

RESEARCH



CHRISTMAS 2015: POLITICAL SCIENCE

“Gunslinger’s gait”: a new cause of unilaterally reduced arm swing



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Abstract

Objective To postulate a new possible cause of a unilaterally reduced arm swing in addition to the known medical conditions such as shoulder pathology, Erb’s palsy, stroke, and Parkinson’s disease.

Methods Analysis of YouTube videos depicting the gait of highly ranked Russian officials.

Results We found a similar walking pattern in President Vladimir Putin, Prime Minister Dmitry Medvedev and three other highly ranked Russian officials, all presenting with a consistently reduced right arm swing in the absence of other overt neurological abnormalities.

Conclusions We propose that this new gait pattern, which we term “gunslinger’s gait,” may result from a behavioural adaptation, possibly triggered by KGB or other forms of weapons training where trainees are taught to keep their right hand close to the chest while walking, allowing them to quickly draw a gun when faced with a foe. This should be included in the differential diagnosis of a unilaterally reduced arm swing.

Introduction

If you ever find yourself in a neurology meeting and notice a group of individuals scrutinising the way people walk, they are likely to be movement disorder enthusiasts. Their passion to screen for abnormal walking patterns may extend to examining YouTube footage, where remarkable discoveries can be made.¹ We were struck to find several consecutive YouTube recordings of Russia’s president, Vladimir Putin, manifesting a clearly reduced right-sided arm swing (video 1, segments 1 and 2). Putin’s distinctive walk has been debated previously, and different theories emerged, ranging from Erb’s palsy to intrauterine stroke.² For movement disorders experts such as ourselves, the first, and admittedly biased, diagnosis that comes to mind is Parkinson’s disease, in which an asymmetrically reduced arm swing is a distinct feature.³ In fact, it can be the

earliest presenting sign of Parkinson’s disease, as was demonstrated by video reviews of football games played by the legendary English midfielder Ray Kennedy.⁴ Original footage showed an asymmetrically reduced arm swing even when Kennedy played elite football; only later this proved to be the presenting sign of his Parkinson’s disease.⁴

The topic of early “preclinical” Parkinson’s disease is the subject of a lively debate.^{2,6} It is now clear that many symptoms and signs (such as constipation or reduced smell) can precede overt Parkinson’s disease. This preclinical phase includes a reduced arm swing on one side. Indeed, an asymmetrically reduced arm swing can present in otherwise clinically intact subjects with a predisposition to later develop Parkinson’s disease.⁷ Such observations raised a debate among us whether President Putin might possibly be in an early stage of Parkinson’s disease, even in the absence of other obviously suggestive features.

However, further review of YouTube footage revealed an alternative and more likely explanation, which we present here as a new cause of a reduced arm swing during walking.

Methods

Searching for possible explanations, we encountered a training manual of the former Russian KGB.⁸ According to this manual, KGB operatives were instructed to keep their weapon in their right hand close to their chest and to move forward with one side, usually the left, presumably allowing subjects to draw the gun as quickly as possible when confronted with a foe. Indeed, under “Chapter 2–Movement,” the manual gives the following instruction: “When moving, it is absolutely necessary to keep your weapon against the chest or in the right hand. Moving forward should be done with one side, usually the left, turned somewhat in the direction of movement.” We wondered whether

this could explain President Putin's gait, since he had received KGB training earlier in life.⁹ If this were true, then it would be reasonable to expect a similar gait "abnormality" in other Russian officials who might have received similar instruction during weapons training by the KGB or other military or intelligence agencies. We therefore performed a YouTube search for videos of other Russian officials, with surprising results.

Results

An asymmetrically reduced arm swing was identified in several highly ranked Russian officials, including the current prime minister, Dmitry Medvedev, two former ministers of defence (Anatoly Serdyukov and Sergei Ivanov), and Anatoly Sidorov, a highly ranked military commander.

Case 1: Vladimir Putin (president of Russia)

Video 1, segment 1 shows Putin walking with a virtually absent right arm swing along the red carpet in the Kremlin. Segment 2 confirms the consistency of this finding, several years earlier, making it unlikely that an intermittent problem (such as a painful shoulder) explained the arm swing reduction. Segment 3 shows Putin displaying his considerable judo skills, excluding marked paresis or a chronic orthopaedic problem as cause of the asymmetrically reduced arm swing (which is again clearly discernible in this video). A diagnosis of Parkinson's disease is unlikely, because other video material (segments 4-6) show no evidence of tremor, handwriting is fast without evidence of micrographia, right hand movements are agile, and Putin has no difficulty lifting weights with both arms. He is also an excellent swimmer, with symmetrical arm movements (<http://www.theguardian.com/world/2009/aug/06/vladimir-putin-butterfly-stroke>). This movement pattern persisted unchanged over several years, which is inconsistent with a neurodegenerative disorder such as Parkinson's disease. The handwriting suggests that Putin is right handed (segment 4).

Case 2: Dmitry Medvedev (current prime minister)

Medvedev has not received formal military training,¹⁰ but, when walking on the red carpet during his presidential inauguration, his right arm swing was markedly reduced (video 2, segment 1). In segment 2, Medvedev and Putin are walking side by side, both with a clearly reduced right arm swing. A commentary noted that Medvedev was "trying to ape Putin's macho gait."¹¹ Medvedev's reduced arm swing is also clearly visible in segment 3, where Medvedev proposes Putin for president for the upcoming elections. Medvedev has no difficulty lifting weights with both arms, excluding a structural right arm problem (video 1, segment 6). Like Putin, Medvedev seems right handed (video 2, segment 4).

Case 3: Anatoly Serdyukov (minister of defence 2007-12)

Video 3, segment 1 shows Anatoly Serdyukov stepping out of a car and walking towards President Putin with a reduced right arm swing. Segment 2 unequivocally demonstrates Serdyukov's reduced right arm swing on a different occasion. A signing ceremony suggests that he too is right handed (segment 3). There is uncertainty whether Serdyukov received military training, although one source claims he was in the Soviet Army for at least one year.¹² However, his position as minister of defence for five years does establish a clear link to the military apparatus in Russia.

Case 4: Sergei Ivanov (minister of defence 2001-07, present chief of the presidential administration of Russia)

Video 4, segment 1 shows Sergei Ivanov, at the time minister of defence and President Putin's friend and KGB colleague,¹³ displaying a markedly reduced right arm swing. Segment 2 again shows Ivanov walking with a reduced right arm swing. Segment 3 shows a third occasion where Ivanov walks alongside Putin and Medvedev with a reduced right arm swing. A signing ceremony suggests that Ivanov is right handed (segment 4).

Case 5: Anatoly Sidorov (current commander of the Western Military District)

Video 5 shows Anatoly Sidorov walking with a reduced right arm swing. A photograph of him holding a pointer stick in the right hand suggests he is right handed (fig 1⇓).

Discussion

Five highly ranked Russian officials presented with an asymmetrical arm swing, which was always reduced on the right side and which was observed consistently during separate occasions in four cases. We considered several explanations. It is unlikely that the right arm swing reduction can be attributed to a strong preference for the left arm. Cases 1-4 readily sign documents with their right hand, and case 5 uses the right hand for gesturing, so all seem to be dextral. Putin's habit of wearing his watch on the right wrist has fuelled speculation regarding his hand dominance. However, Putin does this to prevent the winding mechanism sticking into his hand—a downside to wearing big watches, which Putin prefers.¹⁴

We do not think that the reduced arm swing signals the presence of Parkinson's disease in these Russian officials. A diagnosis of Parkinson's disease requires, by definition, not only the presence of bradykinesia (this could be the reduced arm swing), but also the presence of rest tremor or rigidity, or both.¹⁵ None of the five Russian officials displayed any other evident motor signs suggestive of early parkinsonism. For example, Putin has otherwise excellent motor skills: his handwriting is fast, there is no micrographia or tremor, right hand movements are fast, he is a judo black belt and an excellent swimmer, and has no difficulty lifting weights. This contrasts markedly with, for example, Adolf Hitler, for whom videos and photos established a convincing case of Parkinson's disease, with not only a reduced use of one arm but also a progressive course of hypomimia, rest tremor, micrographia, stooped posture, hypokinesia, and shuffling gait.^{16 17}

We also consider it unlikely that the arm swing reduction reflects a preclinical stage of parkinsonism. This preclinical stage does not require presence of other motor signs, but is characterised by non-motor signs such as rapid eye movement sleep behaviour disorder or constipation.²⁻⁶ These could understandably not be retrieved from the videos. One might argue that these five men, who all seem to be right handed, would be prone to develop early parkinsonian symptoms on the right side, because the symptoms emerge more often on the dominant hand side.^{18 19} However, the highly consistent presentation across five officials with a similar career profile argues against this possibility. Moreover, this movement pattern remained unchanged for years in all cases, whereas Parkinson's disease would more likely be associated with appearance of other motor features within the observed period.

Rather than interpret this gait pattern as pathological, we propose that it is a behavioural adaptation resulting from military or

intelligence training. A supportive argument is the fact that trainees undergoing KGB training are taught to keep their right hand close to the chest even while walking, allowing them to quickly draw a gun when faced with a foe. It is conceivable that other forms of weaponry training are associated with a similar behavioural gait adaptation. Indeed, we found other examples of a reduced arm swing related to weaponry training: cowboys depicted in movies of the “Wild West” often have a reduced right arm swing. This motivated us to introduce the term “gunslinger’s gait” to label this new gait phenotype.

To support this case, it is essential to link the Russian officials to KGB membership, or at least to other forms of weaponry training. Both Putin and Ivanov were KGB officials, but this is not the case for Medvedev, Serdyukov, and Sidorov. However, Sidorov is a current member of the Russian military, so he has clear links to the military apparatus. Serdyukov served in the Soviet Army for at least one year, but there is no evidence for additional military training. However, he was minister of defence for five years, so he too has clear links to the military apparatus in Russia. The case is weakest for Medvedev, who does not have unequivocal links to any military or intelligence agency. However, one reason why he might display gunslinger’s gait is the “imitate the boss” phenomenon: substantial evidence suggests that Medvedev is being coached to sound, look, and, importantly, walk like the president.^{20,22} The similarities between Putin and Medvedev, particularly in terms of gait, have been acknowledged before.²³ One article commented on Medvedev’s gait during the Russian presidential election in 2008: “When the result was announced Putin and Medvedev walked out together onto Red Square in leather jackets and jeans, Medvedev trying to ape Putin’s macho gait” (video 2, segment 2).¹¹ It is thus conceivable that Medvedev’s reduced arm swing is also a behavioural adaptation. Similar mechanisms may be at play for other Russian officials, who are known to adapt mannerisms from their superiors (“It is nothing new in Russia to imitate the boss”).²² Indeed, many top level bureaucrats and members of the United Russia party have taken up the habit of wearing their watch on the right side, as Putin does, to show their allegiance.²⁴

This imitation phenomenon has parallels in the field of neurology, in cases of hyperekplexia. Specifically, gene-negative relatives of affected individuals (that is, those with the minor form of hyperekplexia) can display the exaggerated startle reflexes seen in the genetically affected individuals with the major form of hyperekplexia. This minor form of hyperekplexia could represent a learnt (behaviourally adapted) startle reflex in subjects who are subjected regularly to family members with organic startle attacks.²⁵ Once adopted, such behavioural changes can persist for long periods and even become permanent. Certainly, long term effects of repeated physical training and acquisition of particular walking patterns, such as in ballet dancers or soldiers, can occur.^{21, 22} Additional evidence comes from patients with psychogenic movement disorders; their movement abnormalities also represent a behavioural adaptation, and the longer these persist, the more chronic and persistent they become.²³

It is perhaps no surprise that our discovery was based largely on video coverage of major events in Russia, where Putin and other officials marched long distances along red carpets, creating perfect conditions for gait examination. We always tell our neurology residents that one cannot adequately assess gait (and especially arm swing) in the limited confines of the consulting room and urge them to take their patients out into the corridor. The video clips presented here exemplify this well.

We conclude that unawareness of weaponry training might lead clinicians to misdiagnose healthy individuals as having a

pathological gait, perhaps even parkinsonian. We recommend that neurologists, in particular those working in Russia, include “gunslinger’s gait” in their differential diagnosis of an asymmetrically reduced arm swing, along with other known causes such as Parkinson’s disease and shoulder pathology.

Professor Niall Quinn first identified the absent arm swing in case 1 and helped revise earlier versions of the manuscript. We thank Mr Michel Verbruggen for his expert assistance in editing the videos.

Contributors: RA identified most of the videos and drafted the first version of the manuscript. JJF commented on earlier versions of the manuscript. AA discussed cases 1-5 with neurologists in Russia and commented on later versions of the manuscript. BRB took the initiative for this manuscript, offered substantial input to all versions of the manuscript, and is the guarantor of the article.

Funding: BRB was supported by a research grant of the National Parkinson Foundation.

Competing interests: BRB has received honoraria for serving on the scientific advisory board for Zambon and Danone, and received research support and grants from the National Parkinson Foundation, the Netherlands Organisation for Scientific Research (NWO), the Michael J Fox Foundation, Prinses Beatrix Spierfonds, Stichting Parkinson Fonds, and Alkemade-Keuls Fonds. AA has received compensation for consultancy and speaker related activities from UCB, Boston Scientific, Boehringer Ingelheim, AbbVie, and Zambon; received research support from Mundipharma, Neureca Foundation, Italian Ministry research grants (RF-2009-1530177 and RF-2010-2319551), and Horizon 2020 Program grant (No 643706); and serves as consultant for Boehringer-Ingelheim for legal cases on pathological gambling.

Transparency: BRB, the guarantor, affirms that the manuscript is an honest, accurate, and transparent account and that no important aspects have been omitted.

- 1 Stamelou M, Edwards MJ, Espay AJ. Movement disorders on YouTube--caveat spectator. *N Engl J Med* 2011;365: 1160-1. doi:10.1056/NEJMc1107673 21992142
- 2 Berg D, Lang AE, Postuma RB. Changing the research criteria for the diagnosis of Parkinson’s disease: obstacles and opportunities. *Lancet Neurol* 2013;12: 514-24. doi: 10.1016/S1474-4422(13)70047-4 23582175
- 3 Bloem BR, Bhatia KP. Gait and balance in basal ganglia disorders. In: Bronstein AM, Brandt T, Nutt JG, Woollacott MH, eds. *Clinical disorders of balance, posture and gait*. 2nd ed. Arnold, 2004: 173-206.
- 4 Lees AJ. When did Ray Kennedy’s Parkinson’s disease begin? *Mov Disord* 1992;7: 110-6. doi:10.1002/mds.870070203 1584235
- 5 Goldman JG, Postuma R. Premotor and nonmotor features of Parkinson’s disease. *Curr Opin Neurol* 2014;27: 434-41. doi:10.1097/WCO.000000000000112 24978368
- 6 Berg D, Postuma RB, Bloem B. Time to redefine PD? Introductory statement of the MDS Task Force on the definition of Parkinson’s disease. *Mov Disord* 2014;29: 454-62. doi:10.1002/mds.25844 24619848
- 7 Nürnberger L, Klein C, Baudrexel S. Ultrasound-based motion analysis demonstrates bilateral arm hypokinesia during gait in heterozygous PINK1 mutation carriers. *Mov Disord* 2015;30: 386-92. doi:10.1002/mds.26127 25545816
- 8 Dolmatov AI. *KGB Alpha Team training manual: how the soviets trained for personal combat, assassination, and subversion*. Paladin Press, 1993.
- 9 Gessen M. *The man without a face; the unlikely rise of Vladimir Putin*. Blue River Books, 2012.
- 10 The government of the Russian Federation, biography of Dmitry Medvedev. 2014. <http://government.ru/en/gov/persons/183/bio>.
- 11 Roxburgh A. *The strongman: Vladimir Putin and the struggle for Russia*. IB Tauris, 2013.
- 12 Wikipedia. Anatoly Serdyukov. 2014. http://en.wikipedia.org/wiki/Anatoliy_Serdyukov.
- 13 Wikipedia. Sergei Ivanov. 2015. https://en.wikipedia.org/wiki/Sergei_Ivanov.
- 14 HomeEnglish. Vladimir Putin. 2015. <http://www.homeenglish.ru/Articles/Putin.htm>.
- 15 Berg D, Postuma RB, Adler CH. MDS research criteria for prodromal Parkinson’s disease. *Mov Disord* 2015;30: 1600-11. doi:10.1002/mds.26431 26474317
- 16 Gerstenbrand F, Karamat E. Adolf Hitler’s Parkinson’s disease and an attempt to analyse his personality structure. *Eur J Neurol* 1999;6: 121-7. doi:10.1111/j.1468-1331.1999.tb00003.x 10053222
- 17 Boettcher LB, Bonney PA, Smitherman AD, Sughrue ME. Hitler’s parkinsonism. *Neurosurg Focus* 2015;39: E8. doi:10.3171/2015.4.FOCUS1563 26126407
- 18 Uitti RJ, Baba Y, Whaley NR, Wszolek ZK, Putzke JD. Parkinson disease: handedness predicts asymmetry. *Neurology* 2005;64: 1925-30. doi:10.1212/01.WNL.0000163993.82388.C8 15955945
- 19 van der Hoorn A, Burger H, Leenders KL, de Jong BM. Handedness correlates with the dominant Parkinson side: a systematic review and meta-analysis. *Mov Disord* 2012;27: 206-10. doi:10.1002/mds.24007 21994149
- 20 Blomfield A. Medvedev coached to be more like Putin. *Telegraph* 2008 Feb 29.
- 21 Parfitt T. Spin doctors reinvent the ‘Nano-President’. *Observer* 2008 Mar 2.
- 22 Mereu F. Medvedev taking words from Putin’s mouth. *Moscow Times* 2008 Feb 27.
- 23 Kolesnikov A. Vladimir Putin toppled himself. *Kommersant* 2008 Aug 5.

- 24 Osborn A. Vladimir Putin hands over watch to cheeky metalworker. *Telegraph* 2009 Sep 15.
- 25 Bakker MJ, van Dijk JG, van den Maagdenberg AM, Tijssen MA. Startle syndromes. *Lancet Neurol* 2006;5: 513-24. doi:10.1016/S1474-4422(06)70470-7 16713923

Accepted: 05 11 2015

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Figure



Fig 1 Anatoly Sidorov talking to Minister Shoigu, holding a pointer with his right hand. Source: <https://russiandefpolicy.files.wordpress.com/2014/06/shoygu-with-western-md-commander-general-colonel-anatoliy-sidorov-photo-mil-ru.jpg>