmic brain oscillations, and the release of corresponding neuromodulators, in addition to neuromotor coordination and focused sensory attention [19,20]. The observed repetitive self-fondling of the vulva and clitoris appears as the "anlage" or the forerunner of the mature rhythmicity of the masturbatory stimulation emerging years later [6,8,20]. Sexual satisfaction and orgasm are essential, impacting overall physical and psychological well-being [16]. The complexity of the female sexual response, which is weakly linked to reproduction and unrelated to fertility, reflects the multifaceted nature of human sexuality. The differences in the ability to achieve orgasm among women are well-documented [16,21]. While some women can quickly achieve orgasm, 10-15% may face challenges in experiencing orgasm, even through masturbation [21]. This variation is not considered entirely attributed to genetically determined anatomical, hormonal, and neurological differences alone; the present report indicates that it is affected by emotional, relational, and cultural factors [16,21].

The orgasmic function

Our observation endorses the hypothesis that the function of female genital pleasure may be formed much earlier than in males, and it could be an adaptive trait rather than a mere byproduct of evolution [17]. It suggests that the female orgasm may serve a purpose beyond reproduction and could have adaptive functions related to pleasure, bonding, or other aspects of female physiology and behavior [17]. If this hypothesis holds, it raises questions about why some women do not retain the ability to experience orgasm despite the possibility of its early presence, even during prenatal life. Several factors may contribute to such differences. Like other aspects of human development, there is natural variation in individual experiences and capabilities; not all individuals retain the same abilities or traits from prenatal life throughout their postnatal existence [9,17]. As if glimpsed through a veil, the narrative describes the internal stirrings and psychological reverberations within the anorgasmic woman as she observes her unborn daughter's intimate gesture. The woman attributed parental environment and inhibitory early educational experiences to have impacted her sexual experiences and maturation [11,12,15]. and social norms influence individual behavior and emotions [13]. Regarding sexuality, regulatory norms inevitably shape social acceptance: behaviors and appearances that deviate from social conceptions are considered illegitimate, incomprehensible, and undesirable [10]. Prenatal experiences lay the foundation for the potential presence of a trait or function, and postnatal experiences and environmental factors influence how the trait develops and is expressed later in life. Parental attitudes toward sexuality, cultural norms, and social influences can shape the sexual development and behavior of offspring [11,12]. Experiences can influence and inhibit individual predispositions for learning, and a person might sacrifice their skills and needs to conform to external social norms and expectations, leading to emotional and psychological challenges that impact overall well-being and fulfillment in adulthood, especially in the realm of sexuality [10,12]. While some aspects of sexuality, including primary physiological responses, might have a biological metabolic basis, the development of sexual behaviors and experiences is significantly shaped by social and cultural factors: learning and socialization are critical in understanding and expressing sexuality [16,17,20,21].

Accordingly, the patient's subsequent reports indicate how social-familial norms impacted her emotional development and decision-making later in life [9,14,20]. Inhibitory actions during the postnatal educational process can affect the outcome of sexual behaviors and other pleasure-related

behaviors, potentially leading to neurobiological modifications in the emotional brain and sexual disorders [12,18,19]. Sexual experiences and the ability to achieve orgasm are regulated and influenced by a complex interplay of biological, psychological, social, and cultural factors [16,17,21]. If inhibitory pathways dominate, they may influence decision-making and limit the range of available responses to different situations, making some choices difficult or seemingly impossible until something extraordinary triggers change [6,19].

Ethics in sex education

As she quoted, the patient was able to empathize with her younger sister through observation of her daughter's sexual behavior, leading her to consider the possibility of freeing sex and pleasure from the influences of paternal norms. Conversely, the patient's younger sister was able to explore her sexuality more freely from their father's inhibitory control. This enlightenment then changed her sexual and relational life over time and the way she managed her daughter's sexual and sentimental education, far from her father's conservative rules. The patient reported during interviews that her daughter's sexual and relational life began early in adolescence and is independent, complete, and satisfying [14].

As the primary environment with which the fetus and newborn interact, the parental couple plays a crucial role in shaping the child's development. The capacity for empathic relationships, developed within the parental relationship, is essential for the educational process and the evolution of altruism and prosocial motivation [13]. Empathy forms the basis for knowing oneself and caring for the needs and feelings of others. It shapes an individual's ability to develop healthy relationships with oneself and others throughout life [10]. The prenatal period is critical for establishing both parents' emotional and cognitive foundations, which influence the child's well-being and the social functioning of the whole family. It highlights the importance of creating supportive and nurturing environments for pregnant women to promote positive fetal development and the growth of well-adjusted individuals. Overall, the complex interplay of prenatal experiences, early neurobehavioral development, and empathic relationships within the parental couple lays the groundwork for future human evolution and capacity for empathy, altruism, and prosocial motivation [13]. Understanding these aspects can inform educational approaches, parenting strategies, and the promotion of healthy social interactions, thereby fostering positive development, well-being, and self-expression in individuals and societies.

Sociocultural theorists suggest that gender differences in sexuality are shaped more by societal roles and expectations than by biology. Traits that help women adapt to gendered roles, especially in work and family, can have adverse effects on their sexual autonomy. Women's sexuality is considered more responsive to cultural and situational influences, whereas men's sexuality appears more biologically fixed [16]. The perceived rigidity in male sexuality may also stem from men's greater societal power, allowing them to shape situations to their advantage and reducing their need to adapt. Broader power inequalities, such as those related to gender, race, poverty, or health, also significantly impact how sexuality is experienced and expressed [16]. Biological and psychological factors set the framework for sexual potential, but social and cultural contexts largely determine whether sexual experiences are perceived as desirable and fulfilling.

Social norms, cultural expectations, and societal attitudes toward sexuality create pressures that inhibit (or disinhibit) individual responses [11,12,16-18,21]. Sexual equality is increasingly recognized and valued in many parts of the world. However, deeply ingrained social norms and attitudes can persist, perpetuating gender disparities and limiting individual autonomy and expression [11,16,21]. Overcoming these barriers and promoting sexual equality requires ongoing efforts to challenge harmful stereotypes, educate individuals about healthy and consensual relationships, free the female condition from the influence of the severe rules of patriarchy, and foster an inclusive social environment where diverse sexual identities and experiences are respected.

The awareness obtained through the insight produced by ultrasound observation has induced a significative change in the patient's personality and more effective sexual relationships: over the years, she left her husband, experienced orgasm, found a new partner with whom to have a satisfactory sexual life, and empowered the daughter to grow to have sexual, affective, and relationship experiences by herself. Widely, knowledge at a social level of the effects of early emotional learning and its importance in shaping sexuality and nature could facilitate the development of more consistent interpretative models and educational behaviors with human reality. Understanding the interplay between biological, psychological, and social influences on sexual behavior is essential for creating more inclusive and accepting societies that prioritize individual originality and respect for diversity.

Declarations

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None.

Competing interests

one

Authors' contributions

All authors contributed to the conception and design of the study. All authors read and approved the final manuscript

Compliance with Ethical Standard

Ethical approval was waived by the local IRB Office for case reports, in view of the retrospective nature of the study and all the procedures being performed were part of the routine care.

The study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments.

Authors declare to have adhered to the CARE reporting guidelines for case reports, as reported in guidelines hosted by the EQUATOR Network when preparing the manuscript.

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