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Article

Hydrodynamics analysis of different rotation forms of basketball teaching to improve the shooting percentage

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Abstract: From the perspective of fluid mechanics, combined with the knowledge of fluid mechanics, this paper analyzes the laws of several different rotation forms of basketball, and on this basis, uses the mechanical method and the vector synthesis method of speed to explore the influence of forward spin ball, back spin ball, and side spin ball on the shooting percentage. This paper points out the importance of ball rotation in the process of shooting and provides theoretical guidance for basketball teaching and training.

Keywords: rotation form; basketball teaching; shoot; fluid mechanics

1. Introduction

In a basketball game, shooting is the only way to score, and it is also the key to deciding the outcome of the game. There are many factors that affect the shooting percentage, such as the physical quality, psychological state, shooting skills, grasp of shooting opportunity, angle of projection, and incidence, etc. [1]. In the teaching and training of shooting technique, shooting action, aiming method, arc track, and ball rotation are the important factors that affect the shooting percentage. From the point of view of fluid mechanics, this paper makes some theoretical analysis and discussion on the flying track of the rotating ball and the shooting percentage in order to provide meaningful guidance for basketball teaching and training [2].

2. The hydrodynamics of improving the shooting percentage in the teaching of rotating basketball

2.1. Hydrodynamics analysis of basketball shooting rotation form

With the continuous improvement of jump shot technology and the emergence of three-point ball, there is more and more research into the characteristics of jump shots under different constraints [3]. With the development of movement control theory and the progress of testing instruments and means, researchers pay more attention to the deeper mechanism of shooting movement, such as the coordination characteristics of each joint, each link, and movement variation, as shown in **Figure 1**.

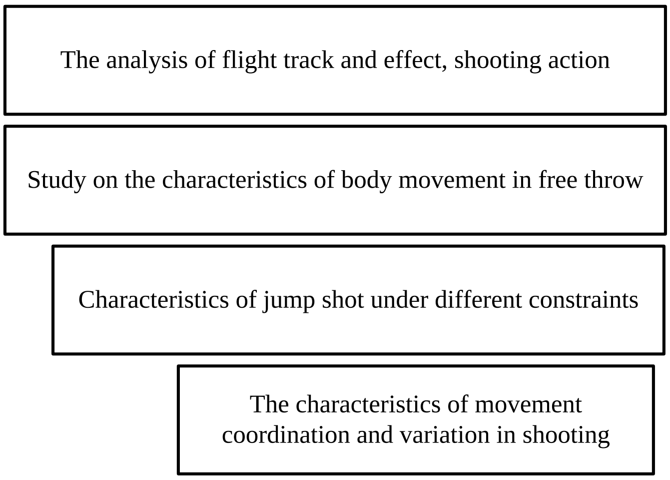

Figure 1. The action characteristics of basketball free throw and jump shot.

The factors that affect the result of shooting are the state of shooting, the characteristics of body movement and perception, and various constraints [4]. The organic structure of each analysis variable is shown in **Figure 2**.

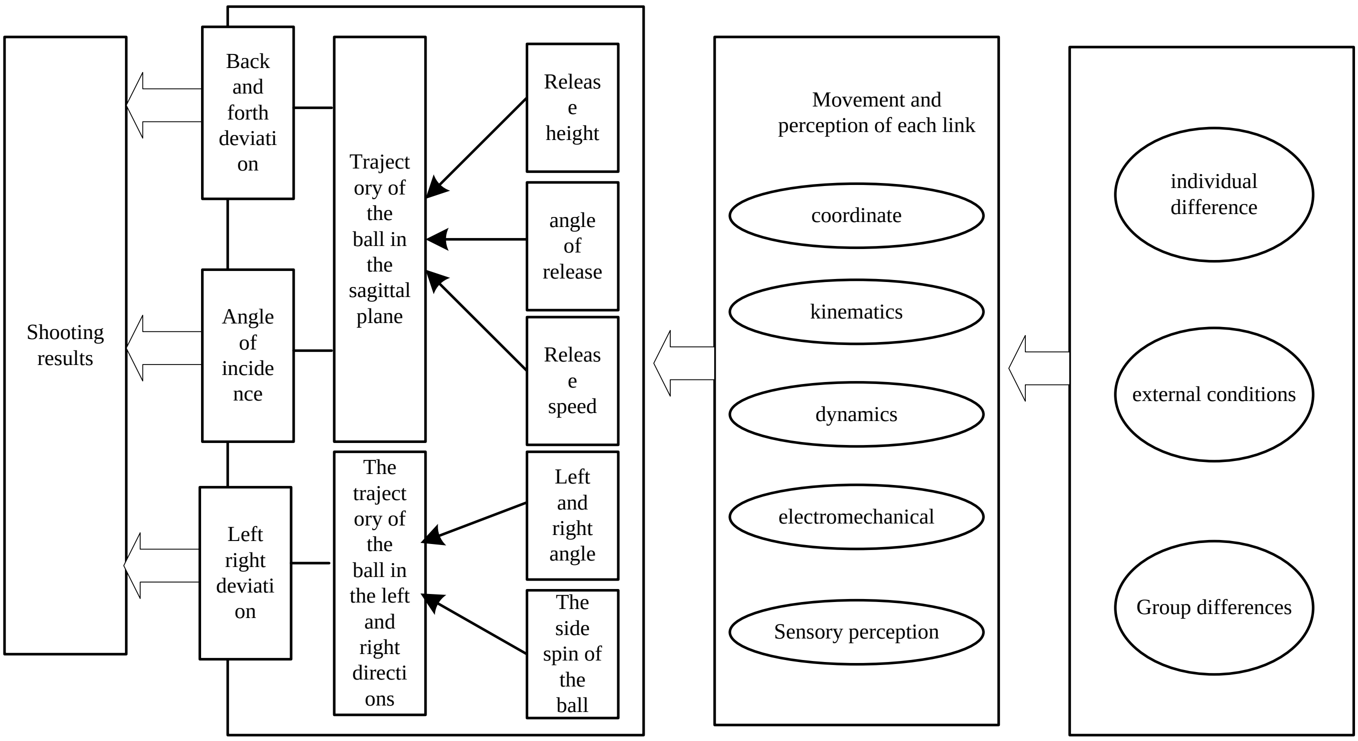

Figure 2. The variable structure that affects the result of shooting.

This paper summarizes the research on shot and penalty from five aspects: data collection method, shooting action stage division, shooting result shooting state, body link movement and perception characteristics, and the influence of various constraints. The variables that affect the incident angle are the displacement of the ball in the up and down directions, the front and rear directions, and the velocity of the ball [5]. The displacement of the ball in the up and down direction is inversely proportional to the height of the hand and proportional to the angle of the ball. The displacement of the ball in the front and back direction depends on the distance between the shooter and the hoop, and the shooting distance needs a higher horizontal speed [6]. Therefore, the displacement and velocity of the ball depend on the height of the ball, the speed of the ball, the angle of the ball, and the back rotation of the ball. The deviation of the ball in the front and back direction is determined by the displacement of the ball in the front and back direction and therefore depends on the speed of the ball. The radius of the standard hoop and basketball are 0.225 m and 0.123 m, respectively [7]. If the angle of the basket is 90°, the allowable front and back offset cannot exceed 0.102 m. The deviation of the ball in the left and right directions depends on the angle of the left and right directions of the hand and the side rotation of the ball. The allowable range is the same as the front and back offset and cannot exceed 0.102 m. The speed of the hand is the initial speed obtained by the ball in the moment of the ball. Lower shooting speed can lead to higher shooting hit rates, where permitted. High-level pitchers tend to shoot at the angle close to the minimum shooting speed, and lower shooting speed can reduce the movement variation of all parts of the body, thus increasing the stability of the movement [8]. Therefore, reducing the speed of the hand can make athletes have more time to adjust their movements through visual and body sensory feedback and reduce nerve noise. These studies show that athletes should shoot at the angle of the minimum shooting speed. But the athletes with poor strength often cannot produce enough strength, and short athletes are often at a disadvantage in the height of hand [9]. They must produce greater strength and speed through physical movement to make the ball hit.

2.2. Basketball shooting mechanics characteristic algorithm under different rotation situations

The shooting starts from the preparation position, and the basketball is thrown out by the lower limbs, stretching from the waist to the abdomen, raising the elbow, extending the arm forward and above, wrists forward, finger kicking, and using the strength of comprehensive coordination of the whole body. Among them, the strength of arm lifting, wrist forward bending, and finger-pulling basketball are the keys to controlling and adjusting the force of all parts of the body, determining the angle and speed of shooting, and the rotation of the basketball, thus affecting the shooting hit rate. In general, when shooting from middle and long-distance masters, basketball should be rotated backward along the horizontal axis. When shooting from the side of the basket, the basketball should rotate laterally [10]. When shooting with one hand and two hands in the middle and low hand, the ball should be rotated forward. The air resistance reduces the speed of the basketball, and its flight path is a plane curve, as shown in **Figure 3**. If the basketball is rotated and flying, the air layer on the surface of the ball rotates with the basketball due to the air viscosity, forming a circulation layer around the ball.

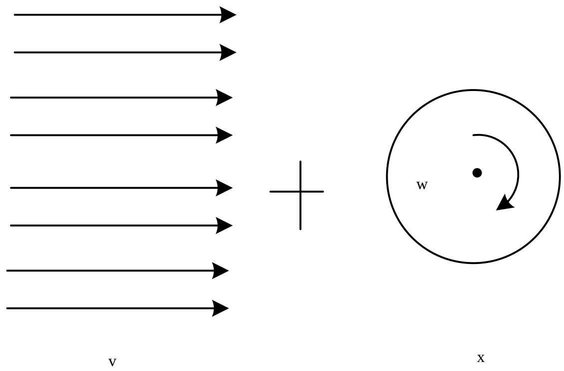

Figure 3. The force of the ball's rotation in the process of shooting.

The angular velocity of circulation *V* represents the speed of the air layer rotation around the rotating basketball. It is an important parameter in calculating the Magnus force. α is defined as the initial angular velocity of the basketball when it is released, which has a significant impact on the ball's flight trajectory. Let the angular velocity of the circulation be *V* and the forward translational velocity of the ball be *v*. With the ball as the reference frame, according to the principle of relative motion, it can be considered that the air flows from the forward direction of the ball at the velocity of V. As a result of the combination of the incoming flow and the circulation, the velocity difference is formed on both sides of the basketball [11]. According to Bernoulli's law, the pressure on the side with the increase in velocity will decrease, while the pressure on the side with the decrease in velocity will increase, thus causing a pressure difference force on both sides of the basketball, which is called Magnus force [12]. The Magnus force is a force acting on a rotating object in a fluid flow. It is caused by the pressure difference on both sides of the object due to the combination of the incoming flow and the circulation around the object, as described by Bernoulli's law. It is always perpendicular to the direction of movement, constantly changing the flight direction of the basketball. The Magnus force can be calculated using the principles of the Joukowski theory.

$$F_M = \frac{8}{3}\pi\rho w r^3 V = GwV \tag{1}$$

Among them:

$$G = \frac{8}{3F_M}\pi\rho r^3 \tag{2}$$

According to the Jukowski theory. Where r is the radius of the basketball, *p* is the air density, and *v* is the translational velocity of the basketball. Therefore, the rotating basketball will be subject to gravity and air resistance.

$$f = \frac{1}{2G}\cos v^2 = kv^2 \tag{3}$$

where *C* is the drag coefficient, s is the cross-sectional area of the basketball, and the influence of Magnus force *F*. Taking the shooting point of basketball as the coordinate origin, a rectangular coordinate system with the *oz* axis vertical upward is established. Suppose that the basketball rotates clockwise along the ox axis (facing the *X* axis) at the beginning, ignoring the air resistance torque and being conserved by angular momentum; the basketball always revolves around the ox axis [13]. Therefore, the magnetometer force always points to the normal direction of the vertical plane inside the track, and its magnitude is $f = Cu$. Considering that the gravity component is small in the tangent direction, ignoring it has little effect on the result.

$$fm\frac{dv}{dt} = -kv^2 \tag{4}$$

$$m\frac{v^2}{R} = Gwv + mg \tag{5}$$

By using the initial condition $t = 0$, $v = v_0$, available.

$$v = \frac{mv_0}{m + kv_0 t} - Gwv + mg \tag{6}$$

Substituting the initial conditions, the distance of basketball is as follows.

$$s = \frac{m}{k} ln \frac{m + kv_0 t}{vm} \tag{7}$$

The results show that:

$$\theta = \alpha - \frac{gt}{v_0} - \frac{G}{m} w_0 t - \frac{gkt^2}{2sm} \tag{8}$$

Among α is the initial angular velocity of the basketball. Suppose painting on a two-dimensional plane (desktop), the upper arm is only allowed to move in the horizontal plane, and the shoulder, elbow, and wrist joints are only allowed to move one degree of freedom (shoulder and elbow flexion and extension, wrist adduction and abduction), and only the final posture of the arm at the end of the painting task is considered. One of the possible variables is the Cartesian coordinate system position (x, y) of the hand (end effector) on the table, which is composed of a simple geometric model of the upper arm.

$$\begin{cases} x = l_1 \cos(\theta_1) + l_2 \cos(\theta_2) + l_3 \cos(\theta_3) \\ y = l_1 \sin(\theta_1) + l_2 \sin(\theta_2) + l_3 \sin(\theta_3) \end{cases} \tag{9}$$

The set of joint configurations that keep the position of the end effector unchanged is the set of solutions of the above equations [14]. In order to simplify the calculation, it often represents the angle formed by the link and the fixed line in the horizontal plane, and the linearization is based on the fact that the Jacobian matrix of the geometric model at the reference configuration is.

$$J(\Theta^\circ) = \begin{bmatrix} -l_1 \sin(\theta_1^0) & -l_1 \sin(\theta_2^0) & -l_1 \sin(\theta_3^0) \\ l_1 \cos(\theta_1^0) & l_1 \cos(\theta_2^0) & l_1 \cos(\theta_3^0) \end{bmatrix} \tag{10}$$

In order to compare different parameters and joints, the angular velocity of each joint is.

$$X_{ij} = \frac{P_{ij} - \bar{P}_i}{J(\Theta^\circ)\sigma_i} \tag{11}$$

where X_{ij} is the standardized parameter, P_{ij} is the original value of the i-th variable at the *j*-th time point, *P* is the average value of the *i*-th variable at all time points, and *P* is the standard deviation of the *i*-th variable at all time points [15]. In order to reduce the difference in the duration between different athletes, MATLAB software was used to program, and the spline interpolation method is used to interpolate the duration of each athlete's shooting action into 101 values so that it becomes 100% relative time, and the time interval is 10%. The flexion and extension values of each joint are shown in **Table 1**.

Table 1. Selection and definition of analysis variables.

	Variable	Definition
The ball	Release speed	The horizontal displacement of the ball leaving the hand, divided by the interval time
	Release height	The vertical distance from the center of the ball to the ground when the ball is released
	Angle of release	The square tangent value of the velocity in the vertical direction and the velocity in the horizontal direction when the ball is released
Upper limb	Flexion and extension angle of shoulder joint	The angle between the projection of the upper arm on the sagittal plane and the vertical axis of the human body
	Horizontal abduction angle of upper arm	The angle between the projection of the upper arm on the horizontal plane of the human body and the sagittal axis
	Elbow flexion extension angle	The angle between the plane of the shoulder axis connection and the elbow-wrist connection and the plane of the longitudinal axis
The legs	Angular velocity of shoulder flexion and extension	The difference between the last frame and the previous frame of shoulder angle divided by the interval time
	Angular velocity of wrist flexion and extension	The difference between the next and the previous frame of wrist angle divided by the interval time
	Angular velocity of elbow flexion and extension	The difference between the next frame and the previous frame of elbow angle divided by the interval time

2.3. The realization of the analysis of the hit rate of basketball rotation shooting under fluid mechanics

Shooting technique refers to the process of comprehensive coordination of all parts of the body when shooting. The aggregation of force starts from the preparation position of shooting, with the lower limbs pushing to the ground, and then stretching the body in the direction of shooting to the basket, especially with the help of the inertia of spinal extension, which promotes the coherence and coordination of the lower limbs, trunk, and upper limbs, and finally accumulates the muscle strength of various parts of the body in the arms, wrists, and fingers, so as to extend the arms [16]. The flipping and bending of the wrist and the flicking of the fingers throw the ball out. Because the shooting technical action is composed of multiple action links, in order to let the athletes master accurate shooting skills as soon as possible, this paper analyzes the shooting technical action link from the perspective of sports fluid mechanics. Appropriate holding technique is the premise to complete the shooting action correctly. For example, when shooting with one hand, five fingers should be naturally separated, the wrist should be tilted back, and the back and lower part of the ball should be supported by the part above the root of the finger. The palm of the hand should be empty, and the finger should be slightly bent. The bending degree is the same as the spherical radian [17]. The angle between the thumb and the little finger is about 800. The gravity line of the ball almost falls on the root of the finger between the index finger and the middle finger, and the elbow joint naturally droops; place the ball on the top of the same shoulder, hold the other hand on the lower part of the front side of the ball before shooting, and withdraw the ball when shooting. The so-called theorem of moment of momentum refers to the angular velocity of a rigid body, which is assumed to have a moment of inertia. The law of substitution is as follows:

$$M = I\beta = \frac{I(\omega_2 - \omega_1)}{t} \tag{12}$$

The results are as follows.

$$Mt = I(\omega_2 - \omega_1) \tag{13}$$

Using the theorem of rotation and the theorem of moment of momentum, we can make a simple analysis of the rotation of the human body's partial limbs and the whole body and apply it to the basketball shooting technique mainly from the following aspects [18]. If the ball collides with the backboard before entering the basket, its stress is shown in **Figure 4**.

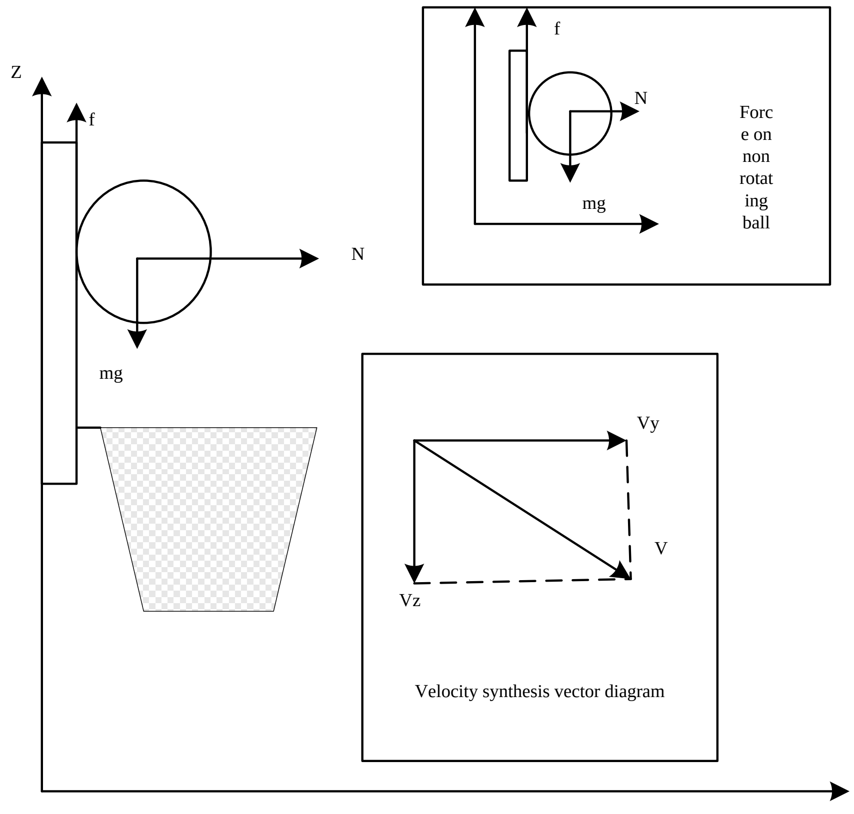

Figure 4. Force of forward spin ball hitting backboard.

where *N* is the positive pressure exerted on the basketball by the backboard (the back edge of the hoop) in the collision, the direction of which is perpendicular to the backboard, G is the gravity exerted on the basketball, and F is the rolling friction exerted on the basketball due to the rotation of the basketball [19]. The velocity direction of the center of mass of the basketball before collision is along the tangent direction of the trajectory, and the direction of the combined velocity V after rebound is shown in the illustration, θ represents the entry angle at this time. Compared with the non rotating ball, because the friction force between the non rotating ball and the backboard is sliding friction, and generally, the rolling friction force is far less than the sliding friction force, so the component of the velocity along the Z direction increases, and the incidence angle will be greater than that of the non rotating ball, which can increase the basketball hit probability [20]. For the convenience of analysis, the hoop on the far side of the basketball flight route is called the back edge of the hoop, and the hoop on the near side of the basketball flight route is called the front edge of the hoop. The force of the basketball when it collides with the back edge of the hoop is shown in the **Figure 5**.

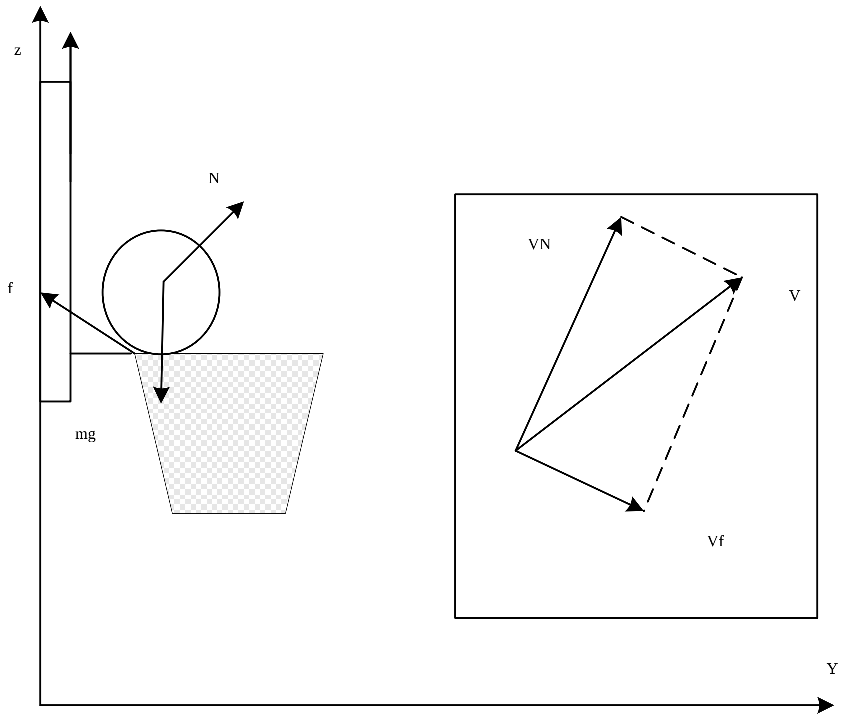

Figure 5. Force on the back edge of forward spinning ball basket collider.

Because of the collision, the positive pressure exerted on the basketball by the hoop is along the radius direction of the ball and points to the outside through the center of mass. The direction depends on the different contact points between the basketball and the hoop. The direction of the closing speed after the collision is much smaller than that of the hollow basket and the board basket; on the contrary, if the forward spin ball collides with the front edge of the hoop, the stress of the basketball is shown in the figure above. Because of the forward rotation of the basketball, the rolling friction acting on the basketball is along the tangent direction of the contact point. Its effect is to hinder the rolling of the basketball, and the direction is opposite to that of the sliding friction acting on the non-rotating ball. Therefore, the component of velocity along the direction of friction increases, which will increase the probability of the basketball rolling forward in the basket, and the direction of combined velocity is closer to the plane of the hoop. According to the law of forward rotation of basketball, the distance of basketball movement along the horizontal direction is shortened, and it falls rapidly after it is bounced up. Therefore, the collision between the forward rotation ball and the front edge of the hoop can also increase the shooting percentage, as shown in **Figure 6**.

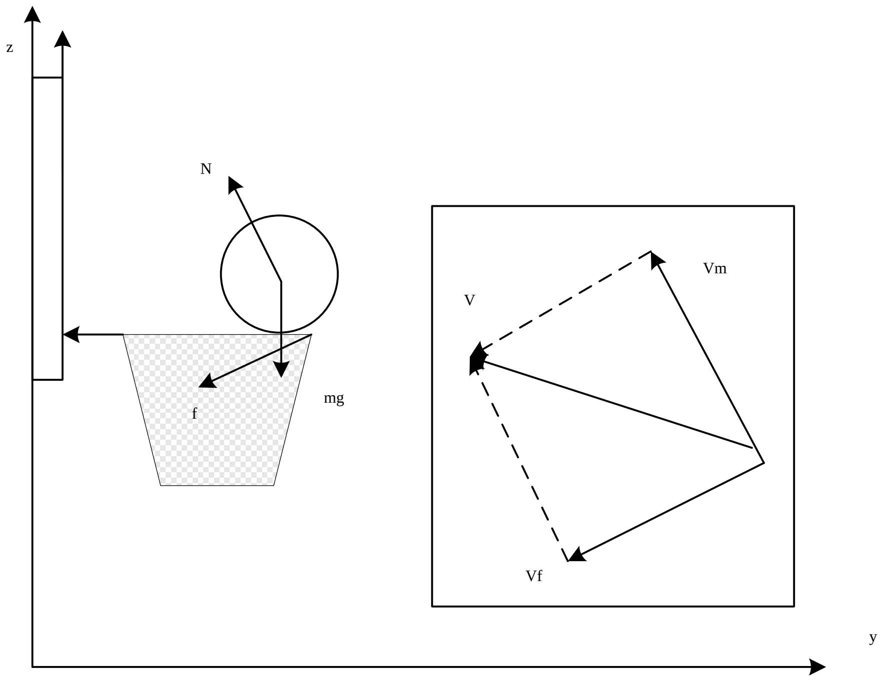

Figure 6. Front edge of forward spin.

The human body can produce a moment of momentum through active force. The moments of momentum can not only increase the rotation effect of the human body but also counteract the original moment of momentum and restrain the rotation of the human body. When shooting, there are two ways to deal with the left hand: One is to take the initiative to withdraw, and the other is to keep in the original position. For the first way, when shooting, the right shoulder has forward momentum along the longitudinal axis of the human body, and the left shoulder has backward momentum along the longitudinal axis of the human body due to the active retreat of the left arm. The momentum of the left and right shoulders is in the same direction, which increases the rotation effect of the shoulder axis and is not conducive to the stability of shooting. At the same time, because the rotation axis is the longitudinal axis of the human body, the rotation radius is small, so it is not conducive to the play of shooting power. For the second way, when shooting, the right shoulder has a moment of momentum along the longitudinal axis of the human body, but because the left arm remains in the original position, on the one hand, it increases the vertical distance from the center of gravity of the left arm to the axis of rotation. According to the formula of moment of inertia $I = MR^2$, it increases the moment of inertia; on the other hand, the left shoulder produces a moment of momentum along the longitudinal axis of the human body. In general, the momentum of the left shoulder is opposite to that of the right shoulder, which counteracts each other. There is no obvious rotation effect of the shoulder axis along the longitudinal axis of the human body. Because of the movement of other parts of the body, the shoulder axis has a forward translation, which makes the direction of the force and the shooting direction in the same plane. This can not only increase the stability of the shooting but also help the human body to play the force on the ball. The trajectory of the backspin ball is shown in the dotted line in **Figure 7**.

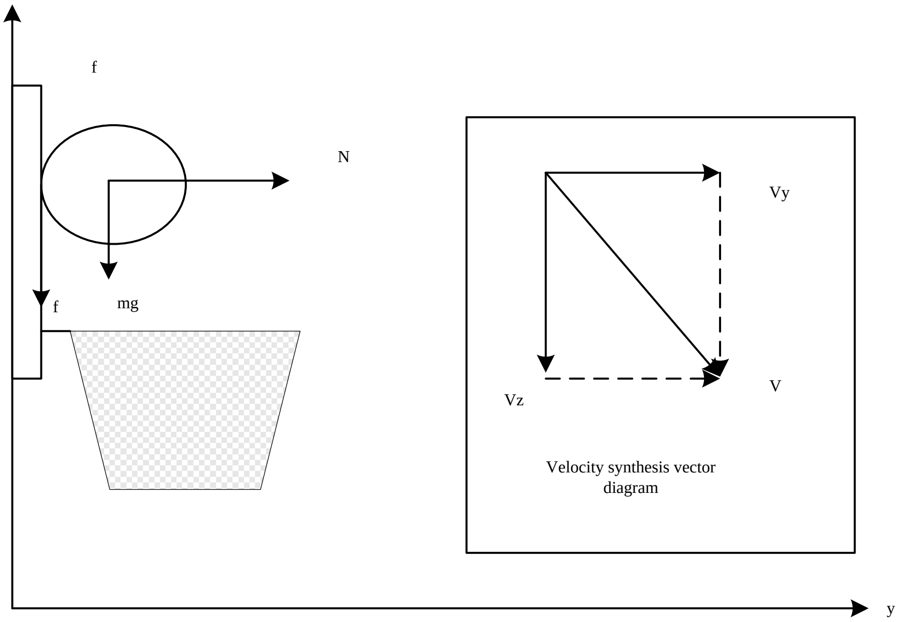

Figure 7. Backspin hitting backboard.

Compared with the forward spin ball, because Magnus force is outside the normal of the orbit, the acceleration of the basketball in the vertical direction decreases. Under the condition of shooting angle and shooting speed, the time of basketball flying in the air will be longer and the flight arc will be higher. This means a longer flight distance. Therefore, the backspin ball is more suitable for mid- and long-distance shooting, which helps the basketball to fly in the air and improves the hit rate. The bending degree of the track of the side rotation basketball is relatively large. According to the characteristics of the track, when the player is on the left side of the rebounds and the angle is very small, the basketball will be clockwise (from the top to the bottom). That is to say, rotating to the rim side can increase the hit rate of the hollow ball to a certain extent, and the right side is also true. Generally speaking, the side spin ball is often used for the basket under the plate shooting, which has lost the angle. The area under the basket is always the only place for attack and defense. Because of the tight defense of the other party, it is difficult for the attacking players to find the right aim point to complete the shooting directly under the basket, as shown in **Figure 8**. At this time, the side rotation ball's hitting plate shot shows the irreplaceable superiority.

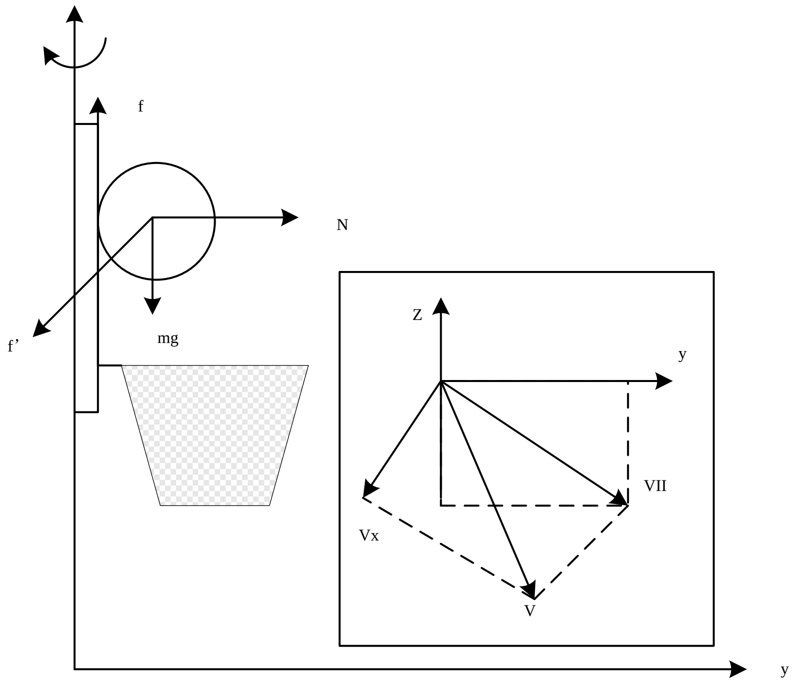

Figure 8. Side spin ball hitting backboard.

where *f* is the rolling friction force exerted on the basketball by the side-rotating rebound of the ball, and its direction is positive along the *X* axis. The direction of the rebound speed is along the lower left. Therefore, the basketball with clockwise rotation is more likely to enter the hoop if it is shot to the right. Moreover, the greater the angular velocity of the basketball side spin, the greater the lateral offset of the trajectory, and the more the right shot should be; in the same way, the counter-clockwise rotating basketball will move to the right and down after touching the backboard, so it should shoot to the left. After increasing the rotation angular velocity of the basketball, the touching point of the basketball should also move to the left. It can be seen that by changing the angular velocity of the basketball side spin, there is a larger choice range of the basketball touchdown point, so it can greatly improve the shooting percentage. If the ball doesn't spin laterally, the ball will hit the rebound point B, and it can't get the possibility of entering the basket after rebounding; however, if the ball spins laterally and rotates clockwise, the rebound force *F* and the reaction force *F* produced by the ball's lateral rotation act simultaneously after touching the rebound, and the resultant force direction of the two forces points to the hoop so that the ball can get the possibility of entering the basket. And the faster the ball spins, the greater the reaction force *F* of the backboard, the greater the reflection angle, and the direction of the resultant force of the ball will be more inclined to the hoop. For the side spin shot, which is far away from the rebound, the rotation speed of the ball is particularly important. When a cricket ball is played with side rotation, the rotation of the wrist and the twist of the fingers cause the ball to rotate around the sagittal axis. After hitting the board, the reflection angle of the ball will be obviously larger than the entry angle. Therefore, the playing point is farther from the center of the backboard than the ball that does not rotate, so it is not easy for the ball to fly out of the basket. We can use this rule to improve the shooting percentage. Through the above analysis, we can know that if the offensive players under the basket cannot find the right playing point and make rational use of the side spin of the ball, they can also get the chance to score. From the point of view of fluid mechanics, this paper discusses several basketball rules of different rotation forms involved in shooting technology. On this basis, through the force analysis of basketball, this paper analyzes its influence on the shooting percentage by using the vector composition law of speed and draws the following conclusion: The rotation of basketball is one of the important factors affecting the shooting percentage; enough attention should be paid in training and teaching. The forward spin ball is suitable for low hand shooting while walking and under the basket. The collision between the ball and the backboard or the front edge of the hoop can increase the shooting percentage. Backspin ball is suitable for medium and long-distance shooting. The collision between the basketball and the backboard or rim can improve the shooting percentage. Side spin ball can increase the power of attack under the basket, change the angular velocity of basketball side spin, increase the selection range of basketball touch board point, and improve the shooting percentage to a great extent.

3. Analysis of experimental results

The closing speed of the middle fingertip of the shooting arm was taken as the control variable because the middle finger and index finger belong to the end of the upper limb, which are the last contact parts with the ball when the ball is released, and play an important role in regulating and controlling the speed and direction of the ball. However, in the shoulder joint, maximum flexion speed ($E1$) (especially in the pitching stage, excluding other stages), the upper arm maximum internal rotation speed ($E2$), the elbow maximum extension speed ($E3$), the upper arm maximum abduction speed ($E4$), the wrist maximum flexion speed ($E5$), and the center of gravity maximum closing speed as the element variable ($E6$) are the important factors affecting the fingertip speed in the upper extremity. Therefore, these six variables are regarded as element variables. The speed of the middle fingertip is relatively stable in the stable stage of holding the ball, lifting the ball, and it increases sharply in the pitching stage until after the ball is released. The regression equation and evaluation parameters are shown in the table. The reliability test of the multiple regression equation in each shooting action was significant ($P < 0.01$), and the variance test of 93% regression coefficient reliability was significant ($P < 0.01$). In addition, the maximum and minimum determination coefficients of the regression equation in each shooting action of the outside pitcher group were 0.89 and 0.29, respectively; in the interior pitcher group, the maximum coefficient of determination is 0.81 and the minimum is 0.38. It shows that the multiple regression equation of the above element variables and the hand-closing speed of the middle fingertip has high reliability and validity, as shown in **Tables 2** and **3**. That is to say, the Jacobian matrix, which reflects the relationship between control variables and element variables, is reliable and effective.

Table 2. Parameter table of regression equation between fingertip closing velocity and six element variables.

	Variance test	R^2	Constant	K_1	K_2	K_3	K_4	K_5	K_6
Pitcher 1	$P < 0.001$	0.99	1.32	2.12	1.58	3.56	−0.93	2.11	0.98
Pitcher 2		0.68	1.52	1.89	−0.89	2.52	−1.23	2.36	1.22
Pitcher 3		0.28	0.99	2.12	−2.16	1.98	−0.87	2.45	1.99
Pitcher 4		0.88	2.13	2.21	1.80	4.32	−0.23	2.32	1.53
Pitcher 5		0.36	1.16	2.43	2.09	3.26	−0.48	1.13	0.88
Pitcher 6		0.60	0.65	1.11	1.55	5.25	−0.56	2.22	0.57

Table 3. Regression equation parameters of fingertip closing speed and six element variables of the inner line type throwing hands.

	Variance test	R^2	Constant	K_1	K_2	K_3	K_4	K_5	K_6
Pitcher 1	$P < 0.001$	0.56	2.16	1.28	2.00	2.90	−0.23	3.22	1.09
Pitcher 2		0.82	1.56	2.33	1.21	1.99	−1.56	2.15	0.89
Pitcher 3		0.47	0.88	2.14	−1.16	3.66	−0.78	1.52	2.22
Pitcher 4		0.76	2.46	2.11	1.89	3.88	−0.79	2.12	1.68
Pitcher 5		0.39	2.13	−1.55	2.45	3.15	−1.58	2.34	0.58
Pitcher 6		0.78	1.25	0.98	2.32	3.29	−0.77	3.17	1.55

After further optimization, the results shown in **Figure 9** are obtained.

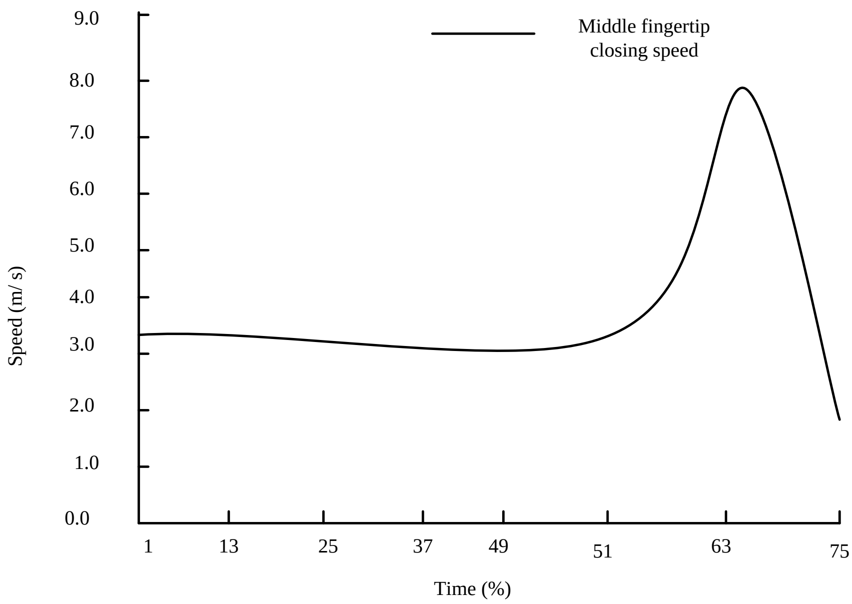

Figure 9. Change diagram of the middle fingertip closing speed during the jumper.

It is suggested that the teaching and training of basketball should focus on shooting skills, drive the all-round development of other skills, and other technical and tactical training should also aim at creating good shooting opportunities. Coaches should strictly require the athletes to train hard, start from the actual combat, and combine with passing, dribbling, breakthrough, and feint techniques for shooting training, which is conducive to the cultivation of athletes' sense of adaptability. In addition, strengthening the psychological and style training of players will also help to improve the accurate shooting ability of athletes in the game.

4. Conclusions

This paper analyzes the shooting technical movements and the mechanical characteristics of each link in the process of the ball from the release to the basket from various angles and discusses many factors that affect the shooting percentage, such as the different effects and possibilities caused by different release situations. The fierce confrontation of the modern basketball game requires players to master and use shooting skills skillfully in the complex and changeable technical and tactical contest. Shooting technique contains a variety of laws of human movement, among which fluid mechanics plays a decisive role. Coaches and players should attach great importance to this. In basketball teaching and training, we should make full use of the mechanical factors of shooting technology and work together to actively explore and use the scientific laws to improve the shooting percentage. The forward and backward rotation of the ball in shooting depends on the shooting action. The forward spin is mainly used for low-hand shooting, while the backward spin is mainly used for long-distance shooting; the faster the ball rotates, the better the stability of the ball. The backward spin increases the flight radius of the ball and improves the hit rate. The forward spin increases the ball speed and is mostly used for shooting in a fast break; it is more scientific to choose the back edge of the aiming point than other points. Shooting action is composed of multiple technical links, and each link is a complementary whole. Therefore, to master the shooting technique, we should pay attention to the function and coordination of each link and pay attention to the comprehensive effect of each link.

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