Acta Scientific Neurology (ISSN: 2582-1121)

Volume 5 Issue 6 June 2022

Case Report

Between the Devil and the Deep Blue Sea: A Rare Case of Striatal Deformity in Drug-Induced Parkinsonism

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Received: April 04, 2022

Published: May 24, 2022

Abstract

Drug-induced Parkinsonism (DIP) is a common intersection for Neurologists and Psychiatrists. Here we present a patient with a high probability of Drug-induced Parkinsonism (DIP) with striatal hand deformity as a sign of DIP. The case is extremely rare and may provide clues to the condition's overlapping nature and pathogenesis, particularly given her prolonged exposure to early generation dopamine antagonists. Furthermore, we have not identified a reported case of striatal hand contractures in a patient with drug-induced Parkinsonism, which sheds light on essential clinical and ethical conundrums.

Keywords: Drug-Induced Parkinsonism; Striatal Deformity; iPD

Introduction

The term 'striatal' is used because the deformities are believed to be caused by pathology in the neostriatum (caudate and putamen); however, the pathogenesis is unknown.

Charcot first described striatal deformities in 1877 as reminiscent of rheumatoid arthritis but without the inflammation usually seen in that disease [1]. Later Martin and Gortvai identified these contractures specifically in patients with Parkinson's disease [2,3]. Since then, there has been a clear body of evidence describing this presentation associated with the latter stages of Parkinson's disease. With the advent of atypical antipsychotics and increased awareness of these side effects by prescribers, these effects have been reduced; however, they are still commonly seen in patients with psychosis experiencing Parkinsonism, tardive dyskinesia, or other extrapyramidal side effects (EPS).

Typically, patients present with a medication history revealing the long-term use of dopamine antagonists. Clear demarcation between Idiopathic Parkinson's Disease (iPD) and DIP with certainity is impluasible; however, incorporating a comprehensive history, physical examination, and appropriate imaging can leave the author reasonably convinced about the etiology. Time can also assist in confirming the etiology, as DIP and iPD have significantly different clinical courses post-diagnosi.

Striatal deformities are frequently described in iPD, and there seem to be few studies demonstrating these contractures in patients with DIP. A case of striatal toe in a patient with suspected DIP has been reported in the literature [4]. Otherwise, there seems to be a lack of literature describing such deformities. Here we present a case of striatal deformity in DIP, which is rarely reported in the literature, with its associated clinical significance. This condition usually presents only in the late stages of iPD and may give cues to the common pathophysiology of the two states.

Case History

Our patient is a 71-year-old woman who came to our attention during an acute admission with psychotic symptoms. She had been diagnosed initially with schizophrenia, aged 39 years. Antipsychotics were initiated at 39 and with near-constant exposure over three decades as follows.

- **Age 39 to 47:** Haloperidol 5mg daily per oral with variable compliance.
- **Age 47 to 52:** Haloperidol IMI depot 50mg IMI 4 weekly (Haloperidol dose has been gradually reduced over two years from 50mg 4 weekly to 20mg 6 weekly over this period and ceased). Compliance has been maintained using involuntary provisions under Mental Health Act.
- **Age 52:** Risperidone Oral 1-3mg daily for six months with variable compliance.
- **Age 52 to 53:** Flupenthixol Depot IMI 20mg 2 weekly for about one year. Compliance has been maintained using involuntary provisions under Mental Health Act.
- **Age 53 to 58:** Flupenthixol IMI. (Zuclopenthixol dose has been gradually reduced over six years from 200mg 2 weekly to 75mg 6 weekly). Compliance has been maintained using involuntary provisions under Mental Health Act.
- **Age 58 to 67:** Risperidone IMI 37.5mg 2 weekly. Compliance has been maintained using involuntary provisions under Mental Health Act.
- **Age 67 to 69:** Paliperidone 75mg IMI 4 weekly. (Paliperidone dose has been gradually reduced over two years from 75mg 4 weekly to 50 mg 4weekly).
- **Age 69- 70:** Aripiprazole long acting injectable 200mg 4 weekly for six months

A the time of write up, the patient was on nil psychotropics for two years, despite remaining psychosis.

In this patient extrapyramidal symptoms appeared three years after initiating oral Haloperidol treatment with the first noted features: bilateral stiffness of limbs, akathisia, reduced shoulder swing with gait, and restricted affect. Hand contractures were first observed almost 25 years later when the patient was 66. However, the only other signs of Parkinsonism were some bradykinesia of the hand without hypokinesia. Bradykinesia had worsened over the recent five years and with fixed bilaterally symmetrical contractures.

Psychotropic	Duration in years
Haloperidol (PO)	8
Haloperidol (IMI)	5
Risperidone (PO)	1
Flupenthixol (IMI)	2
Zuclopenthixol (IMI)	5
Risperidone (IMI)	7
Paliperidone (IMI)	2
Aripiprazole (IMI)	1
No psychotropics	2

Table1: Chronological order of psychotropic summary.

(PO= per oral, IMI= Intramuscular injection)

Her sleep hygiene was impressive without any REM (Rapid Eye Movement) type sleep disorder and her sense of smell was well preserved. There was no history of urinary or bowel incontinence as well.

Her past medical history beyond her psychiatric condition was unremarkable. She was not on other medications lifelong, was a non-drinker and non-smoker with no family history of iPD.

Examination findings

Cranial nerve examination

Normal cranial nerve functions were noted with a preserved sense of smell, no tardive dyskinesia, and normal facial power and reflexes were noted with mask-like facial appearance and reduced blinking rate.

Peripheral examination

Striatal deformity was limited to hands; thus feet were preserved. A bilaterally symmetrical hand tremor of approximately 4 Hz frequency was noted, which decreased with intent and was not postural. Other joints, including the ankles and toes, were clinically normal (Figures 1 and 2).

Reflexes, power, and tone were normally preserved with no signs of postural instability with possible early camptocormia. However, the hips and knees had no flexion, as might be expected in iPD. There was no sign of antecollis, scoliosis or Pisa Syndrome and a cerebellar examination was normal. Cognition was remarkably preserved, with Addenbrooke's cognitive examination scoring 97/100.

Figure 1

Figure 2

Investigations

Laboratory investigations were unremarkable, including the Rheumatoid factor, ESR, CRP, and Connective tissue antibodies (ANA, Anti dsDNA, ANCA, ANA, serum copper and iron studies) failing to reveal an alternative diagnosis. MRI brain was unremarkable.

Medical imaging

Her hand appeared on the X-ray and was consistent with examination findings with no evidence of Rheumatoid arthritic features (Figure 3).

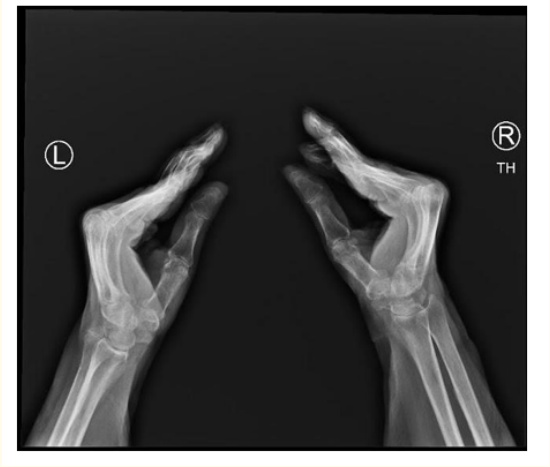

Figure 3: Hand X Ray.

Discussion

Typical signs of Parkinson's Disease in chronic iPD such as asymmetry of presentation, increasing bradykinesia and hypokinesia, REM sleep disorder, autonomic dysfunction and Lewy Body or iPD type dementia were interestingly absent in this case. Should the striatal deformity be due to iPD, such late-stage iPD features would be expected in this woman. Both motor and nonmotor symptoms help differentiate the two conditions clinically. Usually, DIP manifests with minor tremors and minimal gait dysfunction, more symmetrical symptoms and upper extremity predominance compared to patients with iPD [7-9]. Besides, DIP typically displays fewer urinary symptoms and constipation, fewer concentration problems and little REM sleep disturbance [7]. In addition, olfactory dysfunction is less frequent in patients with DIP, which is often helpful as a bedside test [7,10].

Moreover, discontinuing a suspected offending drug will usually resolve symptoms within four months in DIP [11]. However, in some DIP cases, they can persist and are reclassified as having possible pre-existing nigrostriatal impairment [12]. Nevertheless, distinguishing DIP from other Parkinson's diseases on clinical grounds alone is quite challenging. Still, there is substantial evidence in the literature to suggest that DaT scanning can be a helpful technique. More recently, nigrosome 1 MR imaging has shown a high diagnostic accuracy [15]. In this case, most clinical features

favour DIP in contrast to iDP, including mirror-image like bilaterally symmetrical clinical progression. Interestingly, the extrapyramidal symptom progression almost plateaued when the patient was monitored with no antipsychotics for two years, favouring DIP.

Evidence for DIP in contrast to iDP in this case

- The onset of symptoms after exposure to typical antipsychotics
- Early-onset at age 42 (iDP late onset)
- Long-term typical Antipsychotic therapy
- Absent family history of iPD
- Bilaterally symmetrical onset and progression of stiffness and deformity
- Preserved olfactory sensation: No evidence of a distorted sense of smell.
- Absent speech symptoms such as impaired voice, soft speech, or voice box spasms
- Minimal evidence for facial or jaw stiffness
- Preserved postural stability with minimal bradykinesia
- Minimal evidence for cognitive symptoms such as amnesia, confusion, dementia, or difficulty in thinking and understanding (Addenbrooke cognitive examination score: 97%)
- Minimal evidence for urinary symptoms such as dribbling of urine or leaking of urine
- Minimal evidence of daytime sleepiness, early awakening, nightmares, restless sleep, or sleep disturbances.
- Absence of visual hallucinations
- The slow progression of symptoms
- Plateauing of symptoms after discontinuation of antipsychotics
- Lack of evidence for Lewy body type dementia with vivid visual hallucinations

Accordingly, we believe this is a rare case of striatal deformity in DIP on clinical grounds. Approximately 33% of patients with Parkinsonism will have striatal deformities, more common in women [16]. Overactive muscle contractions due to the loss of inhibition by the extrapyramidal system, muscular rigidity, ligamentous laxity in females (possibly from a hormonal influence), muscle shortening and deformity from sustained contraction have all been proposed with no exact mechanism identified [17]. In this case, the most likely cause for the above deformity is the predominant exposure to typical antipsychotics. Based on our knowledge, this is the possible first reported case of striatal deformity in drug-induced Parkinsonism.

Balancing the risks vs benefits of antipsychotics in a lengthy therapeutic journey could be highly challenging when the patient is acutely psychotic with some potential disabling and disfiguring adverse effects being decades away. Therefore, a careful approach with recovery-based principles whilst empowering the patient in decision-making will be essential, especially when medications are administered under involuntary provisions. Firm efforts to abolish psychotic symptoms while overriding patient wishes at the expense of disabling side effects can be counterproductive. Accordingly, this case sheds light on broader shifts in pharmacovigilance and the recovery framework in mental health practice over the last several decades.

Conclusion

When DIP emerges, resolving psychosis becomes immensely challenging. Whilst continuation of antipsychotics can exacerbate motor symptoms, withholding or tapering these medications can precipitate psychosis. Therefore, "to treat or not to treat?" is a clinical dilemma that often leaves clinicians helpless and stuck between two equally unpleasant poles, 'the devil and the deep blue sea'. Furthermore, long-term typical antipsychotic therapy can lead to side effects. Hence, careful pharmacovigilance is essential.

Disclosures

No dedicated funding or grants has been sought or provided for this case study.

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