DO PUTTERS WITH GROOVE FACE INSERTS PRODUCE PREFERABLE BALL ROLL CHARACTERISTICS?

Ashley K. Richardson, P. K. Thain and Andrew C.S. Mitchell

Sport, Health & Exercise Research Group, University of Hertfordshire, Hatfield, Hertfordshire, AL10 9AB, United Kingdom.

INTRODUCTION

Putting performance accounts for 43% of golf shots (Pelz, 2000). Putters have been developed with grooves or polymer inserts in the aim to hold the ball on the putter face for a fraction of a second longer, leading to a more efficient and effective strike. The main role of the grooves on a putter face is to improve the initial phase of the putt as the ball leaves the putter face, which is characterised by the ball skidding on the surface (Brouillette & Valade, 2008; Hurrion & Hurrion, 2002). This may contribute to the low value of 17% putts holed from 4-metres (Karlsen et al. 2008).

Grooves can reduce skidding by imparting more topspin on the ball increasing the ball's resistance to perturbations along the trajectory (Brouillette & Valade, 2008). Previously Brouillette (2010) has found putters with grooves to reduce skidding. The purpose of this study was to test the new brand of GEL® (GEL GOLF, Wan Chai, Hong Kong) putters which have a grooved insert against a putter with a traditional face. It was hypothesised that putts with the GEL® putter will have preferable ball roll characteristics in comparison to the traditional faced putter.

METHODS

All testing was completed in the Quintic Golf Laboratory with a surface registering 12 on the stimpmeter. A putting device was set up to simulate a 3.2 metre putt, with a straight-straight-straight swing path to ensure a square clubface during impact. A GEL® Vicis putter with 69° lie and 2.5° loft was used; the traditional faced putter was an Odyssey (Callaway Golf Europe Ltd., Surrey, UK) White Hot #3 with a 69° lie and 2.5° loft. Golf balls used were Srixon Z-STAR golf balls (Srixon Sports Europe Ltd., Hampshire, UK). Two Superline 2D lasers were used to ensure accurate positioning of the golf ball for each trial. The Quintic Ball Roll v2.4 Launch monitor (Quintic Consultancy Ltd, Coventry, UK) was positioned perpendicular to the putting line. One hundred putts were completed with each putter.

The data was verified to be normally distributed using the Kolmogorov-Smirnov test. Following this an Independent samples *t*-test between the GEL® and Odyssey putters was conducted between the following variables velocity, side spin, initial ball roll (IBR), forward roll (FR) and launch angle (LA). The alpha level was set at $P < 0.05$.

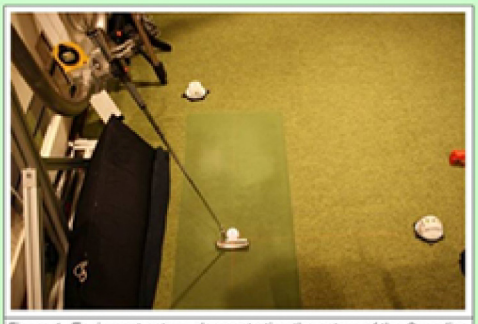

Figure 1. Equipment set up, demonstrating the set up of the Superline 2D laser lines and Quintic putting robot.

RESULTS

The GEL® putter demonstrated significantly preferable ball roll characteristics in comparison to the Odyssey putter. This is indicated in the values of IBR ($p < 0.001$), FR ($p < 0.001$) and LA ($p < 0.001$), without detriment to the velocity and side spin values. The Mean ± SD are displayed in Table 1.

Table 1. Mean kinematic variables for the GEL® and Odyssey putter. Significant differences observed for all variables ($p < 0.001$).

	Odyssey (mean ± SD)	GEL (mean ± SD)
Velocity (m/s)	2.11 ± 0.04	2.06 ± 0.04
Spin (rpm)	-6.15 ± 10.83	0.84 ± 12.82
IBR (rpm)	-18.67 ± 12.18	7.89 ± 13.78
FR (mm)	32.92 ± 24.64	10.95 ± 12.25
LA (°)	2.56 ± 0.35	1.48 ± 0.47

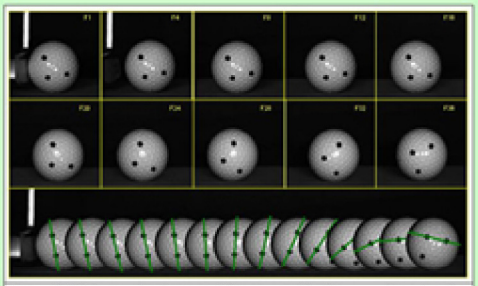

Figure 2. Pictures of subsequent frames and ball composite using the Odyssey putter demonstrating the ball roll.

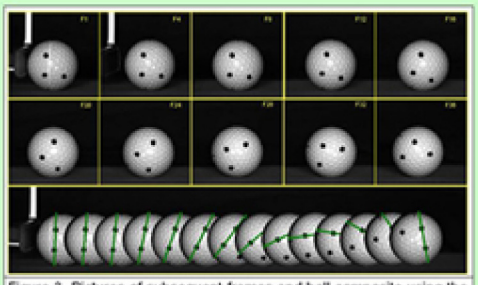

Figure 3. Pictures of subsequent frames and ball composite using the GEL putter demonstrating the ball roll.

DISCUSSION

The GEL® putter produced preferable ball roll characteristics by minimising the period of skid in comparison to the Odyssey putter. Initial Ball Roll (IBR) demonstrates the ball hit by the Odyssey putter to start with backspin, in comparison to forward or topspin with the GEL® putter (Figure 2 & 3). This is significant finding as it is directly linked with FR (the point which the ball is rotating forward), the GEL® putter demonstrated a lower figure than the Odyssey putter, again signifying reduced skid. Increased contact time between the putter face and ball as a result of the groove technology, putter shaft weighting and a difference in centre of mass location are proposed by GEL GOLF as possible reasons for the increase topspin during the impact phase. Reducing skid has previously been highlighted to increase resistance to perturbations along the trajectory (Brouillette & Valade, 2008), thus increasing the accuracy and therefore success rate of putts.

However, it is worth noting that too much topspin can be produced during the putter face and negative attack angle – ball interaction which will cause a negative launch angle. This in turn will cause the ball to 'bounce up'. In conclusion this study demonstrates that GEL® putters produce preferable ball roll characteristics in comparison to a traditional faced putter.

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University of Hertfordshire