



# Analysis of Attacking Actions in Professional Men's Padel

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## Abstract

This study examined the distribution of attacking actions in professional padel and their impact on the outcome of the match. The technical and tactical actions shot by shot (n=2,054) of four men's finals on the official World Padel Tour 2017 circuit were recorded by systematic observation. The results showed a solid distribution of shot use between pairs of players in the course of the point (~65% volleys, ~23% bandejas, ~12% smashes) and limited use of attacking actions to win the point (80% in <3 actions). The winners performed a higher number of attacking actions per match. Most importantly, the distribution of the number of attacking actions performed throughout the point was quantified and it was found that the winning pair completed 85% of points with one or more attacking shots and 64% featured fewer than three shots. These results confirmed the importance of volleys as the most used attacking action in professional padel and played more often than smashes. In addition, evidence was compiled about the limited number of strokes available to win a point at the elite level. These data may be useful in setting competition goals and designing tasks which dovetail with the needs of the game.

**Keywords:** racquet sports, performance, competition analysis, offensive actions.

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New Olympic Sports for Tokyo 2020. Climbing. Photo: Climbing. Asian Games 2018. Women's combined final. Competes Kim Ja-in from South Korea. Climbing leader. JSC Sport Climbing. Palembang, Indonesia. REUTERS / Edgar Su.

## Introduction

Although padel is a comparatively young sport at just over 40 years of age (Sánchez-Alcaraz, 2013), in recent years there has been an exponential increase in the number of its players to 5.9 % of sports practitioners in Spain (Courel-Ibáñez et al., 2017; Villena-Serrano, Castro-López, Lara-Sánchez & Cachón-Zagalaz, 2016). The reasons for its growing popularity include its social side as it is played by four players and learning its technical aspects is straightforward (Sánchez-Alcaraz, Courel-Ibáñez, & Cañas 2016); the fact that the points last a long time which allows the participants to enjoy themselves to the full (Courel-Ibáñez et al., 2018; Sánchez-Alcaraz, 2014; Courel-Ibáñez & Sánchez-Alcaraz, 2017); it is easily accessible for all sectors of the population because it is cheap; and the proximity of facilities where it can be played to where people live (Muñoz et al., 2016). This growth has also been reflected in the rise in scientific publications (Sánchez-Alcaraz et al., 2015), especially ones concerning performance analysis (Sánchez-Alcaraz et al., 2018). The purpose of performance analysis, also known as notational analysis and match analysis, is to observe, record and analyse the actions and behaviour of athletes in real game situations by compiling information with a high likelihood of transfer to the training field and analysing data from athletes via unprompted behaviour and real competition settings. This information is critical for planning more specific and effective training, designing strategies for better performance and improving decision-making and feedback rooted in behaviour (Garganta, 2009; Hughes & Bartlett, 2002).

One of the most studied aspects in padel and with huge practical applications for training is identifying indicators which enhance effectiveness in winning the point (Courel-Ibáñez et al., 2017; Courel-Ibáñez & Sánchez-Alcaraz, 2018). Previous studies have noted the importance of occupying and maintaining positions close to the net to increase the likelihood of success (Courel-Ibáñez et al., 2015; Ramón-Llin et al., 2013; Torres-Luque et al., 2015). These studies show that more than 80 % of winning points are earned at the net, with the volley being the most common shot accounting for 30 % of total shots in a padel match. This struggle for positions close to the net begins with the first shot of the point, the serve, since one of the features of padel is an immediate approach to the net after the service. Consequently, there is a continuous dichotomy during the course of the point in which the players who are at the net attempt to maintain this advantageous position (Courel-Ibáñez et al., 2017) while the players at the baseline try to regain it (Ramón-Llin et al., 2019).

Nevertheless, although previous studies have quantified the number and type of strokes per point in padel (García-

Benítez et al., 2016; Torres-Luque et al., 2015), there are no papers which have specifically examined the offensive actions of padel players and their impact on the outcome of the match. Since this type of action is performed in positions close to the net, this would make it possible to identify the technical and tactical actions which are most effective in maintaining the net position and therefore in increasing the chances of winning the point.

Hence the purpose of this paper was to learn the number and type of technical attacking actions which take place in professional padel and their impact on the final outcome of the match.

## Methodology

### Participants and variables

The sample included 2,054 technical and tactical padel actions in four men's finals on the official World Padel Tour 2017 circuit. Attacking actions were considered to be shots with no bounce made by the player offensively in a position close to the net (Courel-Ibáñez et al., 2017).

The recorded attacking actions were classified into four different strokes (Courel-Ibáñez et al., 2017), differentiating between ones performed by the winners and losers of the match:

Forehand volley: a stroke before the ball bounces which is performed by the dominant side of the player, usually near the net, with a short racquet swing from up to down, hitting the ball at head height.

a) Backhand volley: a stroke before the ball bounces which is performed by the non-dominant side of the player, usually near the net, with a short racquet swing from up to down, hitting the ball at head height.

b) Smash: a stroke before the ball bounces which is performed by the dominant side of the player, usually near the net. The shot is made with the player's arm extended above their head with a downward arm trajectory. It is a more attacking shot than the bandeja and is a flat shot.

c) Bandeja: a stroke before the ball bounces which is performed by the dominant side of the player, usually further away from the net. It is considered an intermediate shot between the smash and the forehand volley. It is a less attacking shot than a smash and has a slice.

### Procedure

Firstly, informed consent was sought from the Ethics Committee of the University of Grenada (No. 883). Next, the videos of the four World Padel Tour finals analysed were downloaded from YouTube®. The systematic observation of

the matches was carried out by two observers with a degree in Sports Science and more than four years of experience as padel coaches who were specifically trained for this task. At the end of the training process, each observer analysed the same set twice with the aim of calculating inter- and intra-observer reliability using Cohen's kappa coefficient, deriving values above .85 which is considered to be a very high degree of agreement ( $> .80$ ) (Altman, 1991). Specialised Lince software was used for data recording (Gabin, Camerino, Anguera, & Castañer, 2012).

### Data analysis

Frequencies ( $n$ ) and percentages (%) were calculated for each variable. Student's t-test was used to analyse differences in the distribution of actions by shot type between winners and losers. Subsequently, differences and interactions in the distribution of attacking actions by number of shots per point (nine categories, from 0 to more than 10) were identified through contingency tables and calculating the chi-square test. The strength of the relationships was interpreted using adjusted standardised residuals (ASR), considering values from 1.96 to 2.58 as small; 2.58 to 3.29 as medium; and more than 3.29 as strong (Field,

2017). The significance level was set at  $p < .05$ . All the data were analysed using IBM SPSS 20.0 for Macintosh statistical software (Armonk, NY: IBM Corp.).

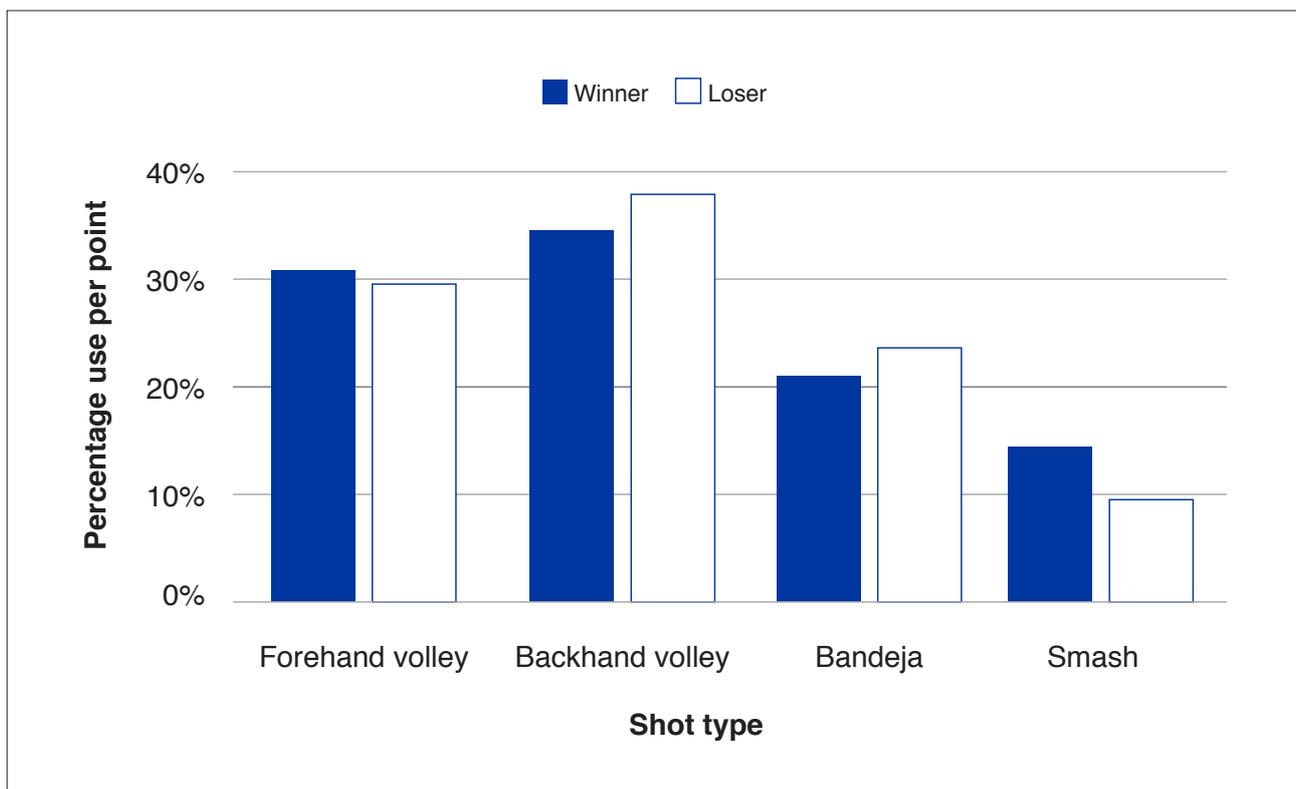
### Results

The winning pair performed a higher number of total attacking actions per match (327 vs. 186). The match winners also performed a significantly higher number of total attacking actions per point ( $F > 5.407$ ;  $p < .001$ ). However, a similar distribution was observed throughout the point, in which the volley was the most used action followed by the bandeja and finally the smash (Figure 1). This latter shot presented the greatest disparities as it was used 5 % more by the winners.

The results of the comparisons by number of actions per point (Table 2) showed differences between winners and losers of the match ( $X^2(6) = 54.920$ ,  $p < .001$ ). The winners performed one or more attacking actions in 85 % of points and in 50 % of cases only between one and two actions. By contrast, the losers failed to perform any attacking actions in 47 % of points. The biggest difference was observed in points with two actions with 14 % more cases in winners compared to losers.

Figure 1

Distribution of attacking actions by shot type between winners and losers of the match.



**Table 1***Distribution of game actions per point by the final result of the match.*

Result	Number of attacking actions per point										
	0	1	2	3	4	5	6	7	8	9 or more	
Winner	<i>n</i>	71	124	124	60	35	24	20	12	12	4
	%	14.2*	24.8*	24.8*	12.0*	7.0	4.8	4.0*	2.4	2.4	3.8*
	ASR	-11.2	1.5	5.9	2.1	1.8	1.5	2.1	1.4	.9	2.1
Loser	<i>n</i>	234	104	53	40	22	15	9	6	8	8
	%	46.9*	20.8*	10.6*	8.0*	4.4	3.0	1.8*	1.2	1.6	1.6*
	ASR	11.2	-1.5	-5.9	-2.1	-1.8	-1.5	-2.1	-1.4	-0.9	-2.1
Total	<i>n</i>	305	228	177	100	57	39	29	18	20	27
	%	30.5	22.8	17.7	10.0	5.7	3.9	2.9	1.8	2.0	2.7

\* Significance of chi-square test ( $p < .05$ ) and ASR > 1.96.

The division by shot type (Table 3) showed differences in the distribution of actions per point between winners and losers in all strokes: forehand volley ( $X^2(3) = 54.772$ ;  $p < .001$ ), backhand volley ( $X^2(3) = 38.452$ ;  $p < .001$ ), smash ( $X^2(6) = 17.071$ ;  $p < .001$ ) and bandeja ( $X^2(3) = 63.161$ ;  $p < .001$ ). The results show differences in the percentages of each type of shot. Firstly, the team winning the point performed more attacking actions per point than the losing team. Secondly, the winning team had a higher percentage in each type of shot in all attacking actions. Thus the forehand volley was the most used stroke in points where there was only one attacking action while the backhand volley was the most used stroke in points where there were two or more attacking actions.

The smash was more used by the winning team in one or more attacking actions.

## Discussion

The purpose of this paper was to examine the number and distribution of technical attacking actions in professional padel and their impact on the outcome of the match. As might have been expected, the players who performed the most attacking actions per point were the winners of the match. Hence and as previous studies have noted (Courel-Ibáñez et al., 2017; Muñoz et al., 2017), since these actions are executed in the attacking area of the court, players need to try to reach the positions close to the net

**Table 2***Distribution of game actions per point by shot type and the final result of the match.*

Shot type	Result		Number of attacking actions per point			
			0	1	2	3 or more
Forehand volley	Winner	<i>n</i>	244	168	53	23
		%	48.7*	33.5*	10.6*	4.6
		ASR	-7.2	4.4	4.1	1.7
	Loser	<i>n</i>	354	105	19	21
		%	70.9*	21.0*	3.8*	4.2
		ASR	7.2	-4.4	-4.1	-2.0
Backhand volley	Winner	<i>n</i>	238	149	69	45
		%	47.5*	29.7*	13.8*	9.0
		ASR	-5.9	2.9	3.9	1.9
	Loser	<i>n</i>	330	108	32	29
		%	66.1*	21.6*	6.4*	5.8
		ASR	5.9	-2.9	-3.9	-1.9

\* Significance of chi-square test ( $p < .05$ ) and ASR > 1.96.

**Table 2** (Continuation)

Distribution of game actions per point by shot type and the final result of the match.

Shot type	Result		Number of attacking actions per point			
			0	1	2	3 or more
Smash	Winner	<i>n</i>	238	149	69	45
		%	47.5*	29.7*	13.8*	9.0
		ASR	-5.9	-2.9	3.9	1.9
	Loser	<i>n</i>	330	108	32	29
		%	66.1*	21.6*	6.4*	5.8
		ASR	5.9	-2.9	-3.9	-1.9
Bandeja	Winner	<i>n</i>	330	115	31	25
		%	65.9*	23.0*	6.2	5.0
		ASR	-4.1	3.4	1.1	1.4
	Loser	<i>n</i>	387	73	23	16
		%	77.6*	14.6*	4.6	3.2
		ASR	4.1	-3.4	-1.1	-1.4

\* Significance of chi-square test ( $p < .05$ ) and  $ASR > 1.96$ .

during the padel point to increase their chances of winning the match. More specifically, the distribution of attacking shots showed that volleys are the most used offensive actions and played more often than smashes. These data are consistent with other studies which explored these same attacking shots (Carrasco et al., 2011; Courel-Ibáñez et al., 2015; Torres-Luque et al., 2015) mean  $\pm$  standard deviation:  $16.57 \pm 1.51$  years and with others which did not analyse the bandeja shot (Priego et al., 2013; Sañudo et al., 2008) varones de categoría nacional (edad, media  $\pm$  dt:  $16.57 \pm 1.51$  años).

One of the main innovations of this study was the provision of data on the number of offensive actions in the course of a point. It was observed that the winning pair of the match performed one or more attacking actions in 85 % of points. Furthermore, in 50 % of cases they performed only one or two attacking actions per point. By contrast, the losers failed to perform any attacking actions in 47 % of points. The biggest difference was observed in points with two actions with 14 % more cases in winners compared to losers. These data may be related to the limited duration of points in professional padel, which are usually shorter than 10 seconds (Courel-Ibáñez & Sánchez-Alcaraz, 2017; Torres-Luque et al., 2015). It is also important to note that one of the features of padel is the immediate occupation of offensive positions close to the net after the serve (Muñoz et al., 2016). However, recent studies suggest that the advantage of reaching offensive positions following the service lessens after 6-8 shots (Ramón-Llin et al., 2019). Hence these results seem to confirm that professional padel calls for players with the ability to win the point using a low number of attacking actions per point.

The results of this study have some limitations which should be borne in mind when interpreting its findings.

One is its small sample size, so it would be useful if future research could replicate this study in a larger number of players to substantiate its results. Furthermore, this paper only examined attacking actions and did not take into consideration other very important variables which may influence the outcome of a padel point or match. These include the prior sequence of actions (both offensive and defensive), the area of the court where the shots are made and their trajectory or efficacy. It is therefore suggested that future research should seek to include these types of variables in order to perform T-pattern analysis of padel actions.

The information gleaned in this study provides benchmarks which may be very helpful in evaluating the performance of padel players. These data will additionally be of great interest to sports trainers and padel coaches when designing exercises with more specific goals, training and strategies to meet the demands and requirements of professional padel. Finally, the importance of training offensive actions in padel, in particular volleys, can be confirmed along with training strategies or tactics to get up to the net in order to dominate the offensive initiative of the point for as long as possible.

## Conclusions

Volleys are the most commonly used attack shots in padel and played more often than smashes or bandejas. The pair which manages to perform the most attacking actions during the point has the highest likelihood of winning the match. However, most points (> 80 %) are settled using fewer than three attacking actions. This limitation needs to be taken into account when designing training plans and setting goals which meet the needs of competition.

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