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A Case of Sensory Deprivation Syndrome Evolving into Generalized Phobia in a Young Dog

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Abstract: Sensory deprivation during the sensitive developmental period represents a significant risk factor for the onset of emotional and behavioral disorders in dogs. The present paper describes the clinical case of Zoe, an eight-month-old mixed-breed dog raised in a domestic environment characterized by severe sensory and social impoverishment. The puppy exhibited intense fear responses, avoidance behaviors, freezing, and marked difficulties in interaction, consistent with a sensory deprivation syndrome that had evolved into generalized phobia.

The therapeutic approach was based on a multimodal protocol including reorganization of daily management, a structured behavioral rehabilitation program, and pharmacological support prescribed by a veterinarian with expertise in behavioral medicine. The intervention emphasized predictable routines and gradual exposure to stimuli.

At follow-up, a progressive improvement in exploratory behavior and a reduction in fear responses were observed, although the need for long-term management remained. This case highlights the central role of early experiences in canine behavioral development and the importance of an integrated, individualized approach in the management of sensory deprivation disorders.

Key Words: Canine behavior, Sensory Deprivation Syndrome, Generalized phobia, Selegiline.

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Signaling

Zoe is an eight-month-old intact female mixed-breed dog

History

Zoe, a small-sized mixed-breed dog, was adopted at four months of age from a domestic litter consisting of five puppies and their dam. The entire litter had spent the first months of life in a covered veranda, enclosed on all sides and lacking any view of the outside, located on the second floor of an apartment. As a result, the puppies were exposed to an environment characterized by extreme sensory and social deprivation.

At the time of collection, which took place using a carrier, the puppy already displayed clear signs of fear. Upon arrival at the new home, Zoe immediately retreated into a corner, showing marked fearfulness, poor body condition consistent with undernourishment, and a cranial lesion. She did not respond to attempts at interaction, either through play or the offering of food.

On the day following adoption, during her first outdoor experience, the puppy passed soft stools and displayed persistent refuge-seeking behavior, repeatedly attempting to escape toward protected areas. In response to this evident distress, the owner progressively reduced outdoor outings, allowing Zoe to eliminate indoors on puppy pads. In the following days, the puppy showed rapid and voracious feeding behavior even in the presence of the owner, engaged in play only when alone and unobserved, and exhibited episodes of nocturnal destructiveness. Significant difficulties in relating to the environment, unfamiliar people, and conspecifics were also noted.

Prior to adoption, Zoe had been weaned on pasta, rice, and dry food; after integration into the new household, her diet was standardized to an exclusive dry kibble regimen.

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The combination of these behaviors, together with pronounced fear responses and difficulties adapting to the new environment, represented the primary reason for seeking professional consultation. An initial educational assessment, including some preliminary activities, indicated the need for a more in-depth veterinary behavioral evaluation. Subsequently, trainers, in collaboration with a veterinarian specialized in behavioral medicine, established a new integrated program of observation and intervention.

Physical Examination Findings

After overcoming an initial phase of mild undernourishment, Zoe's general clinical condition was good. Vaccination prophylaxis was up to date, including scheduled booster doses, as were preventive treatments for cardiopulmonary dirofilariosis and leishmaniosis. The first vaccination was administered at the veterinary clinic; subsequent vaccinations were instead carried out at home, at the owner's request, in order to reduce the stress associated with clinic visits and to limit further potentially aversive experiences.

Behavioral Assessment

During the initial behavioral assessment conducted in the home environment, Zoe appeared to be in a marked state of anxiety and fear. The puppy remained immobile in a corner of the living room, maintaining a consistently low posture, with tense musculature and her head turned toward the wall, actively avoiding eye contact. Her behavior was characterized by persistent attempts to identify a possible escape route or a place to hide, associated with a markedly reduced exploratory drive and a complete absence of behavioral initiative. Under these conditions, it was not possible to establish any form of spontaneous interaction, either with the clinician or with the owner, even in the presence of potentially motivating stimuli such as food or play.

Subsequent observation in the outdoor environment confirmed and further exacerbated the behavioral picture observed indoors. Zoe exhibited a high level of emotional arousal, with rapid and disorganized movements, fragmented exploratory behavior, and marked motor agitation. The puppy repeatedly moved along the perimeter of the observed area, actively seeking protected or concealed locations, displaying a constant difficulty in establishing functional contact with both the environment and the people present. Her behavior appeared to be dominated by avoidance and escape responses, with a significant impairment in stimulus appraisal and contextual adaptation.

Analysis of a typical day provided additional elements supporting the clinical picture. Zoe's daily routine took place exclusively within the home environment; during daytime hours, the puppy remained predominantly immobile on her bed, located in a corner of the living room, exhibiting marked behavioral withdrawal. At night, conversely, episodes of destructiveness and solitary play were observed, occurring in the absence of interaction with the owner, suggesting dysregulation of activity rhythms and the adoption of maladaptive coping strategies.

Diagnosis

Based on the medical history, characterized by early isolation, severe environmental understimulation, and limited sensory and social experiences during the sensitive developmental period, as well as on the clinical signs observed during behavioral assessments, Zoe's clinical presentation was considered consistent with Sensory Deprivation Syndrome (SDS), which had subsequently evolved into a form of generalized or complex phobia (Mège, 2003; Gazzano & Ogi, 2021).

According to the French classification of behavioral disorders, several clinical signs observed in this case are attributable to a diagnosis of SDS. In particular, phobic responses to identifiable stimuli and a marked tendency toward negative anticipation fall within the criteria described for Stage 1 SDS (Mège, 2003). At the same time, inhibition of exploration, static exploratory behavior, and the adoption of waiting and immobile postures, documented during the assessments, are considered postural signs strongly indicative of a more advanced stage of SDS. These manifestations are also widely described in the international literature as expressions of impaired behavioral development secondary to early deprivation (Landsberg et al., 2013).

The main behavioral signs observed included prolonged freezing, escape and avoidance behaviors, hypervigilance, marked difficulties in interacting with the environment, unfamiliar people, and conspecifics, as well as disorganized nocturnal activity. The behavioral examination, conducted in collaboration with a veterinarian specialized in behavioral medicine, revealed a significant impairment in adaptive capacities and emotional modulation, with generalized fear responses to stimuli of varying nature and intensity.

Regardless of the classification system adopted, the history of early deprivation appears to represent a central etiopathogenetic factor. In particular, the inability to avoid or withdraw from negative social interactions during the socialization period may have contributed to the development of relational difficulties with conspecifics, while inadequate socialization with humans is likely identifiable as the primary cause of the intense fear responses observed in the presence of unfamiliar people.

Treatment

Medical treatment

To facilitate the rehabilitation process and reduce baseline anxiety, pharmacological support was introduced under the prescription of a veterinarian specialized in behavioral medicine. Selegiline (5 mg) was prescribed at a dosage of 0.5 mg/kg/day. The treatment was maintained throughout the entire duration of the rehabilitation protocol, with the aim of increasing the puppy's receptivity to the proposed stimuli and enabling her to benefit more effectively from the educational–behavioral intervention.

Behavioral modification techniques

The first area of intervention focused on reorganizing daily management and the relationship between Zoe and her owner. The primary objectives were to build a trust-based bond, provide the puppy with a predictable and secure routine, and equip the owner with the skills necessary to promptly recognize signs of stress and potential triggering factors. To this end, gentle interactions respectful of the dog's timing were encouraged, along with a gradual introduction to physical contact. Sudden movements and unexpected noises were avoided, while the management of feeding and resources (play and space) was structured to promote a sense of stability and control.

In parallel, a behavioral rehabilitation program was initiated through weekly sessions at a canine training center, conducted in a fenced and controlled area. The initial sessions focused on the neutral co-presence of the dog and the owner, without any demands for interaction, allowing Zoe to explore freely and without pressure. In subsequent phases, controlled socialization with other dogs was introduced, together with a series of gradual and diversified stimuli. The use of small containers filled with highly palatable food encouraged spontaneous approach behaviors and supported the development of the relationship. At the same time, a progressive habituation to the carrier, harness, and leash was implemented.

Follow Up

Over the course of the weeks, significant improvements were observed. Zoe showed a progressive increase in spontaneous exploratory behavior and a reduction in freezing episodes. Trust toward the owner increased, with the latter becoming a true secure base during the sessions. Greater emotional flexibility was also noted in novel contexts, and the introduction of walks in quiet areas using a harness and leash was successfully achieved. In parallel, Zoe's curiosity increased, along with her willingness to interact with other dogs in a more relaxed and functional manner.

Discussion

The clinical case of Zoe represents a meaningful example of the medium-term consequences of sensory and social deprivation during the first months of a dog's life and confirms the crucial role of early experiences during the sensitive period in the development of emotional and behavioral competencies (Mège, 2003; Landsberg et al., 2013). The absence of adequate environmental, social, and perceptual stimulation, as revealed by the medical history, likely contributed to the establishment of a pervasive fear profile that subsequently evolved into a form of generalized phobia (Gazzano & Ogi, 2020).

The literature highlights how inadequate management of the developmental environment, particularly in contexts characterized by isolation and limited stimulus variability, constitutes a significant risk factor for the development of persistent behavioral disorders. In this regard, the findings observed in Zoe's case are consistent with available evidence, which emphasizes the negative impact of impoverished and unstructured environments on canine emotional well-being, as well as the importance of careful, individualized management in the prevention of complex behavioral problems (Iacopini & Gazzano, 2024).

In the present case, the combination of a reorganization of daily management, a structured behavioral rehabilitation program, and pharmacological support resulted in a progressive clinical improvement. In particular, the establishment of a predictable routine, respect for the subject's individual timing, and the use of gradual and controlled exposure protocols promoted a reduction in freezing responses and escape behaviors, together with an improvement in exploratory behavior and interaction with the environment.

The owner's role as a secure base proved to be a central element in the rehabilitation process, contributing to the progressive modulation of the dog's emotional state and to her ability to cope with novel or potentially stressful situations. Given the history of early sensory deprivation, the development of a functional attachment to the primary caregiver was not initially present and therefore represented a specific therapeutic goal. Targeted work on the relationship and on the predictability of interactions facilitated the consolidation of this bond, leading to a reduction in fear and avoidance responses and an overall improvement in emotional stability (Mariti et al., 2020).

Pharmacological support and, more broadly, integrated supportive strategies may represent a valuable aid in the treatment of subjects with high emotional reactivity by facilitating responsiveness to behavioral interventions. Recent studies highlight how modulation of the microbiota–gut–brain axis and the use of nutraceuticals may contribute to the management of anxiety and phobic responses; however, they also point to substantial heterogeneity in outcomes and the need for a cautious, integrated clinical approach (Giuliano et al., 2024; Sacchettino et al., 2025). In Zoe's specific case, the severity of the clinical presentation did not allow reliance on nutraceutical interventions alone, making targeted pharmacological support necessary to reduce baseline anxiety and enhance the effectiveness of the rehabilitation program.

Despite the improvements observed at follow-up, Zoe's clinical condition remains compatible with a long-term management requirement and ongoing monitoring. Early deprivation history represents a relevant prognostic factor, necessitating careful attention to the dog's emotional needs and prudent management of future experiences to prevent relapse or exacerbation of phobic responses.

Overall, this case reinforces the importance of a multimodal and individualized approach in the management of behavioral disorders associated with sensory deprivation, demonstrating that a structured intervention can lead to meaningful improvements in emotional functioning and quality of life for both the dog and her family.

Conclusion

The clinical case of Zoe highlights the impact that early sensory deprivation can have on canine behavioral development and confirms the complexity of the clinical presentations that may arise from it. In the presence of generalized fear responses and a marked impairment of adaptive capacities, an accurate diagnostic framework is essential to appropriately guide therapeutic decision-making.

The clinical experience described suggests that a structured intervention, based on the integration of environmental management, behavioral rehabilitation, and pharmacological support when indicated, can promote functional improvement even in subjects with an unfavorable developmental history. In particular, work focused on the relationship with the primary caregiver and on the construction of a predictable context proved to be a key element of the rehabilitation process.

Despite the results achieved, cases such as the one presented require a long-term therapeutic perspective and continuous monitoring, underscoring the importance of a cautious and individualized clinical approach. This case further reinforces the value of prevention and appropriate puppy management during the early stages of life, while also providing useful insights for clinical practice in subjects affected by behavioral disorders associated with sensory deprivation.

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Sindrome da deprivazione sensoriale nel cane: descrizione di un caso clinico evoluto in fobia generalizzata e approccio terapeutico multimodale

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Sintesi

La deprivazione sensoriale e sociale durante il periodo sensibile di sviluppo rappresenta un rilevante fattore di rischio per l'insorgenza di disturbi comportamentali nel cane. Il presente lavoro descrive il caso clinico di Zoe, femmina meticcia di otto mesi, cresciuta in un ambiente domestico caratterizzato da grave impoverimento sensoriale e limitate esperienze sociali nei primi mesi di vita. Alla valutazione comportamentale, la cucciola presentava un quadro complesso di paura generalizzata, freezing prolungato, comportamenti di evitamento e fuga, marcata inibizione esplorativa e difficoltà di interazione con l'ambiente, con le persone e con i conspecifici, compatibile con una sindrome da deprivazione sensoriale evoluta in fobia generalizzata.

L'intervento terapeutico adottato è stato di tipo multimodale e ha previsto la riorganizzazione della gestione quotidiana, un programma strutturato di riabilitazione comportamentale e il supporto farmacologico prescritto da un medico veterinario esperto in comportamento. Il percorso ha privilegiato la costruzione di routine prevedibili, il rispetto dei tempi del soggetto e l'utilizzo di esposizioni graduali e controllate, con particolare attenzione alla relazione con la proprietaria come base sicura.

Nel follow-up sono stati osservati miglioramenti progressivi delle capacità esplorative e adattative e una riduzione delle risposte di paura. Il caso sottolinea l'importanza delle esperienze precoci e di un approccio clinico integrato e individualizzato nella gestione dei disturbi da deprivazione sensoriale.