

Assessing the Unterberger test: the introduction of a novel Application

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British Society of Neuro-Otology – 11 October 2013

Background

The Unterberger test is a commonly performed clinical examination used to assess peripheral vestibular function. Subjects are asked to march on the spot and their extent of rotation recorded. The sensitivity of this test is dependent on an assessor accurately estimating the degree of rotation. We therefore performed this study to compare estimates of rotation with a smartphone Application that accurately records rotation (D+R Balance).

Methods

Twenty five subjects were asked to estimate the degree of rotation of 10 successive Unterberger tests performed by a volunteer (Fig 1). Each test consisted of the volunteer taking 50 steps with their eyes closed whilst holding a smartphone running the D+R Balance Application (Fig 2). The volunteer was asked to deliberately rotate in either direction for each test and the Application was used to record the final degree of rotation.

Results

A wide range of estimates was obtained during each test. The overall average discrepancy in estimates was 27° from true degree of rotation, ranging from 9° to 53° (standard deviation 15°). Individual estimates varied by up to 147° from actual recorded values (Table 1).

Discussion

The Unterberger test and subsequently modified Fukuda test are part of the clinical assessment of the vertiginous patient. A significant degree of rotation during these tests is generally accepted to be between 30-45°. Our experiment demonstrates a wide discrepancy in observer estimation of degree of rotation, to the extent that a test may be considered falsely positive or falsely negative.

Conclusion

Observers poorly estimate the degree of rotation when using this clinical test, with discrepancy such that, if these results were to be applied in a clinical setting, they may lead to false positive or negative outcomes. These results highlight the need for a more robust method of measurement. The D+R balance Application provides an easily accessible and reliable method of recording rotation.

We therefore recommend the use of this Application or alternative objective methods of recording the degree of patient rotation to improve the accuracy conclusions drawn from clinical examination.



Figure 1. Volunteer performing Unterberger test

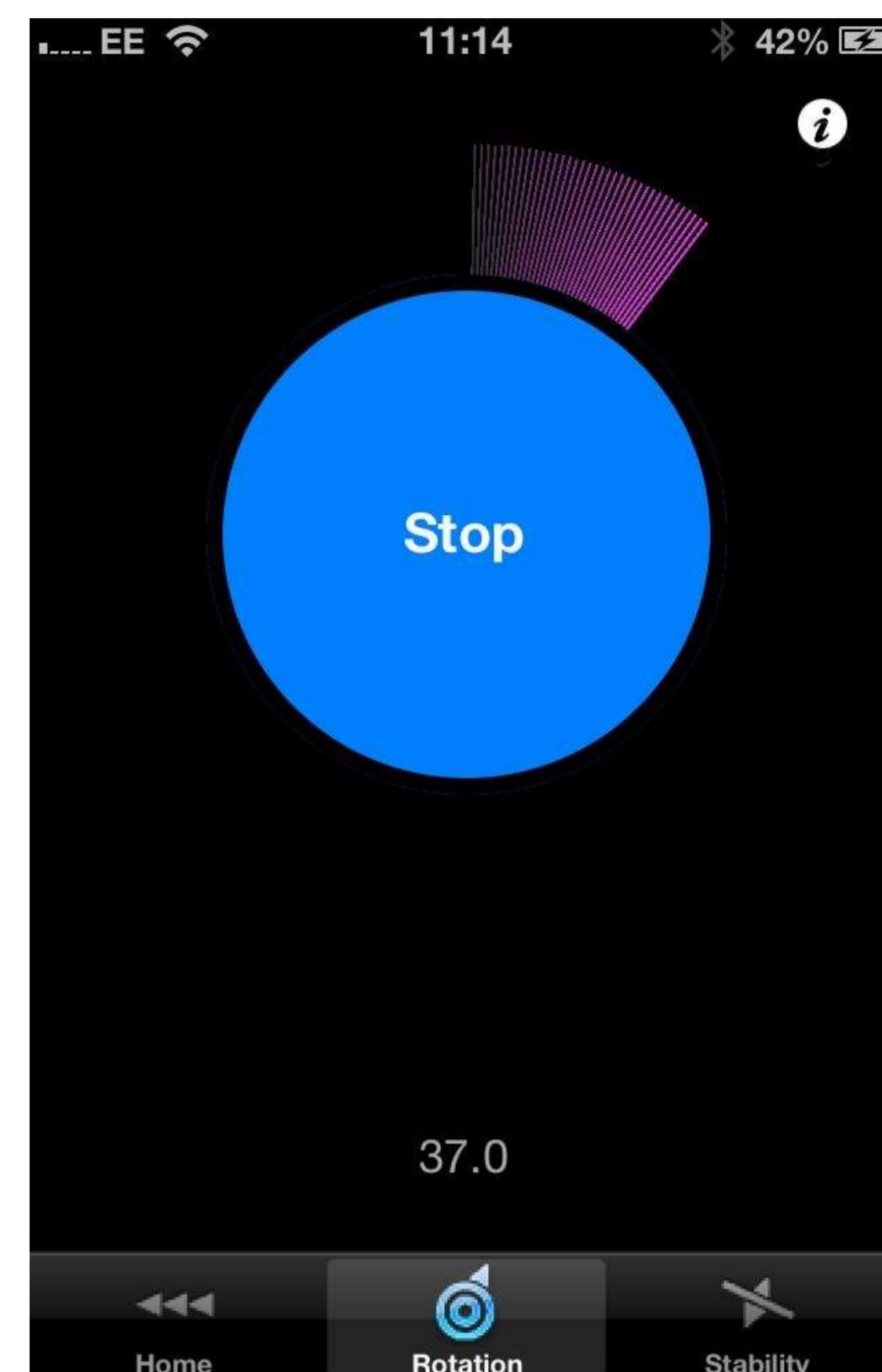


Figure 2. D+R Balance Application

Test	DR Balance	Mean Estimate	Min	Max	Mean Discrepancy
1	27	29	10	45	2
2	-89	-57	-85	-20	32
3	-18	-6	-51	5	12
4	62	48	20	80	14
5	116	85	30	130	31
6	-146	-109	-165	-55	37
7	28	24	5	40	4
8	-122	-73	-100	-25	49
9	157	97	10	150	60
10	-21	-11	-30	10	10

Table 1. Average results for each Unterberger test performed

References

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