

An analysis of characteristics of the main skills performed by top-ranting chop-and-attack players and their uses of these skills

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1. Introduction

Audio-visual education programmes in physical education and the use of the TV image-creation systems and computers have changed the analysis of the teaching and training of table tennis from qualitative to quantitative. We used an advanced microcomputer (SMC-70 GP) to analyze the main skills of three world-class chop-and-attack players, Liang Geliang, Chen Xinhua and Tong Ling. The aim was to provide research a reference for table tennis professionals.

2. Forehand Chop

2.1 Analysis of the forehand chop against the high loop.

Liang Geliang, Chen Xinhua and Tong Ling are excellent chop-and-attack players. When they judge that a ball is a high loop, they shift the centre of the body to the right leg (they are all right-handed), keep their eyes on the ball, and swing the racket arm backwards and up. The tip of the racket is slightly higher than the shoulders, with the angle of the elbow about 60 degrees. At the same time the body turns right. They chop the ball downward forcefully with the back and knees bending so as to help control the ball. The racket face is slightly upward at the point of contact, and the contact is below the middle of the ball. The angle of the upper arm and the elbow is about 105 degrees after contact, about 45 degrees more than before, showing that they put forth their effort chopping downward. After finishing the stroke they adjust their position, the centre of the body being between the two feet, and prepare to organize the next stroke.

2.2 Analysis of the forehand chop against the fast loop.

Before chopping a very fast loop, the racket is taken back and up. The tip of the racket is nearly as high as the head. The upper part of the body is shifted to the right. The angle of the elbow is about 70 degrees. The racket moves forward and downward, and touches the lower-middle part of the ball as it is descending. At this time, the speed of the downward chop is very high. This not only helps overcome the strength and forward force of the top spin, but also increases the strength of the back spin. The angle of the elbow is about 115 degrees after chop. They retrieve basic posture with small jumping footwork after the chop movement.

2.3 Analysis of the forehand chop against a fast drive.

Before chopping against a fast drive, the body is shifted to the right. The racket is swung upwards, with its face nearly upright. By turning the waist, the arm is given power to contact the ball more forcefully. The wrist is locked as soon as the racket

touches the ball so as to offset the upward rebound force of the ball and to control the height of the arc of the returned ball. When the ball leaves the racket, the racket is swung downward, almost reaching the floor. The player returns to the basic position by jumping slightly.

2.4 Analysis of the forehand chop against a backspin or nonspin ball.

Against heavy backspin, the racket face is open slightly. The racket is brought a little higher than during general chopping, with an elbow angle of about 80 degrees. At contact this angle is about 125 degrees. As soon as the racket touches the ball, the player makes use of the turning of the waist and coordinates the upper arm and the wrist, to increase the backspin force. Computer analysis shows that when they chop heavy backspin, they spend only 0.08 second from the top of the backswing to contact with the ball; they swing the arm at a very high speed.

When the three players chop a nonspin ball, the backswing is lower than against heavy backspin. The elbow angle starts at about 85 degrees, the racket is swung forward and downward, and at contact the elbow angle is about 115 degrees. The face of the racket is slightly open, touching the lower-middle part of the ball. It takes only 0.1 second from the top of the backswing to the time when the racket touches the ball.

2.5 Analysis of the forehand chop against the middle ball hit-body ball.

The right leg moves backward as the ball approaches the middle-right part of their body, preparing for a forehand chop. The hip then turns quickly to the right, and the arm and wrist put forth strength forward and downward; the racket face is slightly open, the follow-through is downward after stroke. They quickly retrieve their ready position.

3. Backhand chop

Liang Geliang, Tong Ling and Chen Xinhua all play with different kinds of rubber on the two sides of the racket. To chop the loop on the backhanded they use long pimples.

3.1 Analysis of the backhand chop against heavy topspin.

Before these top players chop a high-spin loop, the racket is swung higher than the left shoulder. When they strike, the movement downward to the right with the help of the body is obvious. The knees are flexed to a comparatively high degree, and the feet are firmly set. This provides good conditions for balancing the body, putting force into the chop and moving quickly. The forearm chops powerfully to the right forward and downward as the racket is about to touch the ball. The point of contact is low: The racket touches the lower-middle part of the ball. After the ball leaves the racket, the feet quickly press down and the body returns to the ready position. From the computer description we can see that at the top of the upswing of the racket the angle of the elbow is about 70 degrees. At the point of contact it is about 110 degrees, and when the chop finishes, it is about 150 degrees.

3.2 Analysis of the backhand chop against the loop.

All three players' backhand chops are different against the loop. When the looped ball approaches the body, the knees are flexed so as to keep the center of the body stable. The forearm quickly swings upward, as high as the shoulder. At the same time, the body turns to the left, and the center of the body is over the left foot. At the top the backswing the angle of the elbow is about 65 degrees. It is about 115 degrees at contact and about 145 degrees at the end of the stroke.

3.3 Analysis of the backhand chop against the fast drive.

When they chop the fast drive, the upper part of the body is turned to the left. The racket is swung up towards the left shoulder, its face nearly vertical. At contact the face of the racket is almost at a right angle to the floor, and as it falls it strokes the lower middle part of the ball. The force on the ball is more to the right and downward, rather than forward.

3.4 Analysis of the backhand chop against the middle ball.

When these players judge that the opponent's ball is coming near the left-middle part of their body, they move one foot backward so as to make room for the swing. The forearm then chops forward and downward quickly and powerfully. Meanwhile the wrist is cocked slightly upwards but is not turned so as to lower the arc of the returned ball. At contact, the racket rubs against the bottom of the ball or the lower-middle part so as to increase the heavy backspin.

4. Return of the short-ball.

4.1 Analysis of Liang Geliang's returning of the short-ball.

Generally, Liang returns the ball by moving the right foot forward or by crossing it over the left foot. When the body is close to the table, he supports himself with the front foot and flexes the knees to keep his balance. The arc of the ball is controlled by the wrist at the point of contact. After contact the front foot quickly returns as he prepares for the next stroke.

5. Application of the skills.

Chop is a basic defensive skill. It has two main characteristics: steadiness and changeability. Its steadiness is shown by the player's standing far from the table and striking when the ball is falling so that he has enough time to prepare to return the ball. The ball is easier to return when it is falling since its speed, and spin have decreased by them. The changeability of the chop is mainly shown in the change of the spin and placement. A chop that combines the change of spin with the change of the ball's trajectory and the side-to-side, short-to-long variation in placement makes it difficult for the opponent when he returns the ball or even makes him miss. Since the loop appeared, it has brought a lot of difficulty to the chop player. Simply to chop steadily seems to have become too passive. The chop player needs to strengthen the change of spin, stress the development of his skill with steady chop as the foundation and to further emphasize the disparity between and nonspin. He must combine the change of spin with the change of placement, and must turn passive chop into active chop. He needs to develop the sense of attack and should be able to attack whenever he has the chance. This is the direction in which chopping play is developing. As far as the application of skills is concerned, chop players can be divided into two types: chop-and-attack, and attack-and-chop.

5.1 Application of the chop-and-attack skill.

5.1.1 This is the main skill that Tong Ling, Liang Geliang, Chen Xinhua and other top "defensive" players use, combining spin and nonspin chops with attack. They often adopt such tactics: for instance, by sending heavy backspin to the opponent's left corner, and then sending a nonspin ball to the right corner they force the opponent to move from left to right and from right to left. They make it difficult for him to judge the spin, so that

he returns a low-quality ball or even misses completely. Sometimes they send nonspin to the opponent's left side and then heavy spin to his right. Sometimes they send nonspin long balls and suddenly a short one with heavy spin. They use these methods to force the opponent to return the ball while moving, sideways or backward and forward, confusing him with the the change of the spin and the contact point on the table. This increases the opponent's difficulty in looping and driving, thus creating the conditions and opportunity for these players to counterhit while chopping. The player should be able to chop balls with great change in spin and to change the contact point on the table so as to confuse and move the opponent, thereby creating chances to attack. He should be able to find chances to even counterhit when his opponent has noticed the change in spin and contact point and is playing steadily.

5.1.2 To combine short chops with counter-hits to the corner.

Chen Xinhua and Liang Geliang can chop the ball to the corner of the table with forehand and backhand from the middle of the table and from close to the net forcing their opponents to produce a low-quality loop. This provides the chance to counterhit.

5.1.3 To combine chop and block with attack.

Chen Xinhua, Liang Geliang and others are good at moving their feet forward suddenly to block the ball while otherwise chopping continuously again producing chances to counterhit.

5.2 Combining attack with chop.

By this we mean more attack than when combining chop with attack. It has a higher rate of winning points.

5.2.1 Chen Xinhua's combination of attack with chop.

Besides his outstanding chopping. Chen is a very good looper. His urge to counterhit is strong. He uses both forehand and backhand to attack when he plays against a loop player. As soon as the force and speed of his opponent's loop decrease, he immediately stops chopping and loops instead. He also has a strong sense of attack after service. He often serves a spin or nonspin ball from either side, with the intention of mounting an immediate attack.

5.2.2 Liang Geliang's combination of attack with chop.

Liang can adjust his stroke easily and skillfully shifts to forehand counter-hitting after continuous chops on the forehand continuously. He can also switch from chop to loop. If he has the chance, he can attack and score continuously. He has a strong sense of attack after service. At the critical moment in the game, he often scores by attacking after a crouching service. When he has difficulty in counter-hitting, he will switch from attack to chop, looking for the chance to counterhit again.

If the chop player tries to improve his ability to counterhit and return the the loop, and if he tries to develop new skills, he will certainly achieve better performance.