

The Measuring Ball Spin at the Service in Table Tennis by Junior player

Shinji Iizuka¹⁾, Yukihiro Ushiyama²⁾, Kazuto Yoshida³⁾, Yang Fei¹⁾, Zhang Huan yu¹⁾, kei kamijima¹⁾

1) Graduate School of Modern Society and Culture, Niigata University

(TEL: +81-90-3244-3748;E-mail: ketchi526_family@yahoo.co.jp)

2) Institute of Humanities Social Sciences and Education, Niigata University

3) Shizuoka University Faculty Education

Abstract: The purpose of this study was to clarify for the junior elite academy table tennis players to improve and strengthen by recognizing their own data. The serve ball rotation data was presented to the coaches and the players in September and December to examine the effects on the serve techniques and practice method. However, the players started to become more conscious of serve ball rotation, which can be considered effective for their future technical improvements.

Key word: table tennis ball spin high speed camera

1. INTRODUCTION

In any ball sports, the ball's rotation is a big factor in performance. For example, in baseball, a pitcher throws a variety of breaking balls according to the number of spins and pivot angles. Especially in table tennis, it is a very important factor. The serve ball rotation is considered the most important key which can be technically self-controlled by each player during the match. On the other hand, in general practice, the coach's personal sense is strongly affected, so in many cases the instructions may not be clear to everybody. Therefore, the serve ball rotation was measured, and the data was shown to the players and coaches as a visual objective to help them to recognize it. As a result it was considered helpful in producing effective practice for the future.

In this study NTC's (National Training Center) junior elite academy table tennis players' serve ball rotation was measured. The data was shown to the players and coaches in September and in December to compare the

changes in rotation and player awareness. Thus, this study was aimed to suggest and help improve practice methods.

This study was also carried out as part of the Sports Medical and Science study projects in 2008 at National Sports Science Center as project study B "Table tennis serve ball spin and motion." "Study method:

2. METHOD

2-1. Subjects

The subjects were six players of the elite academy. The second measurement in December had only four subjects since two of them were absent due to injury or matches played overseas. The characteristics are shown below in the table 1.

table 1 the players' characteristics

| subject | sex | grade | dominant hand | play type / grip |
|---------|--------|---------|---------------|-----------------------------|
| Sub.A | male | 1st JHS | right | Shakehand Attack type |
| Sub.B | male | 1st JHS | right | Shakehand Attack type |
| Sub.C | male | 1st JHS | right | Shakehand Attack type |
| Sub.D | female | 2nd JHS | right | Shakehand-cut Militant type |
| Sub.E | male | 1st JHS | left | Shakehand Attack type |
| Sub.F | female | 2nd JHS | right | Shakehand Attack type |

2-2. Measurement of serve ball rotation

(1) About the measurement of serve ball rotation:

Based on the preceding study by the group of Ushiyama¹⁾ each player's serve motion was photographed by a high speed camera which can produce 600 exposures per second. The players were instructed to serve a ball three times in three different serve conditions according to

table 2.

The number of spins were totaled by digitizing a marked point on the ball and calculated out from the direction and distance from the served point according to the video picture.

Table 2 Three test serve conditions

| test motion no. | conditions |
|-----------------|--|
| 1 | Similar serve motion with two different ball rotations |
| 2 | Similar serve motion with different course and speed |
| 3 | Subject's self-specified rotation serve |

(2) Study on the players' awareness of serve ball rotation:

This research was conducted on the four players whose data was available in December. For questions 1 and 2, they were required to answer with YES, Not clear or NO. To question 3 they were required to answer with YES, Not Clear, NO or No idea. Furthermore, to question 2 and 3, the players who answered YES were asked to explain in detail such as Q.2 = Did you try to change anything? , and Q.3 = How did it change?

The questionnaire is included below in table 3.

Table 3 questionnaire

| question no. | questions |
|--------------|---|
| 1 | Since the Sep.measurement, have you been more conscious to the serve ball's spinning amount? |
| 2 | Since the Sep.measurement, have you tried to invent your practice to change the rotations? |
| 3 | Compared to the Sep.measurement, have you realized any change on your serve ball rotation amount in December? (regarding your specified 3 type of serves on the test motion no.3) |

3. RESULTS AND STUDY

From the two aspects of the three serve motions ball rotation comparison in Sep. and Dec. (Figures 1, 2) and the players awareness research (Tables 4, 5, 6), the results were examined to see how it can affect practice improvement. However, as previously noted, the Dec.

measurement only included four subjects, and the Sub.C had done only two serve motion tests.

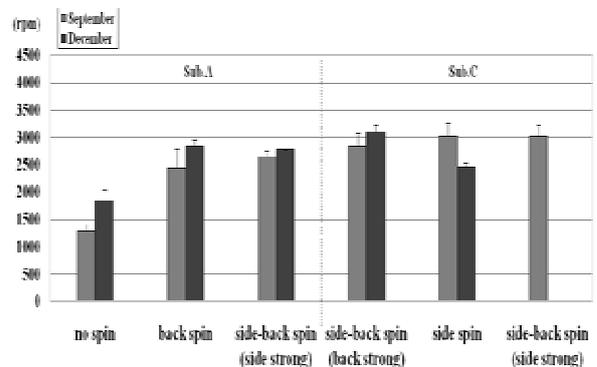


Fig.1 Sub.A • Sub.C serve ball spinning comparison

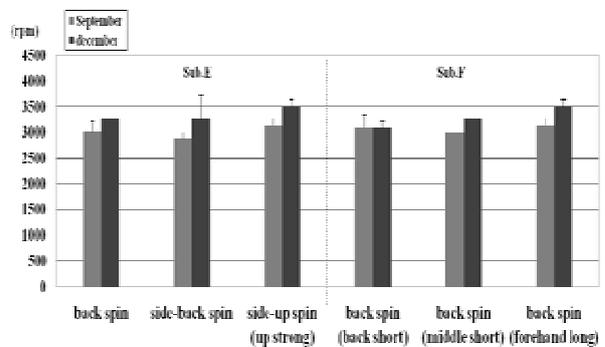


Fig. 2 Sub.E • Sub.F serve ball spinning comparison

Table 4 Awareness on serve ball spinning amount

| | | |
|--|---|----------------|
| Q1. Since the Sep.measurement, have you been more conscious to the serve ball rotation amount? | | |
| YES | 4 | Sub.A, C, E, F |
| Not clear. | 0 | |
| NO. | 0 | |

Table 5 Invention to make any change

| | | |
|---|---|-------------|
| Q2. Since the Sep. measurement, have you tried to invent your practice to change the rotation amount? | | |
| YES | 1 | Sub.C |
| Not clear. | 3 | Sub.A, E, F |
| NO. | 0 | |

Table 6 Change on the serve ball spinning amount

| Q3 Compared to the Sep.measurement, have you realized any change on your serve ball rotations in December? (regarding your specified 3 type of serves on the test motion no.3) | | | |
|--|----------------------------------|-----------|--|
| Sub.A | Knuckleball | NO | |
| | Down rotation | NO | |
| | Side-Down rotation(Side Strong) | YES | Rotations increased due to focusing swings. |
| Sub.C | Side-Down rotation(Down Strong) | Not clear | |
| | Side rotation | Not clear | |
| Sub.E | Down rotation | YES | More rotations were recognized. |
| | Side-Down rotation | YES | Ball position lowered by the net. |
| | Side-Up rotation (Up Strong) | YES | More balls were kept on the table. |
| Sub.F | Down rotation (Back Front) | NO | |
| | Down rotation (Middle Front) | YES | Rotations seemed to be decreased. |
| | Down rotation (Forward Deep) | YES | Side rotation seemed like increased and down rotation decreased. |

3-1. About Sub.A

In all three serve motions, the amount of rotation had a tendency to increase. However, regarding the knuckleball serve, it was determined to be more effective without intentional spins so are not necessary here. Regarding the player’s awareness, according to table 4, from Sep. measurement Sub.A paid more attention to the spins. Therefore as a result the amount of rotation seemed to increase. In addition, from the table 6, Sub.A expressed the reason for the increase which was due to the focusing swings. Among all, regarding the Side-Down rotation serve (Side Strong), since the Sep. measurement, Sub.A tried a more intensive serve practice which seemed to

result in the increased rotation.

3-2. About Sub.C

The amount of rotation increased and also decreased in different motions. From the awareness research in table 5, Sub.C expressed in detail that the serve practice was done focusing on making more impact at the moment when the racket contacts the ball, which showed the player paid more attention to produce effective practice by self invention.

However, according to table 6, Sub.C answered that the change in the serve ball rotation was not noticeable. Thus, it can be assumed that what had been focused on and what changes are recognized by the player are not always the same.

3-3. About Sub.E

Similarly to Sub.A, the amount of rotation tended to increase in all three motions. From the awareness research in table 4, Sub.E became more conscious of serve ball rotation from the Sep. measurement and seems to have resulted in the increase of the amount of spin in all serve motions. Furthermore, from table 6, Sub.E answered about the changes in detail on each serve as follows: for the Down rotation serve more spins were recognized and it matched to the reality. As for the Side-Down rotation serve, the ball position seemed to lower when passing the net compared to before. For the Side-Up rotation serve (Up Strong) more balls were kept on the table. In neither case, the spin change was not mentioned. However, assuming from all the results, Sub.E seemed to improve the serve technique and gained more spins.

3-4. About Sub.F

The spins increased in two serve motions and decreased in the other. From the awareness research in table 6, regarding the noticeable change on spins, Sub.F answered the spin seemed to be less than before on the Down rotation serve (Middle Front.) However, figure 2 shows rotation tends to increase; therefore, it can be said that the player’s recognition and reality do not always match. On the other hand, regarding the Down rotation serve (Forward Deep), the player realized that the side rotation increased but down rotation decreased. Figure 2 shows the tendency of increased spin is probably due

to the increased side rotations.

4.CONCLUSIONS

This study was intended to examine how recognition of objective data would affect to improve practice method to the junior elite academy table tennis players by measuring and comparing serve ball rotation in Sep. and Dec. and performing awareness research. The summary is as follows:

Since the Sep. measurement, making the players pay more attention to their serve ball spin, the rotation tended to increase in Dec. for most players. Among all, there was only one player who tried to invent intensive serve practice. Regarding the change in serve ball rotation, the results were varied. Some realized the same as reality and some did not notice any change. The others felt differently from the reality.

From this result and study, it cannot be concluded that this practice was effective for this purpose. However, it is a fact that this study could make the future promising for the elite table tennis players by them becoming more conscious of the serve ball rotation and obtaining a self-controlled useful technique in the match. Moreover, it made them realize the existence of other players who were more aggressive at improving their serve practice. This would surely motivate and lead them into the invention of better practice methods, strengthening themselves for the future.

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