

ONE-HANDED BACKHAND DRIVE:
A VIDEO ANALYSIS



MARK PHILIPPOUSSIS

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INTRODUCTION

The following is a video analysis of a right-handed player, Robert Ammon, performing a one-handed backhand drive. Although all of the observations and comments refer to a right-handed player they can easily be adapted to facilitate a left-handed player. Following a brief definition, the skill of hitting a one-handed backhand drive is divided into four phases: preparatory, wind-up, force generation, and recovery. Each phase is then further divided into its key elements. Concluding will be an outline of what can be done to encourage any corrections identified in the video analysis. To assist in the video analysis, I have included an eight-frame video collection of myself as well as a skillful player, Mark Philippoussis, performing a one-handed backhand drive, for comparison.

DEFINITION

The backhand stroke is used to return balls that bounce to the left (non-racquet) side of the body—right-handed player. It consists of a horizontal swing, which imparts some action on the ball sending it forward to land near the desired target—[depends on tactics] (Driver, 1964, p. 70).

PREPARATORY PHASE

The preparatory phase includes several key elements: the grip, non-racquet hand, movement to the ball, and racquet preparation.

THE GRIP



Figure 1

An eastern backhand grip is recommended for the one-handed backhand drive. The wrist is positioned behind the racquet so that control and power are both possible at impact. Reference points, see Figure 1: Base knuckle of the index finger is on top of the handle, the thumb placed diagonally across the back of the handle, "V" of the hand intersects line 8. Palm is parallel to the ground. Fingers spread, butt end of handle just out of the hand (TennisOne, 1995).

NON-RACQUET HAND

The non-racquet (left) hand should be placed on the throat of the racquet above the right hand. Its main purpose is to aid in the adjustment of the grip, and to pull the racquet back during the backswing. From a mechanical point of view the non-racquet hand act as a stabilizer and helps to load the racquet. The loading of the racquet involves the storing of kinetic energy generated during the backswing. By holding the racquet very close and tight to the body, the amount of force that can be generated at contact with the ball is increased.

MOVEMENT TO THE BALL

During the preparatory phase the athlete moves to a position where he/she is able to hit the ball. This position should be to the right of where the ball will bounce—right-hander. It is extremely important that the athlete moves to this position prior to the ball contacting the ground.



Figure 1—Mark Philippoussis

As seen in Figure 1, Mark has his non-racquet hand on the throat of the racquet and has adjusted his grip accordingly. He has also started to move his body to the left in preparation for his backhand drive. Notice that his weight is mostly on his right foot which is in contact with the ground. This allows him to push off his right foot in order to move in the opposite direction (action reaction forces).

In contrast, Figure 1a. shows Robert as he prepares for his backhand drive. Notice that his knees are slightly bent and both hands are on the racquet. However, he is not square to the net and is leaning slightly back on his right foot. By pushing back into the ground with his right foot, Robert position can be corrected. This simple adjustment will enable him to be better balanced during this phase; balance equals power.



Figure 1a. —Robert Ammon

RACQUET PREPARATION



Figure 2—Mark Philippoussis

In Figure 2 Mark has begun to shift his weight onto his left foot. By putting his weight onto his left (back) foot, he is loading this lever in preparation for his next movement—forward to the ball. Notice also that Mark’s racquet is very tight to his body, which will help in the amount of angular momentum—rotational force, he is able to generate when hitting the ball.

When looking at Robert’s body position, we see that his left shoulder is slightly turned away from the court. This is good because it allows him to prepare quicker when bringing the racquet back; however, his overall body position is quite erect (see Figure 2a). Also, he has his weight evenly distributed on both feet, which makes it more difficult to create any kind of power during his backhand drive. To be fair, Robert’s body position is as a result of having to run into the preparatory position prior to making his shot.



Figure 2a. —Robert Ammon

WIND-UP PHASE

The wind-up phases consist of two key elements: body position and racquet position.

BODY POSITION

The body should be at a right angle to the net with the right foot leading into the court and the left foot planted and close to the right foot. The upper body rotates away from the net to accommodate the backswing, which is across the body (Driver, 1964, p. 71). It is extremely important for the athlete to pivot both the shoulders and hips as the ball leaves the opponent’s racquet. The athlete should be looking over his/her shoulder while moving to the ball.



Figure 3—Mark Philippoussis

Notice in Figure 3 that Mark's body position is perpendicular to the net. He is looking over his right shoulder, which is in line with the path of the ball. Also notice that Mark's weight is now on his back foot as he brings the racquet back. This allows him to transfer his power to his front foot and consequentially into his backhand drive.

Robert position is fairly good in this phase (see Figure 3a). He is perpendicular to the net and his racquet is back in preparation to hit the ball. However, his knees should be more bent, and his shoulders and hips should be rotated more away from the court to allow his back to face the net. Also, Robert will have to transfer his weight from his back foot (left) to his front foot (right). This will be much easier if he is in a set position with his weight on his back foot.



Figure 3a. —Robert Ammon

RACQUET BACK POSITON

The key to the backswing is to get the racquet back as soon as possible. From the ready position take the racquet back keeping it right next to your body; this takes less time to get the racquet back. The racquet is thrown back behind the left hip, elbow relaxed and wrist adducted (Driver, 1964, p. 72). A circular (see Figure 4) or straight backswing may be used, the latter preferable for beginners. The racquet should be lined up directly behind the on-coming ball.



Figure 4—Mark Philippoussis

Notice in Figure 4 that Mark's racquet is slightly above his left shoulder. He has also taken a step towards the ball with his right foot, which leads into the next phase. The above describes the biomechanical process of coiling your body on the backswing which includes four distinct steps in its kinetic chain: 1) you take your arm back, 2) rotate your shoulders back, 3) turn your hips and bend your knees, and 4) flex your ankle (Brody, 1987, p. 70).

Similarly, we see that Robert has taken a step towards the ball with his right foot (see Figure 4a.). However, his body position is still too erect, which will not allow him to complete an effective under and over motion—topspin. By keeping his knees slightly bent, Robert will lower the position of his body and in turn his racquet. Also notice that Robert’s racquet is not starting from a point farthest from his point of contact. This will result in considerably less potential energy. Robert should bring the racquet back quickly and as far as possible while rotating his shoulders and hips. This will allow him to generate more potential energy.



Figure 4a. —Robert Ammon

FORCE GENERATION PHASE

The force generation phase consist of two key elements: stepping into the ball and racquet forward position.

STEPPING INTO THE BALL

The body and the racquet must move forward and upward together. This is accomplished by beginning the forward movement simultaneously with the step of the front foot and the push of the back leg (see Figure 5). The athlete should step across the body and forward, attacking the ball (Elliot & Kilderry, 1983, p. 22).



As seen in Figure 5, Mark position is ideal. He has transferred his weight from his back foot (left) to his front foot (right), and has adjusted his body segments to generate the maximum amount of force at contact with the ball. Also notice that when Mark steps across to his body, he remains very low. By staying low to the ball he is able to extend through his ankles, legs, hips, shoulders, and arm, when striking the ball.

Figure 5—Mark Philippoussis

In contrast, Robert position is not ideal (see Figure 5a.). First, his body position is not low and compact. This will prevent him from generating maximum force when hitting the ball. However, Robert has transferred his weight onto his front foot (right) and is moving forward toward the ball. Unfortunately, he will not be able to take full advantage of his weight transfer because of his previous errors.



Figure 5a. —Robert Ammon

RACQUET FORWARD POSITION

It is important to adopt a closed stance to enable the racket path to be flattened in the area of ball contact. The direction of the hips and shoulders will generally dictate the direction of the shot. The arm should be kept straight and the wrist fixed creating a long lever as the ball is hit (Elliot & Kilderry, 1983, p. 22).



Figure 6—Mark Philippoussis

Again, Mark's mechanics are ideal (see Figure 6). In its totality, we see the biomechanical process of uncoiling your body on the forward swing. The uncoiling process utilizes all of the elastic energy that was stored in the previous wind-up phase and produces a great deal of momentum. In this uncoiling process, it is very important to stay in contact with the ground in order to have greater stability, which allows you to take advantage of the ground reaction force created.

Notice in Figure 6a. that Robert's racquet forward action has caused some breakdowns in his overall mechanics. First, Robert's racquet arm is not straight which makes it difficult to create maximum angular velocity. Second, at the point of contact with the ball, Robert has brought his shoulders up which in turn causes his head and racquet to rise. To correct these errors, Robert needs to concentrate on keeping his knees bent and shoulders slightly forward



Figure 6a. —Robert Ammon

over his right knee throughout his backhand.

RECOVERY PHASE

The recovery phase consist of two key elements: racquet path and body position.

RACQUET PATH

The racquet should continue on a path from low to high, with the racquet head at a constant angle. You should finish above your right shoulder (see Figure 7), to create ball lift over the net (Elliot & Kilderry, 1983, p. 22). Really feel your racket head lifting through the ball in the direction in which you are aiming. Maintain your racket face angle in the high follow through.



Figure 7—Mark Philippoussis

Notice in Figure 7 that Mark’s racquet arm (right) is rotated outward so that the racquet face is slightly closed. This creates addition action on the ball prior to it leaving the racquet and as a result produces kinetic energy during the follow through. Also notice that his racquet finishes in the opposite position as described at end of the wind-up phase. It is important to note that Mark’s racquet path is entirely independent to the direction he hits the ball.

Figure 7a. illustrates the whole story. Robert’s racquet path is vertical rather than horizontal. This will result in the ball travelling with a great deal of upward angle. We also see that the racquet angle after contact is flat which causes the ball to travel long. On a positive note, Robert does finish with the racquet high above his right shoulder, which indicates a good start to his follow through action. Realistically, Robert needs to fix things in the previous phases in order to have correct mechanics at this point—see previous corrections.



Figure 7a. —Robert Ammon

BODY POSITON

The head should be kept down during the recovery phase. This will keep your body from becoming too open while finishing the shot. Stay down on the shot by keeping your weight forward over your front knee—slightly bent (see Figure 8). Your non-racquet arm (left) and back foot act as a stabilizer, which adds balance to your follow through.



Figure 8—Mark Philippoussis

Notice in Figure 8 that Mark stays sideways throughout the stroke, which allows him to recover to a ready position, facing the net. Also, observe that his body remains low after he hits the shot, which helps him to react to the next shot by his opponent.

As seen in Figure 8a., Robert's body position is a little awkward. First, his stance is slightly open which diminishes the effectiveness of his follow through. Second, Robert's position is not low after contact with the ball; a recurring theme. As discussed previously, if he does not remain low, he will not be able to generate sufficient power through his backhand drive. Finally, Robert's head raises as his racquet moves through the forward swing. Again, this will cause his upper body to rise (see Figure 8a.) which reduces the amount of force that can be transferred into his backhand drive.



Figure 8a. —Robert Ammon

RECOMMENDATIONS FOR IMPROVEMENT

What can Robert do in order to encourage the corrections that have been identified: hitting zone and early preparation.

In order for Robert to improve his contact point with the ball—hitting zone, he needs to concentrate on taking a step forward towards the target and reaching forward to contact the ball. Robert should force himself to move toward the ball rather than letting the ball move towards him. By concentrating on the ball as it leaves his opponents racquet, Robert is able to see the ball all the way to his racquet whereby increase his ability to contact the ball well out in front of his body.

Early preparation is needed in order to accomplish the above goal. When practicing, Robert needs to force himself to concentrate more on the moment the ball leaves his opponents racquet. By focusing on the point the ball contacts the racquet, Robert will have a cue indicating when to split step; a key component in preparation. Robert should also concentrate on the racquet back phase which should occur shortly after the ball is struck by his opponent. By saying “*racquet back*” just after the ball is struck, Robert will be able to train himself to know when the appropriate time is to bring his racquet back, thereby creating more time and greater success.

CONCLUSION

Having an effective one-handed backhand take a tremendous amount of practice. As you can see from the comments and suggestions made throughout this report, Robert's mechanics need some improvement. However, he should be encouraged by the fact that his errors are isolated to two specific areas: hitting zone and early racquet preparation, specifically split step. Hopefully through this video analysis of his stroke and an effort on his part to improve there is hope. However, it is not good enough just to practice hitting the ball hundreds of times. Instead, it is absolutely important to practice exactly what it is you want to achieve during a real game situation. Only then will you be able to accomplish your goals. As a great coach once told me, “*practice does not make perfect, perfect practice makes perfect.*”

References

Brody, H. (1987). Tennis Science for Tennis Players. Pennsylvania: University of Pennsylvania Press

Driver, H. I. (1964). Tennis for Teachers. Madison, WS: Monona-Driver Company

Elliott, B., & Kilderry, R. (1983). The Art and Science of Tennis. New York: The Dryden Press

TennisOne (1995). *Get a Grip* [Electronic version]. Retrieved November 8, 2001, from <http://tennisone.com/Misc.520Pages/grips/backhand.htm>