



A novel analysis of grip variations on the two-handed backhand.

Doug Eng & Dave Hagler.

Lesley University, USA.

ABSTRACT

This article discusses the variations of grips used on the two-handed backhand. Subjects were the top 100 WTA and ATP touring pros and a qualitative, longitudinal analysis is presented. The concept of hand spacing gaps, precision and power grips were introduced in conjunction with more traditional description of grips. In addition, gender and individual differences are discussed.

Key words: Two handed backhand, Power grip, Precision grip.

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Corresponding author: Doug Eng, Lesley University, USA.

Email: deng@lesley.edu

INTRODUCTION

Due to the several possible placements of the hands, the two-handed backhand has many variations. Often students are taught to place the dominant hand at the bottom in either an eastern backhand or continental grip. The other hand is placed higher on the grip usually in the eastern forehand grip but there are variations using continental or western grips. Less attention is given to the top or non-dominant hand except the suggestion that the top hand dominates in 90% of cases and hence the eastern forehand grip should be used (Schönborn, 1999). Crespo and Miley (1998) discuss other grip variations and greater flexibility in hand dominance. McCullough (1984) discussed grip variations and consequences of grip on technical styles and topspin production. This article focuses on some of the subtle differences in grips that traditionally go unnoticed but may have significant effects.

RESEARCH METHOD

In this study, we examined the top 100 WTA and ATP players as of March 4, 2013 rankings. Among these players 96 WTA and 78 ATP players used two-handed backhands. Close-up high quality photographs of 5-8 strokes of each player were examined to verify consistency. Some players were found to vary grips depending on contact point, body position, and court position. In those cases, up to 8 photos were studied and the most frequently observed grips were considered normal for the player. Both authors independently verified the grips of all players to insure inter-rater reliability.

PRECISION AND POWER GRIPS

In examining the grips, it was found that there were 2 variations of the dominant or bottom hand. These grips were continental

and eastern backhand grips. In addition, the fingers were spread out in 2 variations. We define strong precision and regular precision grips in reference to how the hand and fingers are placed. If the index finger is well extended and there are visible gaps between at least two fingers, the grip was classified as strong precision. In a regular precision grip, fingers are closely placed without gaps, almost perpendicular to the length of the racquet, and with only a slight extension of the index finger.

The top hand or non-dominant hand had several variations that are classified in Figure 1. The two main variations are precision and power grips as originally define by Napier (1956). Precision grips have the thumb between the first two fingers where the thumb and first two fingers are almost pinching. Power grips place the thumb in the plane of the palm above the fingers, applying pressure opposite the fingers. Landsmeer (1962) discussed the grasping of a cylindrical object which is similar in shape to a tennis racquet grip. Figure 2 shows examples of both hands using a precision and power grip with the non-dominant hand. Finger pressure is applied differently with these grips.



Figure 1. Top hand grips. From left to right: precision eastern grip, thumb on fingers eastern grip, two power grip variations with fingers above top of grip.

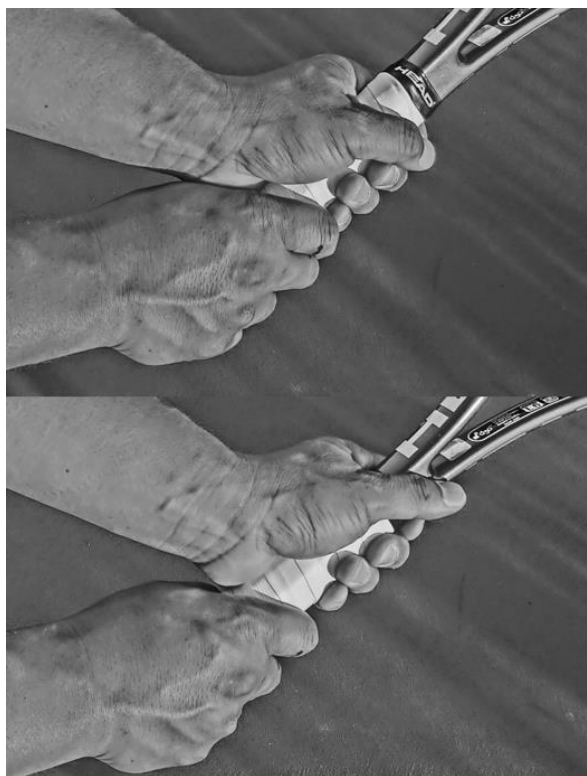


Figure 2. Two handed grip variations. Top: bottom hand using continental grip with top hand using precision eastern, Bottom photo: bottom hand using continental grip with top hand using eastern forehand power grip.

Table 1 summarizes the grip variations of the top 100 WTA and ATP players. The bottom hands were more similar than different. Women were more likely to use an eastern backhand with the bottom or dominant hand. Regardless, both ATP and WTA players most frequently used regular precision continental grips.

With the top hand, ATP pros don't seem to have a one predominant style. Although the eastern grip was used by 66 of the men, it was almost equally split between eastern precision with the thumb on the grip (see Figure 1), eastern precision with the thumb on the fingers, and the eastern forehand power grip. WTA players tend to use the eastern precision with the thumb on the grip itself. Having all fingers placed on the racquet is more common with the WTA pros than ATP pros. In Table 1, in green are precision grips which 78 (81%) of WTA players use but only 48 (62%) of ATP players use. In blue, are power grips which 30 (38%) of ATP players use but only 16 (17%) of WTA players use. Hence, men used power grips more frequently than women. It is important to note that despite trends among genders, players have some individuality.

Of interest is studying the gender difference in the usage of power and precision grips. Coaches are more familiar with gender differences regarding tactics and some strokes such as serves and one-handed backhands. It is possible that grip differences may affect technique and even tactics.

TWO-HANDED GRIPS			
	ATP	WTA	TOTAL
BOTTOM HAND			
Continental Strong Precision	13	15	28
Continental Regular Precision	58	63	121
Eastern Backhand	7	18	25
TOP HAND			
Continental Precision	4	14	18
Eastern Precision, thumb on grip	19	45	64
Eastern Precision, thumb on fingers	25	19	44
Eastern Power	22	8	30
Semi-Western	5	8	13
Continental Power	3	0	3
Number of Players in Top 100	78	96	

Table 1. Grip variations of the top 100 WTA and ATP players.

HAND SIZE AND GRIPS

Table 2 shows some measurements of placement of the hands. One measurement was the spacing or gap between hands. Some 49% of ATP and 53% of WTA lacked a gap. The placement of the top hand near the tape of the grip (or overgrip) was also measured. The majority of WTA players (68 or 71%) were below the tape but only 22 (or 28%) of ATP players had the hand below the tape.

Essentially, men generally lack a gap between the hands and the top hand was placed on the tape. Simply put, the length of the grip may be too short for many men. Women, with smaller hands, were able to place both hands on the racquet below the tape. They didn't run out of space on the grip.

The fact that WTA players still had space on their grips, may have contributed to their greater tendency to use precision grips compared to ATP players. Some 45 of the women were able to use the eastern precision grip with the thumb on the racquet (see Figure 1a, second photo from the left). ATP players

ran out of space on the grip so the top hand often went on or above the tape. In addition, the thumb was often placed on the fingers or above as in the power grip. Lack of grip space may result in many ATP pros grasping the racquet with fingers closer together. The closer fingers tend to promote power grips. On the other hand, WTA players were able to spread their fingers more comfortably and use precision grips allowing the fingers to spread.

HAND PLACEMENT			
	ATP	WTA	TOTAL
GAP BETWEEN HANDS			
No Gap	38	51	89
Gap 0-1 inch	39	36	75
Gap 1-1.5 inch	0	3	3
Gap more than 1.5 inches	2	6	8
TOP HAND PLACEMENT			
Below top tape	22	68	90
On top tape	34	15	49
Above top tape	23	13	36
Number of Players in Top 100	78	96	174

Table 2. Measurements of placement of the hands.

TECHNICAL CONSEQUENCE

Because men use power grips more than women, they may be more left-hand dominant. However, another factor is the grip of the bottom hand so the left hand grip may not exclusively determine dominance. The power grips allow ATP players to apply different and more pressure with the left hand, increasing tension and rigidity of the arm. Hence, less bending of the wrist and elbows may occur with ATP players during the swing. This grip style might help contact on high balls and apply greater spin.

One of the differences seen in Table 1 was the use of the continental precision grip with the top hand. Only 4 men used this grip compared to 14 women. The continental precision grips among women may make it more difficult to hit heavy topspin. The continental grip places hands, elbows and arms closer together. That effect may reduce left-hand dominance but promote synchronous use of both arms. It has been noted that wrist injuries are more frequent among female tennis players with the suggestion that females rely on the left hand more (International Tennis Performance Association, 2012).

The rare continental power grip was used by only ATP players, namely three of the tallest players (Del Potro, Isner, and Raonic). Although it can be viewed as similar to the continental precision grip, it has key differences. First, the tall players

naturally have contact points lower than for the average-sized player. Second, the power grip tends to make the arms more rigid and straight. As a result, Isner can naturally play a relatively low ball with straight arms.

The ATP power grips make the non-dominant hand more rigid. That may allow the top hand to overtake the bottom hand in a push-pull stroke. In essence, that means, the top hand pushes forward with much greater forward velocity than the bottom hand which may even decelerate. That could be helpful on wide balls and high balls. The top hand could also push more easily upwards to increase spin.

Having a gap between the hands may increase stability on some shots and increase maneuverability on other shots. However, particularly with larger gaps, leverage with the left arm is sacrificed in exchange for more control. There appears to be no meaningful difference between genders in gaps.

CONCLUSION

There are subtle differences with the grips on the two-handed backhand that are traditionally ignored. It is important to note that differences are both individual and gender-based.

It is likely that racquet manufacturers make the grip too short for the modern ATP player. A manufacturing change in grip length might affect the top hand grip and gap between hands. Forty years ago, the two-handed backhand was less common and athletes were generally smaller. Today's ATP players are often 6'1"-6'5" and two-handed backhands are the norm. The use of both hands and larger hands on smaller grips have changed the grips favored by both genders, especially the men. In turn, the grips have influenced technical changes. Coaches should also recognize precision and power grips which may be taught as variations or in conjunction with traditional continental, eastern and western grips. Coaches should allow players to experiment with different grip combinations while recognizing technical advantages and disadvantages.



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