

Post-Traumatic Functional Tics in an Adolescent: A Case Report and Literature Review

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Abstract

Case Report

Functional tic-like behaviors (FTLBs) are abrupt-onset motor and vocal manifestations often triggered by psychological trauma, differing from primary tic disorders such as Tourette syndrome by their phenomenology, female predominance, and poor pharmacological response. We report the case of a 15-year-old girl who developed severe tics, including head jerks, blinking, and guttural sounds, shortly after a knife assault to the face. Neurological examination, neuroimaging, and laboratory tests were normal, excluding organic causes. A diagnosis of functional tic disorder in the context of post-traumatic stress disorder was made. Management combined trauma-focused cognitive behavioral therapy, eye movement desensitization and reprocessing, habit reversal training, and short-term pharmacological support, leading to near-complete remission within six months. This case, consistent with rare reports in the literature, underscores the need for early recognition and targeted multidisciplinary treatment.

Keywords: Functional tic disorder; post-traumatic stress disorder; Adolescence; Tourette syndrome; case report.

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INTRODUCTION

Tics are defined as sudden, rapid, non-rhythmic motor movements or vocalizations, which are commonly associated with Gilles de la Tourette syndrome (TS), a neurodevelopmental disorder that manifests during childhood and is frequently accompanied by attention deficit hyperactivity disorder (ADHD) or obsessive-compulsive disorder (OCD) [1,2]. In contrast, functional tic-like behaviors (FTLBs) are not caused by neurobiological or genetic factors, but psychosocial or psychological stressors [3,4]. Unlike typical tics, they have a sudden onset during adolescence or early adulthood, predominantly affect females and show atypical, complex and suggestible movements. Recent studies highlight a rise in FTLBs during the pandemic, possibly linked to stress and social media exposure [5-6]. These presentations differ from tics in terms of phenomenology, onset and response to treatment.

The present case report details a case of severe functional tics in a 15-year-old patient following psychological trauma. A review of the differential diagnosis of late-onset tics is also provided, with particular emphasis on clinical features that distinguish

FTLBs from Tourette's Syndrome (TS) and tic-related autoimmune syndromes.

CASE PRESENTATION

A 15-year-old female patient with no significant medical or psychiatric history, with the exception of mild anxiety related to school performance, presented with a three-month history of sudden-onset motor and vocal tics following a traumatic event. She had sustained a severe injury to the face, specifically a knife wound, which resulted in a significant psychological impact. In the weeks following the incident, the subject began to demonstrate involuntary, abrupt movements, including head jerks (neck flexion and extension), excessive eye blinking, and vocalizations such as guttural throat sounds and small cries. These tics initially manifested as intermittent episodes, but rapidly escalated in both frequency and severity, resulting in significant disruption to the subject's daily life and ultimately leading to her withdrawal from school. In addition to these symptoms, the patient exhibited sleep disturbances characterized by recurrent nightmares related to the assault, irritability, and hypervigilance. However, she did not display marked phobic avoidance behaviors. This constellation

of symptoms was indicative of an acute post-traumatic stress response.

The neurological examination five days after presentation showed the patient was alert and oriented with normal vital signs. Cranial nerve function was intact, muscle tone and strength were normal, reflexes were preserved, coordination tests were normal, and gait was steady without ataxia. There were no other involuntary movements. The neurologist said the examination was unremarkable and suggested a functional motor disorder or acute stress syndrome. The psychiatric evaluation the following day described an anxious adolescent who avoided eye contact and wore a scarf around her neck to protect her neck, reflecting trauma. Her mood was dysphoric with anxiety but no suicidal or delusional thoughts. Cognitive screening was near normal (MMSE 29/30), and she showed partial insight into her symptoms. From a functional standpoint, she had ceased to attend school and had become socially withdrawn. Standardized scales revealed moderate to severe tic severity (YGTSS 34/50), moderate post-traumatic stress symptoms (CPSS 28/51), minimal depression (CDI 15/54), and moderate generalized anxiety (SCARED 35/82). A comprehensive etiological workup, encompassing brain MRI and EEG, yielded normal results. Routine blood tests and autoimmune screening revealed no abnormalities. Markers of recent streptococcal infection were negative, and tests for Wilson's disease were within normal limits. Despite rigorous examination, no organic cause for the tics was identified. Following a multidisciplinary discussion involving pediatric neurology and psychiatry, the diagnosis was functional tic disorder in the context of acute post-traumatic stress disorder. The late age of onset, the absence of a prior history of tics, and the clear temporal link with trauma were differentiating features that distinguished this condition from classic Tourette syndrome. The patient was subjected to a multimodal treatment plan, encompassing trauma-focused cognitive behavioral therapy (CBT) with two sessions of eye movement desensitization and reprocessing (EMDR) to address intrusive memories, and behavioral therapy through habit reversal training within a cognitive behavioral therapy (CBT) framework to manage tics. Low-dose aripiprazole was prescribed in order to reduce tic severity, with mild side effects being reported. Melatonin was administered for a short period in cases of sleep disturbances. After three months, tics became less frequent and intense, and patients reported better anxiety and sleep. After six months, vocal tics had disappeared and motor tics were rare. Aripiprazole was reduced and stopped without symptoms returning. This case shows how important it is to fully assess and treat trauma-related tics using a variety of methods.

DISCUSSION

This case demonstrates the correlation between traumatic events and functional tics, a phenomenon that

remains infrequently described in the literature. The patient, a 15-year-old female, exhibited sudden-onset functional tics following a knife assault, thus placing her in a rare but documented subgroup of psychogenic tics triggered by trauma. A comparable case involved a 16-year-old girl who developed motor and vocal tics after sexual assault. Her symptoms worsened during legal proceedings and no neurological cause was found, emphasizing psychological trauma as the main precipitating factor [7]. In contrast, Tourette syndrome (TS) has been shown to typically manifest during childhood without a direct link to traumatic events, and has been observed to persist over time. In contrast, the patient's tics were observed to resolve rapidly with treatment, which lends support to a functional or psychogenic etiology, as also reported by Robinson *et al.*, [8].

Carvallo *et al.*, conducted a study on a group of nine patients diagnosed with psychogenic tics (representing 4.9% of the 184 individuals initially assessed for borderline personality disorder). Their findings highlighted the absence of premonitory sensations, the absence of a family history of tics, an inability to suppress movements, and the coexistence of other psychogenic disorders, such as pseudo seizures [9].

From a pathophysiological perspective, primary chronic tics such as TS are theorized to result from dysfunction in cortico-striato-pallido-thalamo-cortical circuits, leading to reduced inhibition of motor programmers [10]. The "fronto-striatal disconnection" model is proposed as a theoretical framework to explain the involuntary nature of tics and their improvement with neurodevelopmental maturation. In TS, genetic, neurodevelopmental, environmental, and immunological factors have all been implicated, with no specific biological marker available to assist in diagnosis [11]. In the context of post-traumatic tics, two predominant mechanisms have been postulated: firstly, the occurrence of an organic injury resulting in neurophysiological alterations that precipitate tics; and secondly, the emergence of psychological trauma as a catalyst for a functional disorder. True secondary tics, arising from organic nervous system damage, are uncommon, although isolated reports have been documented following head injury or even whiplash, in the absence of detectable brain lesions [12]. Higgins and al. described an adult who developed severe tics immediately after a car accident without concussion; symptoms persisted for three years until surgical treatment of a jugular venous stenosis led to near-complete resolution suggesting a subtle organic mechanism, while also underscoring the need to rule out treatable biological causes before attributing symptoms solely to functional origins. In most cases, however, no organic lesion is found, and a functional (psychogenic) tic is the most likely explanation [13].

Our patient's presentation fits well within the framework of post-traumatic functional tics, a relatively rare but increasingly reported entity, which should be distinguished from primary neurodevelopmental tics such as TS and autoimmune tic disorders within the PANDAS/PANS spectrum, as they share similar motor and vocal symptoms but differ markedly in clinical features and management. (Table 1) summarizes the main distinctions.

The management of functional tics differs from that of primary tics, favoring a multidimensional approach focused on functional neurological rehabilitation and psychological support, while avoiding unnecessary drug treatments [14]. Neuroleptics or clonidine, frequently prescribed for the treatment of Tourette's syndrome, have been demonstrated to be generally ineffective and may also result in adverse effects. A study conducted by Cavanna *et al.*, reported either no response or an overly rapid improvement under neuroleptics in patients with functional tics, suggesting that the observed effects were more likely to be a placebo effect than a real pharmacological benefit [15]. Consequently, in the absence of diagnostic uncertainty, it is considered prudent to exercise caution in the administration of substantial medication. The provision of clear and reassuring information to patients and their families is of paramount importance in the reduction of anxiety and the encouragement of treatment adherence [16].

In our patient's case, once we explained that her tics were a reaction of her brain to the trauma she had experienced and that they could fade with targeted work, she became more receptive to therapeutic interventions. The literature also highlights the importance of

presenting positive signs of the functional disorder rather than describing it solely as a diagnosis of exclusion, in order to foster a strong therapeutic alliance [16].

In cases where the disorder is linked to trauma, psychological treatment of the underlying factor is a priority. Specialized therapies, including EMDR, have demonstrated efficacy in addressing both post-traumatic symptoms and tics [17].

Concurrently, behavioral retraining inspired by CBIT, adapted to functional tics (I-CBIT), aims to facilitate acceptance of internal sensations without triggering tics and to manage stress. In a recent publication, Maxwell and colleagues presented a case series involving eight adolescents with functional tic-like behaviors who were treated with a programmed known as Integrated CBIT (I-CBIT) [18], a combination of sensation acceptance therapy and stress management techniques. The results demonstrated a significant reduction, or even complete resolution, of tics in all patients following several months of treatment [19].

The integration of third-wave approaches, such as mindfulness and acceptance and commitment therapy, with relaxation techniques and a gradual reintroduction to activities, has been identified as a potentially efficacious approach. It is evident that physical therapy and occupational therapy can facilitate motor recovery. Furthermore, experimental techniques, including transcranial magnetic stimulation, are currently under investigation [20]. Finally, it is imperative that management strategies encompass the treatment of psychiatric comorbidities and the provision of school and family support to ensure optimal prognoses.

Table 1: Comparative Clinical and Paraclinical Features of Functional, Neurodevelopmental, and Autoimmune Tics

Characteristic	Functional Tics	Tourette Syndrome Tics	Autoimmune Tics (PANDAS/PANS)
Typical age of onset	Adolescence or young adulthood; rarely before 10–12 years	Childhood (average 5–7 years), almost always before 12 years	Childhood (often 5–10 years)
Sex ratio	female predominance	Male predominance (♂/♀ ≈ 3–4:1)	Slight male predominance reported
Mode of onset	Sudden, explosive – complex tics from the outset, peaking within days/weeks	Progressive initial simple tics followed by gradual spread to other tics over months/years	Sudden – by definition acute (< 48h) in PANDAS, often after streptococcal infection
Identifiable triggering factor	Major psychological stress (trauma, COVID confinement, social media mimicry)	Non-specific. Aggravating factors: stress, emotional excitement may worsen tics but no single initial cause	Infection (often group A β-hemolytic streptococcus) triggering an autoimmune reaction
Symptoms at onset	Frequent complex tics from the start (large motor tics, self-injurious behaviors, possible coprolalia)	Initial simple tics (blinking, throat clearing), then progressive complexification; coprolalia rare and late	Tics often accompanied by obsessive-compulsive symptoms.
Associated comorbidities	Anxiety and mood disorders very frequent (≥ 60%).	OCD or obsessions (≈ 50%), ADHD (≈ 50%), learning disorders, impulsivity;	Marked OCD (mandatory criterion in PANDAS), separation anxiety, behavioral regression, emotional lability.

Characteristic	Functional Tics	Tourette Syndrome Tics	Autoimmune Tics (PANDAS/PANS)
		anxiety disorders possible but less frequent.	
Brain imaging	Normal Possible findings in functional MRI: hyperactivation of amygdala/striatum in emotional situations (recent data).	Normal. Volumetric studies sometimes show subtle striatal volume reductions or dopaminergic functional abnormalities, without individual diagnostic value.	Structurally normal. Sometimes inflammatory abnormalities on PET scan or transient striatal FLAIR hypersignals reported in some severe cases (autoimmune encephalitis).
Biology	Classically normal. Recent markers: possible elevation of pro-inflammatory cytokines (IL-6, TNF- α ...) and slight CRP increase in some FND patients.	No specific biomarker. Sometimes elevated ASLO if intercurrent infection, without defining PANDAS. Immunological profile generally unremarkable.	ASLO or Anti-DNAse B positive (evidence of recent streptococcal infection) frequent in PANDAS.

CONCLUSION

Functional tics in adolescents, though less prevalent than Tourette Syndrome, necessitate early recognition, particularly in cases following psychological trauma. A positive diagnosis should be based on specific clinical features and a focused workup to exclude organic causes. The implementation of prompt, multidisciplinary management, with a focus on psychotherapy, rehabilitation, and family involvement, has been demonstrated to result in the rapid resolution of symptoms and the prevention of chronicity. The potential for enhancement of outcomes is further demonstrated by emerging therapeutic approaches, including online interventions and non-invasive neuromodulation.

Informed Consent

The patient provided written informed consent for the publication of this case report, including anonymized medical data and the results of psychiatric follow-up.

Conflict of Interest Statement

The authors declare that they have no conflicts of interest related to this article.

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