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Forehand Groundstroke Tennis; Movement Analysis for Beginning Players

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Abstract: ***This study aims to determine the general mistakes made by beginner tennis players when doing forehand groundstroke techniques in tennis. This needs to be done so that the player does not make a permanent mistake in the movement because they do not understand what is wrong with the movement that was done. By doing the right technique you will be able to hit the ball more consistently and also stronger. This research was conducted on beginner tennis players aged 19 ± 2 years who have done exercises > 30 times. Samples of university students doing physical activities every day. Movement analysis is carried out by referring to three indicators namely (1) back swing, (2) forward swing and (3) follow through. There are 17 sub-indicators that make up the three indicators. Besides that, the accuracy and power of the stroke are also analyzed using the forehand groundstroke instrument. The results showed that the truth of the movement of beginner tennis players to do forehand groundstroke is only 65.9% consisting of 67.7% on back swing, 70.7% on forward swing and 48.7 on the follow through. In the placement of the forehand groundstroke 23.8% of the ball is placed at point 1, 18.2% of the ball is placed at point 2, 14.1% of the ball can be placed at point 3 and 12.6% of the ball can be placed at point 4 whereas the rest of the ball failed to enter the court at 31.3%. In the power groundstroke forehand, beginning players hit the ball falling in zone 1 by 9.2%, in zone 2 by 18.7% and in zone 3 by 40.8% while the rest of the ball did not enter or involve on the net at 31.3 %. Beginner players and coaches also need to pay attention to every movement of the back swing, forward swing and follow through because it is the key to the success of hitting the ball both for accuracy and power of strokes.***

Keywords: ***Tennis, Forehand Groundstroke, Movement Analysis.***

1. Introduction

Tennis is one of the competitive sports that has been in great demand by all ages who can move[2][2]. People who choose to play tennis appear to have significant health benefits, including improved aerobic fitness, a lower body fat percentage, a more favourable lipid profile, reduced risk for developing cardiovascular disease, and improved bone health [1].

Tennis competition has many levels where the highest level is Grand Slams. With the tiered competition will certainly build the desire of each tennis player to excel, so they can show their identity. To be able to play tennis, you must master the basic techniques of playing tennis, namely the forehand groundstroke, backhand groundstroke, service, overhead and volley[5][4]. In addition to mastering playing techniques, players must also be able to assemble each technique into a playing tactic that is supported by good physical condition when competing. Perfection in playing technique becomes an absolute mastery for every tennis player because the player not only hits the ball one or two times, but the player will hit the ball throughout the game so the player must be able to maintain consistency in making the right shot during the match.

Forehand groundstroke is one of the most frequently used strokes in tennis[8][8][8]. This stroke is hitting a ball after bounces with the dominant hand. Every tennis player certainly hopes to have a perfect forehand groundstroke because it can be a weapon used to generate points or put pressure on the opponent's defense during a match. To be able to do a perfect groundstroke forehand certainly requires proper analysis so that errors in each movement can be corrected.

Every player, especially beginners, have to understand the steps to make a forehand groundstroke. This understanding helps tennis players' correct mistakes in the movement. Many tennis players point out permanent mistakes when competing so that the pattern of the game is very inefficient which will result in a lot of effort. To overcome this, of course, an understanding of every movement during a forehand groundstroke must be known by every tennis player and even the coach so that they can do the right technique both during training and during matches.

2. Objectives of the Study

Forehand groundstroke is a shot that is done with open arms after the ball bounces. Forehand groundstroke effectiveness is important for tennis success[7][7][3]. This is the stroke most often used by players during a match especially in a singles match. The development of the game of tennis now is that players hit the ball from the base line by relying on the speed and power of the strokes so that they can generate points and win matches. To be able to hit the ball stronger and faster than the back line requires the correct technical treatment.

The forehand groundstroke is done with 6 steps, namely making splitstep, turn back foot in the direction of forehand side.(2) Make a small bouncy side-step to your other foot. At the same time, start the backswing. (3) Keep the weight back and rotate the shoulders as making your step and backswing. (4) Bend the legs as stepping out to the side. Use an open stance. (5) Transfer all the weight onto front of leg and start

your forward swing. And (6) Make an accelerated low-to-high swing into contact, and rise up to help following through[6][4]. In making a forehand, in general there are three important things that need to be considered by each player, namely preparation and back swing and contact, forward swing, and follow through[3][3]. Of course the three movements have important points that need to be considered by every player to achieve perfection of movement.

3. Research Methods

Descriptive analytical research method is used in this study. There ara 39 students who participated in this study. All samples are beginner tennis players with age around 19 ± 2 years. Samples are university students who do physical activities every day and have done tennis exercises more than 30 times. This study uses a survey method by analyzing the ability of the sample to conduct a forehand groundstroke. Three cameras are used to record samples when conducting a forehand groundstroke test from the left side, right side and also from the back side. Each sample is given 10 times the chance to do a groundstroke forehand, which aims to measure the ability of the groundstroke, both the placement and power of the groundstroke forehand in tennis[4].

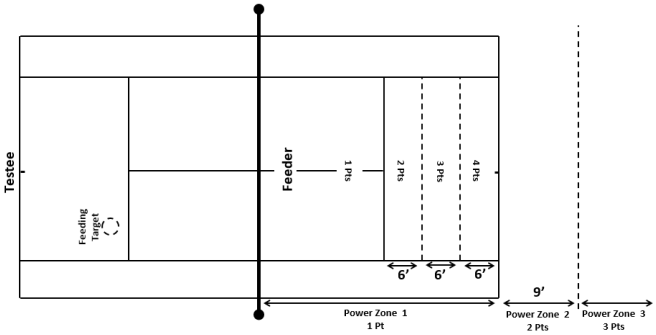

Figure 1: Groundstroke forehand test (Larry Hansley)

There are 3 indicators with several sub-indicators used to analyze each forehand groundstroke technicue. Samples that make these movements correct will be given a value of 1 while those who are incorrect will be given a value of 0. The sub indicator are (1) preparation and backswing; (a) Eastern, semi western or western grip, (b) For better anticipation, it's important to watch the ball, (c) Keep the knees slightly bent, ready to move off in any direction, (d) the shoulders and trunk are rotated following the pull of the racket backwards, (e) The racket head is up and the face of the racket is outward. (2) forward swing and contact; (a) Keep the eyes watching the ball moving, (b) used close stance, semi-open or open stance, (c) hyperextension of wrist followed by a racket in contact, (d) Shoulders and trunk rotate when hitting the ball, (e) Hit the ball in middel level (hitting zone), (f) hit the ball with raket in the right range, (g) As you swing around, transfer most of your body weight onto your front leg in order to power the swing, (h) the racket is swung from the bottom up in the direction of the ball, (i) Pronation movements occur on the elbow. (3) follow through; (a) The racket is swung fully to the other side of the shoulder, (b) The shoulders are rotated following the racket swing until straight facing the net, (c) the other hand moves dynamically following the racket's movements.

4. Result and Discussion

The results of the study show that the truth of beginner tennis players in conducting forehand groundstroke is 65.9%. This is composed of the correctness of movement in preparation and backswing at 67.7%, forward swing and contact is 70.7% and follow through is 48.7%. Backswing needs to be done to prepare player to be able to hit the ball harder and also most importantly be able to control the ball. The forward swing and contact the ball becomes the core of the forehand groundstroke because the success of this stroke is determined by this movement. Proper recognition with the right angle will result in the ball entering, leaving the field or even involving on the net. While the follow through serves to maximize the transfer of power and also to direct the ball in accordance with the wishes of the player.

There are 5 sub inidikotro for preparation and back swing, they are (1) the player uses one grip between eastern, semi western or western at 89.7%. Grip becomes an important thing in doing the forehand groundstroke technique in which to be able to hit the ball properly certainly requires correct handling as well. In the development of modern tennis grips that are used in general are eastern, semi western and western. (2) For better anticipation, it's important to watch the ball at 100%. It is important for the player to pay attention to the ball before hitting it so that it knows the direction of the ball hit by the opponent. This will also affect the movement of players towards the left, right or towards the front of the playing field. (3) Keep the knees slightly bent, ready to move off in any direction is 69.2%. keep the knees bent will provide readiness and also maintain a position so that the ball is hit in the punch zone so the ball can be hit properly. Unpreparedness of players in hitting the ball will make it difficult for players to aim the ball even if the ball being hit cannot hit to the tennis court. In this movement novice players still tend not to do it right so it needs to be considered both by the player himself as well as the coach. (4) The shoulders and trunk are rotated following the pull of the racket backwards of 48.7%. Pulling a racket by turning your shoulders and trunk back will make it easier for the player to swing the racket when hitting the ball because by doing this movement the ball can be hit harder because the swing forehand movement will be wider. For beginning players who make this move only by 48.7% should be a matter of special attention to both the coach and the player itself. (5) The racket head is up and the face of the racket is outward is 30.8%. This movement is done to prepare to hit the ball, body and racket in the right position so that it can produce the right punch. Beginner tennis players need to pay attention to this movement because one permanent mistake is in this movement. Many tennis players who have been playing tennis for a long time have ignored this move so that their punches have become imperfect.

Table 1: Movement analysis on preparation and backswing

No	Sub Indicators	%
1	Eastern, semi western or western grip	89.7
2	For better anticipation, it's important to watch the ball	100.0
3	Keep your knees slightly bent, ready to move off in any direction	69.2

4	the shoulders and trunk are rotated following the pull of the racket backwards	48.7
5	The racket head is up and the face of the racket is outward	30.8
Preparation ang Backswing		67.7

On the ball hitting movement namely (6) Keep the eyes watching the ball moving is 100%. This is necessary so that the player does not lose controling the ball when hit with a racket because the ball rotates so that it can change direction after the ball bounces. (7) used close stance, semi-open or open stance is 69.2%. The position of the legs close, semi-open and open stance is a standing position which is done by the tennis player when hitting the ball. Outside of that position is an unusual standing position so novice players need to familiarize themselves with the standing position. (8) hyperextension of wrist followed by a racket in contact is 69.2%. This movement needs to be done to provide more power to the ball at the time of the imposition and also to increase control of the incoming ball. Beginner players who do this movement are still very few, so it needs to be understood and done to perfect the movement. (9) Shoulders and trunk rotate when hitting the ball is 48.7%. This movement is carried out in rhythm with the movement of the racket when hitting the ball. Beginner players must understand that shoulder movements ranging from pulling a racket up to advanced movements are very helpful in controlling the ball and can also increase the speed of the stroke by making the racket swing faster. (10) Hit the ball in middel level (hitting zone) is 94.4%. Hitting the ball in the correct zone will certainly make the punch more effective because full force can be transferred to the ball. There are still many beginner tennis players who hit the ball in uncontrolled zones such as over the shoulder so that it will not hit the ball optimally. (11) hit the ball with raket in the right range is 94.9%. This position determines the success of the ball being hit in the right direction. Because hitting the ball in this position the player can direct the ball both towards the opponent's backhand and towards his forehand. (12) As you swing around, transfer most of your body weight onto your front leg in order to power the swing is 30.8%. To add power to the punch and also control the ball in the direction specified the player needs to squat and stretch his leg back when hitting the ball[6]. Novice players need to practice this move in order to increase their ability to take shots that are more directional and stronger. (13) the racket is swung from the bottom up in the direction of the ball is 94.9%. One technique used to control the direction of the ball is to swing it stickily in the direction the ball will be hit. With this technique the ball will experience a top spin so that the chance of entering the opponent's playing field is greater (Rolf Flitchbeil 2006. There are still novice tennis players not doing this so that the ball hit is not in the desired direction. (14) Pronation movements occur on the elbow is 33.3%, the pronation movement when hitting a ball will have a top spin effect on the ball, the top spin needs to be done to control the ball into the playing field, the professional players use this technique to recognize a fast ball so that it can remain hit the opponent's ball hard and also still be able to control the direction of the ball.

Table 2: Movement analysis on forward swing and contact

No	*Sub Indicators*	*%*
6	Keep the eyes watching the ball moving	100.0
7	Used close stance, semi-open or open stance	69.2
8	Used close stance, semi-open or open stance	69.2
9	Shoulders and trunk rotate when hitting the ball	48.7
10	Hit the ball in middel level (hitting zone)	94.9
11	Hit the ball with raket in the right range	94.9
12	As you swing around, transfer most of your body weight onto your front leg in order to power the swing	30.8
13	The racket is swung from the bottom up in the direction of the ball	94.9
14	Pronation movements occur on the elbow	33.3
Forward Swing and Contact		**70,7**

On the follow through (15) The racket is swung fully to the other side of the shoulder is 69.2%. Many beginners do not do this move even though it will cause a lot of losses. It is can result innjury because the transfer of energy is not optimal, can not control the ball and cannot hit the ball harder. So that in novice players this movement must be mandatory to do. (16) The shoulders are rotated following the racket swing until straight facing the net is 28.2%. Many beginner tennis players only swing their shoulders so they are level with the net. This will give results that are not optimal when hitting the ball. By swinging the racket at the other shoulder and shoulder following the movement will make the transfer of energy more leverage and the punch can be done more efficiently. (17) the other hand moves dynamically following the racket's movements is 48.7%. This needs to be understood by beginner tennis players where the hand that does not hold the racket can be a barrier to movement because it is stuck or does not move dynamically to follow the movement of the racket. This movement is usually done where the racket is on the other side of the shoulder while the hand that does not hold the racket is crossed on the other side. Need to understand from the coach and also the player itself because this movement fails also makes it unsightly.

Table 3: Movement analysis on follow through

No	Sub Indicators	%
15	The racket is swung fully to the other side of the shoulder	69.2
16	The shoulders are rotated following the racket swing until straight facing the net	28.2
17	The other hand moves dynamically following the racket's movements	48.7
Follow Through		48,7
The ability of Forehand Groundstroke Beginner Tennis Player		65.9

To measure the accuracy of the beginner tennis player's punch the field is divided into 4 zones point. In zone point 1, novice tennis players hit the ball falling in this area as much as 23.8%, in zone point 2 that was 18.2%, in zone point 3 it was 14.1% and in zone point 4 it was 12.6 % while the ball that was hit did not enter the playing field at 31.3%. The percentage of the ball coming out at the accuracy of the stroke by novice players is greater than the ball entering at zone points 1,2,3 and 4. It is important to note that the ball that is hit must be confirmed to enter the opponent's playing field. The ball falling in zone 3 and 4 is the best punching accuracy because in a tennis match the ball falling in this area keeps the opponent standing.

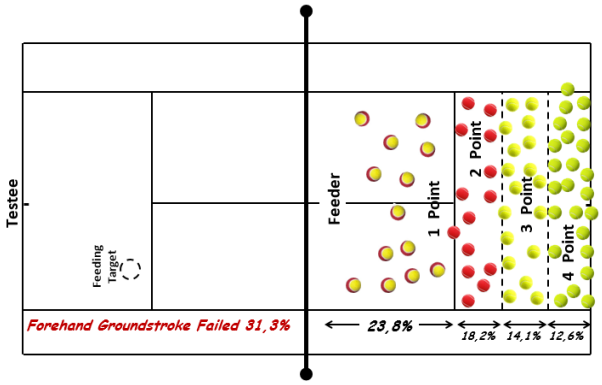

Figure 2: Results of placement groundstroke forehand analysis

In terms of the power zone punch power is divided into 3 zones. In the power zone 1 only 9.2% beginner tennis players hit the ball in this area, while in the power zone 2 was 18.7% and in the power zone 3 was 40.8% while the ball that was hit did not enter or exit the playing field by 31.3%. The bounce of the ball hit should be in zone 3 which shows that the ball that was hit fast also horizontally parallel to the net. The ball that bounces up to the power zone 3 makes the opponent will stay afloat because even if the ball is hit harder when the ball reaches the opponent's field it still requires a longer time whereas if the ball is in the power zone 1 and 2 when the ball reaches the playing field will be shorter so it requires more speed and readiness to restore it.

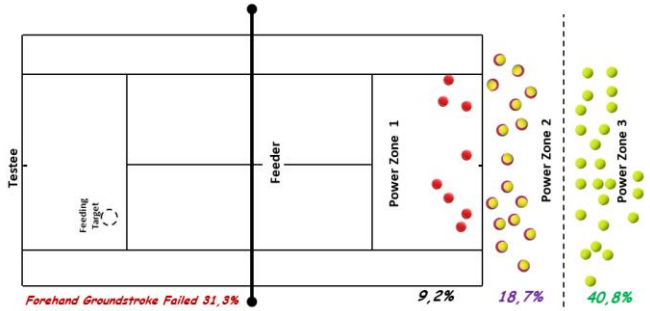

Figure 3: Results of power groundstroke forehand analysis

5. Conclusion and Suggestions

The truth of the movements of beginner tennis players in conducting forehand groundstrokes is 65.9%. This is composed of the correctness of movement in pulling the racket back at 67.7%, the truth of the movement of hitting the ball is 70.7% and the truth of making further movements is 65.9%. From the measurement of the accuracy of the novice tennis player's punch consisting of 4 zones, namely in zone 1, novice tennis players hit the ball falling in this area as much as 23.8%, in zone 2 which was 18.2%, in zone 3 it was 14, 1% and in zone 4 which is 12.6% while the ball that is hit does not enter the playing field is 31.3%. In the case of a power zone the power blow is divided into 3 zones. In the power zone 1 only 9.2% beginner tennis players hit the ball in this area, while in the power zone 2 it was 18.7% and in the power zone 3 it was 40.8% while the ball that was hit did not enter or exit the playing field by 31.3%.

Be a concern for coaches as well as beginner tennis players to pay attention to the correctness of the movement in conducting a forehand groundstroke where the movement to back swing needs to be done to prepare yourself to be able to hit the ball harder and also most importantly be able to control the ball. Forward swing and contact the ball becomes the core of the forehand groundstroke because the success of this stroke is determined by this movement. Proper recognition with the right angle will result in the ball entering, leaving the field or even involving on the net. While the follow through function to maximize the transfer of power and also to direct the ball in accordance with the wishes of the player. The placement and power of the ball being hit need to be considered because at the core of the game of tennis is to put the ball into the opponent's playing field and make sure the ball can be controlled by reducing the pressures of the opponent due to slow strokes and short falls near the net.

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