Supplementary Table 1. Clinical details in dyskinetic PD patients.

| Case | Disease duration (years) | Age/sex | Side onset of PD | UDysRS Part III |
|------|--------------------------|---------|------------------|-----------------|
|      |                          |         |                  | Item 16 (face)  |
|      |                          |         |                  | Item 17 (neck)  |
|      |                          |         |                  | Item 18 (right shoulder/arm) |
|      |                          |         |                  | Item 19 (left shoulder/arm) |
|      |                          |         |                  | Item 20 (trunk) |
|      |                          |         |                  | Item 21 (right hip/leg) |
|      |                          |         |                  | Item 18+21     |
|      |                          |         |                  | Item 19+22     |
| 1    | 3                        | 51/M    | R                | 0               |
| 2    | 6                        | 63/F    | L                | 0               |
| 3    | 13                       | 56/M    | R                | 1               |
| 4    | 12                       | 75/M    | L                | 0               |
| 5    | 5                        | 55/M    | L                | 3               |
| 6    | 7                        | 73/F    | R                | 1               |
| 7    | 7                        | 67/M    | L                | 0               |
| 8    | 7                        | 54/F    | L                | 0               |
| 9    | 13                       | 67/M    | L                | 0               |
| 10   | 10                       | 61/M    | R                | 2               |
| 11   | 10                       | 64/F    | L                | 0               |
| 12   | 25                       | 64/F    | L                | 2               |
| 13   | 9                        | 72/M    | L                | 0               |
| 14   | 13                       | 62/F    | R                | 0               |
| 15   | 15                       | 65/F    | L                | 0               |
| 16   | 2                        | 65/M    | R                | 0               |
| 17   | 9                        | 65/F    | L                | 0               |
| 18   | 10                       | 51/M    | L                | 0               |
| 19   | 9                        | 75/M    | R                | 0               |
| 20   | 4                        | 61/F    | R                | 0               |
| 21   | 7                        | 72/F    | R                | 0               |
| 22   | 5                        | 55/M    | L                | 2               |

Abbreviations: UDysRS-III: Unified Dyskinesia Rating Scale part III; F: Female; M: Male; R: Right; L: Left.
Supplementary Table 2. Asymmetry index mean values of the brain region that showing significant differences of VMHC among three groups.

| Brain regions       | Asymmetry Index |     |     |     |     |
|---------------------|-----------------|-----|-----|-----|-----|
|                     | Dyskinetic      | Nondyskinetic | Controls | P values |
| IFC (pars triangularis) | 2.53 ± 0.39 | 2.06 ± 0.38 | 2.47 ± 0.36 | 0.640 |
| Pre-SMA             | 1.15 ± 0.17     | 1.03 ± 0.17 | 1.18 ± 0.16 | 0.804 |
| FFG                 | 1.65 ± 0.25     | 1.61 ± 0.25 | 1.55 ± 0.23 | 0.957 |
| MTG                 | 1.56 ± 0.26     | 1.82 ± 0.25 | 1.54 ± 0.24 | 0.672 |
| STG                 | 1.74 ± 0.24     | 1.22 ± 0.23 | 1.47 ± 0.22 | 0.291 |
| PoCG                | 1.23 ± 0.32     | 1.53 ± 0.31 | 2.07 ± 0.30 | 0.155 |
| SMA                 | 2.05 ± 0.29     | 2.00 ± 0.28 | 1.73 ± 0.26 | 0.682 |

Values are represented as the mean ± standard deviation. The significance of ANCOVA was set at p < 0.05. Abbreviation: IFC: Inferior Frontal Cortex; Pre-SMA: Pre-supplementary Motor Area; FFG: Fusiform Gyrus; MTG: Middle Temporal Gyrus; STG: Superior Temporal Gyrus; PoCG: Postcentral gyrus; SMA: Supplementary Motor Area.