

A Study of Rugby Punts in Japan's Top Level League: Qualitative Research Follow-up to Quantitative Result

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The purpose of this study was to obtain qualitative knowledge regarding the effective punts in rugby union by using an embedded model of mixed methods. In previous research, punts in the last 20 min; punts past own team's 22m area; punts in Turnover, Restart, and Quick tap; punts in 1 ruck/mauls; and punts in Scrum Half were significantly different between the Winning Team and Losing Team. For better interpretation of these results and further analysis for this qualitative research, a semi-structured interview was conducted with two elite Japanese players. The systematic cause analysis technique was used to analyze the data.

Our findings were as follows:

- Winning Team could use Area kick, Grubber kick, and Kick pass past their own 22m area.
- High accuracy of the Long kick is one of characteristics of players in the Winning Team.
- Punts by team tactics would be effective in the Restart situation.
- A dominance at an attacking gain line in the opponent's area provides players an opportunity to use punts in Scrum Half.

These findings contribute to the practical knowledge regarding punts and could be useful for players and coaches.

Keywords: rugby, punts, mixed methods, qualitative research, SCAT

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1. Introduction

Games in the Rugby football union (hereinafter abbreviated as "rugby") are played with a variety of rules, for example players can run with, pass and kick the ball (Yamamoto and Fujimori, 2017). Kicks can be classified into punt kicks, place kicks, and drop kicks, and furthermore, punt kicks can then be classified into long punts, high punts, short punts, and grab punts (Tsujino, 1990). One of the purposes of punting is to gain an advantage in territory in exchange for giving the other team possession of the ball (Vaz et al., 2010).

According to Nakagawa (2011), a descriptive game performance analysis that quantitatively processes game results from a specific point of view in rugby is a useful tool for understanding the performance evaluation and game structure of individual teams and players, as well as for doing tactical research. From this point of view, a quantitative analysis on the use of punt kick tactics was made. One of the trends of the analysis of the winning teams in the

six European leagues from 2003 to 2006 was "kick ratios" and "the number of kicks which went outside the touch line". In some cases, these were reported as "foot games" (Ortega et al., 2009). There are many strong rugby teams among the southern hemisphere countries, such as New Zealand, Australia, and South Africa. Compared to the leagues in the northern hemisphere, the leagues in the southern hemisphere often develop their teams around performing speedy rucks (Shimasaki et al., 2013), and due to their favorable climatic conditions and ground conditions, "open games" in which the ball is actively moved with continual advancement are thought to be a characteristic they prefer in games (Kraak et al., 2016). Even in such leagues in the southern hemisphere, it was clarified that the characteristic indicators of winning teams were "meters gained (the distance the ball is advanced beyond the gain line)", "line breaks (the number of times the defense's line was broken through)", and "tackle success rates", as well as "the number of kicks which went outside the touch line" (Van den berg and Malan, 2010).

Traditionally, in northern hemisphere games there are many kick-attempts, and in the southern hemisphere games, speedy and open games are preferred. In both hemispheres, it can be said that the use of punt kicks is one of the important aspects of play in top-level rugby games (Vaz et al., 2010).

However, in the research that has been conducted so far, the "number of times" that punt kicks were used in the game has been reported as one of the aspects of the winning team, but a detailed aspect of their utilization has not been sufficiently examined. Although Kraak et al. (2017), in fact, pointed out that "when to use these kicks and how to use them effectively are important aspects", it was unclear what kind of punt kicks were frequently used tactically by the winning team, what kind of utilization they had, and what kind of punt kicks could be evaluated as effective. Regarding this situation, as an indicator for future study, Nakagawa (2019) claimed that in order to comprehensively discuss the scientific knowledge of rugby games and conduct effective research on tactics and tactical skills, it is necessary to empirically verify the "effectiveness of existing tactics". From this viewpoint, it could be meaningful to explore the aspect of the specific utilization of punt kicks in the top leagues.

Therefore, Koyanagi (2019) analyzed the aspect of utilizing punt kicks among teams in the top leagues in Japan. The results reported 5 types of punt kicks, which were "Punt kicks during the 60-80 minute mark", "Punt kicks made past their own 22", "Punt kicks in the turnover, restart and quick tap phases", "punt kicks in the 1 R/Ms" and "punt kicks made by the scrum-half".

From this research, the specific aspects of utilizing punt kicks were clarified, and new findings regarding the effective utilization of punt kicks were obtained. However, this was reported as an aspect of the natural sciences, and they focused on the quantitative and external aspects; so to speak, it was about results and outcomes, and thus there are still uncertainties for its use as concrete knowledge at the coaching level. Asaoka (2019) mentioned that this quantitative analysis should aim to pursue "objective truths" that are always true regardless of whenever and wherever they are attempted, or whoever did it (including whoever looks at it)." There are also humanistic and sociological qualitative studies that can interpret and give meaning to what is inherent and what cannot be measured only by such quantitative aspects. These

studies aim "to share specific facts as a mutually and subjectively understandable facts through the ideazation (conceptualization) of the content of the phenomenon. In other words, they aim to clarify what kind of event is happening in a place, and what kind of meaning it has (Asaoka, 2019). It has been pointed out that the knowledge that is sought is "an explanation of the situations and processes leading up to them during a game", "clarification of the psychological states of players", and the "realization of latent problems" (Otani, 2019). By doing so, it will be possible to clarify values that cannot be considered only by quantifying the number of times or distances.

Using such qualitative studies and from the aspect of utilizing the punt kicks which were in the quantitative study made by Koyanagi (2019), if we can obtain practical knowledge about the ability to tactically think (perceptual and cognitive elements), including the player's knowledge and thoughts when using punt kicks, it would be considered useful for improving the ability to form individual tactics during coaching situations (Aida, 2008), as well as for linguistic instruction there. In addition, this subjective information, i.e. practical knowledge also functions as a "know-how" during exercising, and is extremely important for athletes and instructors (Ae, 1999). It will be extremely useful for first-class players whose skills are outstanding on the field, and it will also meaningful knowledge for junior-tier players during training situations (Funaki and Aida, 2016).

Based on the above, using the quantitative research results that summarize the aspects of punt kicks, along with interview surveys with top-level athletes in Japan, we qualitatively interpreted the results to obtain qualitative knowledge about effective punt kicks.

2. Research method

This study used an embedded mixed research method model. The mixed research method is a combination of quantitative and qualitative approaches; one of the embedded models has a dataset which provides a supportive and secondary role for the research based on the other dataset (Creswell, 2010). In addition, mixed research methods have been used more and more widely in rugby competition (Kraak et al., 2016; Kraak et al., 2017).

First, in this study, we conducted an interview

survey as a qualitative analysis. It was based on the results obtained by Koyanagi (2019), who studied and reported on the aspects of the utilization of punt kicks quantitatively. Next, in order to further deepen the interpretation, we conducted a quantitative analysis on the issues which were clarified in the interview survey as well as on other matters to be verified, and thus, we supported an interpretation of the qualitative analysis, which allowed us to systematize mixed methods (Figure 1).

Qualitative approach

2.1. How we collected the qualitative data

We conducted semi-structured interviews to collect the qualitative data. In the semi-structured interviews, the content and flow of the questions were set in advance, but some other questions were also set in accordance with the responses of the research participants (Otani, 2019). It is also considered to be useful to draw out the background and potential ideas from the participants, understand them inter-subjectively, and construct them (Kujiraoka, 2005). There were quantitative differences between winning

teams and losing teams in the following answers: "Punt kicks during the 60-80 minute mark", "Punt kicks made past their own 22", "Punt kicks in the turnover, restart and quick tap phases", "punt kicks in the 1 R/Ms" and "punt kicks made by the scrum-half". We asked preset questions to find out the reasons for the differences. I (a researcher) served as the interviewer, and the interviews were recorded using a voice recorder after obtaining prior permission.

2.2. Study participant sample size

As study participants, we selected two appropriate interviewees in order to collect data suitable for the purpose of this study (purposive sampling). According to Sandelowski (2013), the appropriate sample size for qualitative research depends on the "quality of the information collected", "the research methods and sampling strategies used", "the intended research results," and the experience and judgment of the researchers. As long as the validity of the researcher and the purpose of this study are satisfied, even if the sample size is small, it can be considered to be valid.

As a researcher, I have seven years experience

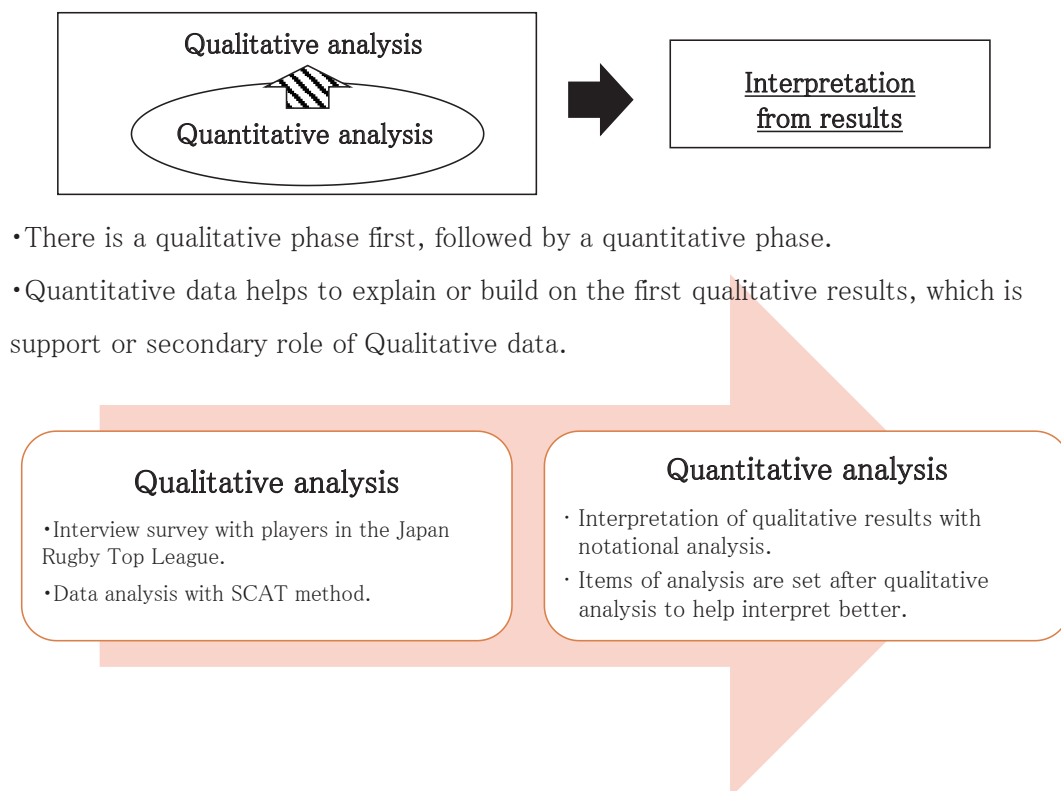


Figure 1 Embedded model (Creswell, 2010)

coaching rugby games, and also have experience working as a national representative as an analyst in charge of analytical work.

It can be considered that I have sufficient knowledge and understanding to proceed with conducting interviews on the effectiveness of punt kicks. In addition, the purpose of this research was a qualitative survey to deepen the interpretation of quantitative research results that have already been reported. It does not aim to construct a novel theory. From the above, it can be considered that a sample size of two research participants sufficiently satisfies the validity of the analyst and the purpose of the research.

2.3. Study participants

The study participants were Mr. K of team H, who played as a stand-off, and Mr. N from team T, who played as a scrum-half. They participated in the Japan Rugby Top League 2016-2017. Their highest rankings in the Japan Rugby Top League were 11th place for Team H and 3rd place for Team T.

Both are highly competitive players with more than 50 top league caps (number of appearances). Mr. K was chosen as a player for a team representing Kansai area, and Mr. N was famous after he was chosen as a player for all Japan high school team and the U20. Both of them are considered to have a wealth of experience and knowledge. In addition, since they are currently 36 and 30 years old, they have plenty of experience verbalizing their skills, knowledge, and experience (Sanderowski, 2013).

2.4. Ethical considerations

This research was carried out with the approval of the Faculty of Liberal Arts at University A (approval number: 2019-4). Prior to conducting the research, we explained its outline and that there would not be any harm caused by participating in it, and we then obtained consent from the participants (Flick, 2011). Furthermore, before proceeding with the interviews, we agreed that the consent could be withdrawn at any time.

2.5. How we analyzed the qualitative data

First, based on the interview data, we paid attention to the "necessity of creating a record of itself word

for word", the "selection of words to be described", and the "entirety of the description method" to create a verbatim record that faithfully transcribes their remarks (Sanderowski, 2013). For these interviews, I served as the interviewer, and I converted the interviews with the players into text while mutually confirming.

After that, we used SCAT to analyze the collected data. SCAT was developed by Otani (2019) as a method of analyzing qualitative data. By "formulating and clarifying" the process of a qualitative analysis, it improves the validity of the analysis when generating a concept, and it is believed to be useful for small-scale data or beginner analysts. For the analysis procedure, we described the segmented data in a matrix and performed "de-contextualization" in the following order to generate a concept in it:

- <1> Words and phrases from the data that are of interest
- <2> Words that were not in the data but are used for paraphrasing <1>
- <3> Words needed to explain the words in <2>
- <4> Themes and constructs that have emerged from these words

Then, in order to describe the theory, we depicted the storyline by reviewing the concept generated in <4>, and performed "recontextualization". The use of SCAT is not limited to research in pedagogy, nursing, and medical science, but also in the field of sports science. It is used for categorizing background factors of thinking that might lead to feelings of overwhelming and nervousness (Tsutsui, 2015), and for conceptualizing the formation process of a group language in the field of linguistic instruction.

2.6. Results of the qualitative approach

Based on the theory description, it became clear that the following six factors are related to the utilization of punt kicks: "Factors involving individual decision-making (factors that depend on an individual's judgment for a situation)", "Factors involving game structure (factors, other than punt kicks, that depend on the game's aspects)", "Factors involving team tactics (factors that depend on pre-set team tactics)", "Factors involving subjective game situations (factors that depend on mental and psychological causes)", "Factors involving objective game situations (factors that depend on the generation of physical space)", "Factors involving position

Table 1 Theory description of SCAT

	Mr. K	Mr. N
Time	<ul style="list-style-type: none"> • There is a significant difference due to mental pressure with respect to "Factors of subjective game situation." • The "Factors of team tactics" include Possession rugby that intends to hold a long ball, and Territory rugby that intends to have a superior position. • Winning team most likely have a lead even in the last 20 minutes; hence, they often choose Possession rugby. • In contrast, the losing teams are less likely to have a lead even in the last 20 minutes; hence, they often choose Possession rugby. 	<ul style="list-style-type: none"> • The difference in kick utilization has a large effect on decision-making with respect to "Factors of subjective game situation." • The winning team does not have to possess the ball far from the opponent's goal line. • The losing team is less likely to use the kick and keep the ball to score in order to make up the point gap.
Area	<ul style="list-style-type: none"> • The winning team could use an appropriate punt in each zone with respect to "Factors of team tactics." The factors required are "A number of kickers' technical elements," "tactical decision-making," and "high DF ability to win a ball." • The purpose of punts in each zone is 'Area recovery' when in one's own zone or 'Creation of Contest' in order to regain a ball. • In addition to the punt tactics in each zone, the winning team often uses punts based on individual decision-making, and there are many players involved. Therefore, it is possible to set a strategy that depends on individual skill, which encourages the winning team to use punts. 	<ul style="list-style-type: none"> • In the own 22 m zone, "Factors of game structure" affected the winning team spending less time in that position. • Regarding own 22 m to Halfway, the winning team spent a shorter time in the own 22 m zone and had a relatively longer time from own 22 m to Halfway. • On the opponent side, the "Factors of game structure" and "Factors of subjective game situation" affected the difference in punts. • "Factors of game structure" indicated that the winning team spent a longer time on the opposite side. • "Factors of subjective game situation" indicated that the winning team had a higher attack strength than the losing team. With high attack strength, the opponent often concedes penalty in defense and secures an advantage of penalty, and it makes it possible to select 'one or eight' play, such as a kicking pass. In addition, even if you do not get an advantage of penalty, the winning team can select a "one or eight" play as "Factor of subjective game situation."
Start of Possession	<ul style="list-style-type: none"> • Turnover is influenced by "Factors of game structure," "Factors of individual decision-making," and "Factors of objective game situation." • The winning team has a high defensive ability. Therefore, they could get more number of turnovers, which is part of "Factors of game structure." In addition, turnover is a situation where the opponent's formation is disturbed and a space is easily created using "Factors of objective game situation." Winning team must use punts in that space with appropriate individual decision-making. • Restart is influenced by "Factors of team tactics," "Factors of individual decision-making," and "Factors of objective game situation." • Restart is disadvantageous in terms of territory, hence punts for regional recovery are often used in team tactics. In addition, the opponent team often lowers backwards to receive a punted ball and several advantageous situations occur outside with respect to "Factors of objective game situation" and a kicking pass can be used under "Factors of individual decision-making." • Pen & FK are influenced by "Factors of individual decision-making," i.e., there could be a mistake in individual decision-making. • In spite of aiming for scoring a try by possessing a ball by the so-called "surprise attack," a quick tap is considered to be a situation where it is difficult to score and eventually punts have to be used. Therefore, it is mistake in individual decision-making. 	<ul style="list-style-type: none"> • Turnover has a large influence on the "Factors of game structure." The winning team has a strong ability to win turnovers and the number of turnovers. • Restart also has a large influence on the "Factors of game structure." This is because the winning team could get more tries than the losing team, and they could have more restart opportunities. • The reason why a losing team does not use punts in the restart is the absence of a player who has a high ability to achieve individual tactics, and the lack of a good kicker and defense ability. • In restart, it is effective to use a punt, but it is important to select an attack with respect to the formation of the opponent team under "Factors of objective game situation." Tactical achievements other than punts such as attack power are important. • In many cases, Pen & FK could continue the ball by finding a space, but the final use of punts is due to the inability to score. This is a mistake in decision making, i.e., there is an influence of "Factors of individual decision-making."
Rucks/Mauls (R/Ms)	<ul style="list-style-type: none"> • Significant differences in 1 R/Ms are largely affected by "Factors of team tactics" intended for the next phase. It is also expressed as "preparation." • Specifically, a ruck is intentionally made at a position where the kicker can be easily used. Therefore, team tactics other than punts are also required. • In 2 R/Ms +, there is also the effect of the "Factors of individual decision-making," which uses punts based on the predecessor of the gainline depending on the degree of attack. • In the case of own area, team tactics, such as "One Ruck One Kick" can help individual decision-making. • Team tactics other than punts include ruck formation ability, blocking of opponent kick charge players, blocking play, and defense pressure ability. 	<ul style="list-style-type: none"> • Regardless of the area, the influence of "Factors of team tactics" intended for the next phase is large. It is expressed as "assembly." • The team's tactical element other than punts in subsequent 1 R/Ms indicates the defense pressure ability. In addition, a space for "Factors of objective game situation" is generated by raising and lowering the opponent winger."
Position	<ul style="list-style-type: none"> • Punts from Scrum Half on the 'own' side and those from the Fly Half on the opponent's side can use the punt with respect to the "Factors of position characteristics." • Players of the 'own' side often use a base-recovered kick or a contested kick as a team tactic with respect to "Factors of team tactics." Scrum Half are characterized by their ability to be used effectively because they can play ahead of the Fly Half and generate less kick charge pressure from opponents, which is part of "Factors of position characteristics." • On the opponent side, it is often used as a "Factors of individual decision-making." The Fly Half-position characteristics show that it is easy to recognize the space behind because it plays behind the Scrum Half, and it is easy to determine the type of punts and trajectory. • When using punts from Scrum or Lineout, it should be used in consideration of the situation of play and preparation of kick-chase defense. 	<ul style="list-style-type: none"> • The reason why there are many punts from the Scrum Half was largely due to tactics other than kicks, which are considered to be dominant on the attack gainline. • If the attack gainline is dominant, the defense must go back, so as to not often come forward in the next phase, reducing the pressure on the Scrum Half. In addition, the opponent's Winger has to join the defense line, and there is a space behind for "Factors of objective game situation." • As a great Fly Half, it is said that in a team tactic intended for the next phase, a player can select to punt according to individual decision-making.

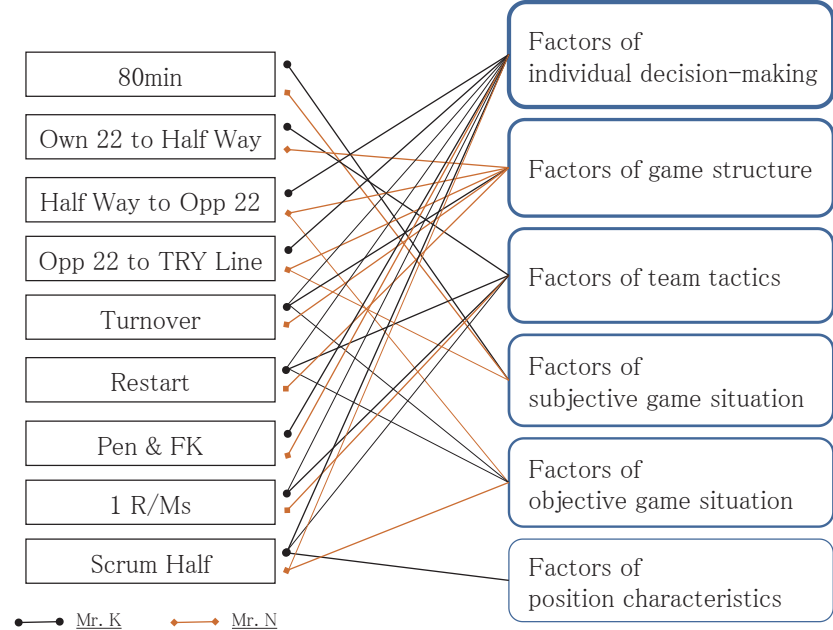


Figure 2 Relationship between interpretation and concept

characteristics (factors that depends on position characteristics)".

Quantitative approach

3.1. Quantitative analysis items that support the qualitative results

Based on the results of the qualitative research, we set five quantitative analysis items.

First of all, the difference in utilization between wining and losing teams during the 60-80 minute mark (80 min) can be considered to be largely

influenced by subjective factors regarding the game situation, including how impatient the players are and how much pressure is caused by the score difference; thus, we calculated the point differences between winning and losing teams in accordance with the game's time zones (Table 2). Next, it was pointed out that the differences in utilization between winning and losing teams on their "Own 22 to Half Way", "Half Way to Opp 22", and "Opp 22 to Try Line" rely on the differences in the type of punt kicks used in each area, so we calculated the type and quality of the punt kicks (Table 2, Figure 3). Then, since the differences in utilization between winning and losing

Table 2 Items and definitions of quantitative analysis

Categories of analysis			Additional explanations of definitions
Point difference between winning and losing	20 min		Point difference at 1st 20 min.
	40 min		Point difference at half time.
	60 min		Point difference at 2nd 20 min.
	80 min		Point difference at the end of the game.
Types of punts	Long kick	Purpose: To gain area	To gain area on own side.
	Area kick		Try to kick out to touch above your own 22m line.
	High punt		A punt that is kicked as high and long as possible.
	Short punt	Purpose: To regain ball possession	A punt that is kicked behind the defense line, as low as possible.
	Grubber kick		A punt during which the ball is rolled to a space.
	Kick pass		Passing the ball to your own player.
Quality of punts	Effective		The quality is evaluated as effective or ineffective. Details in Figure 3.
	Ineffective		
Ratio of punts	Turnover		A ratio of used punts when turnovers have occured in scrums, lineouts, and general plays. It does not include turnovers by punt, which serve to gain area.
	Restart		A ratio of used punts received during kick off or drop out.
Area of punts by Scrum Half	Own 22		Area from own goal line to own 22m line.
	Own 22 to Halfway		Area from own 22m line to the halfway line.
	Halfway to Opp 22		Area from halfway line to opponent's 22m line.

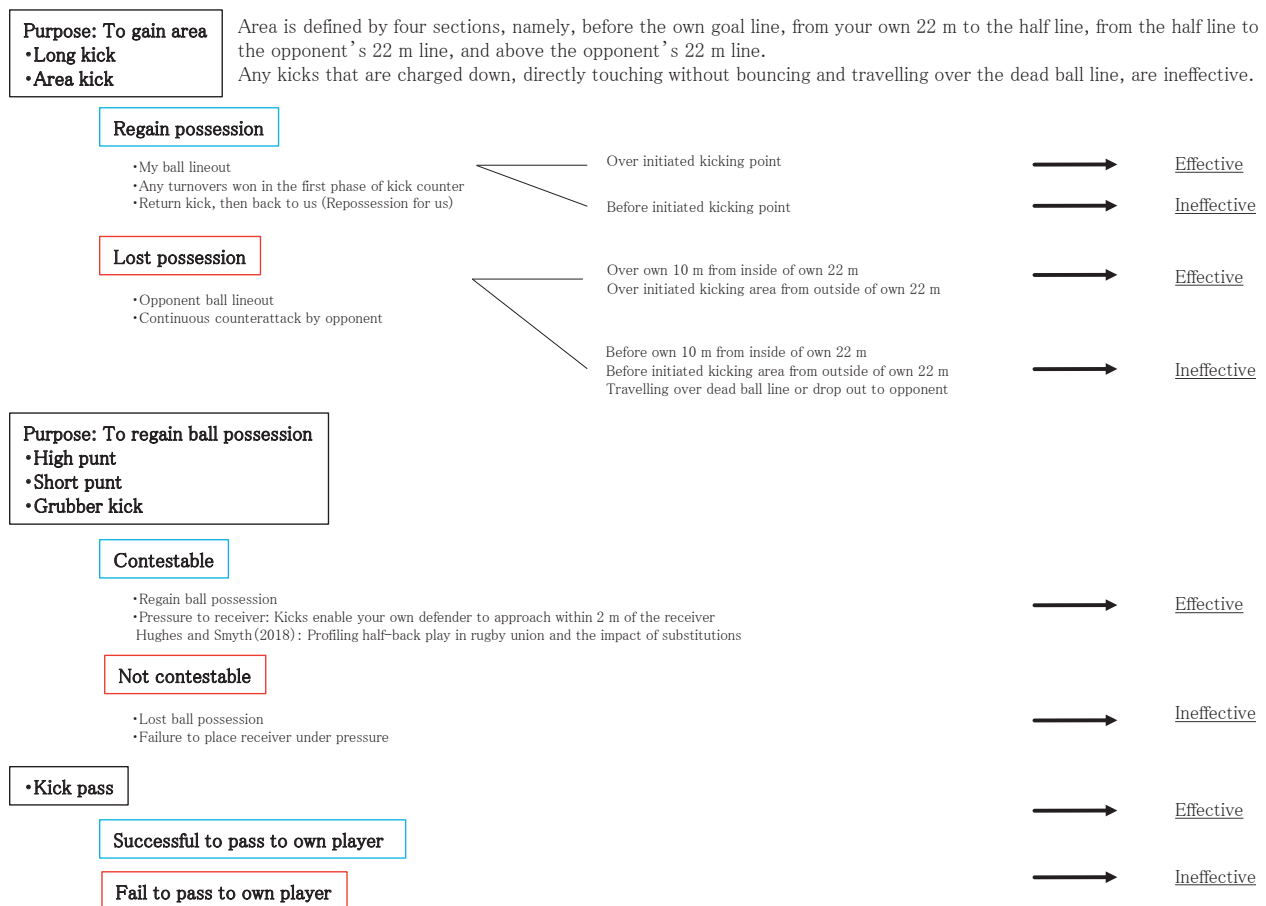


Figure 3 Definitions of qualitative punt kicks

teams in "Turnovers" and "Restarts" are considered to be influenced by these parameters, which were the amounts at the starting point, we calculated those parameters to obtain the ratio of utilization. Finally, in the utilization from "scrum-halves", the areas that were assumed in the interpretation were different in both of them, so we limitedly calculated the areas in which punt kicks were used by scrum-halves.

3.2. Statistical processing method for quantitative results

We compared the types of punt kicks, the areas in which the kicks were used by scrum-halves, as well as the number of punt kicks between the winning and the losing teams using an unpaired T-test. We performed a Pearson's chi-square test on the quality of the punt kicks and the proportion of the punt kicks used when "turnovers" and "restarts" happened. The significance level was set to 5% (two-sided test).

3.3. Results of the quantitative approach

First, **Figure 4** shows the differences in points scored between winning and losing teams. Next, the types and qualities of punt kicks are shown in **Table 3**, and the proportion of punt kicks used when "turnovers" and "restarts" happen is shown in **Table 4**. Finally, **Table 5** shows the areas in which punt kicks were used only by scrum-halves.

4. Considerations

4.1. Time zone: during the 60-80 minute mark (80 min)

Significant differences in the use of punt kicks can be seen only during the 60-80 minute mark (80 min). Both of the interviewees thought that it was largely influenced by the mental pressure that players felt. The results of the quantitative approach clarified that the winning team already had a 14.35 point difference on average at 60 minutes, and there was

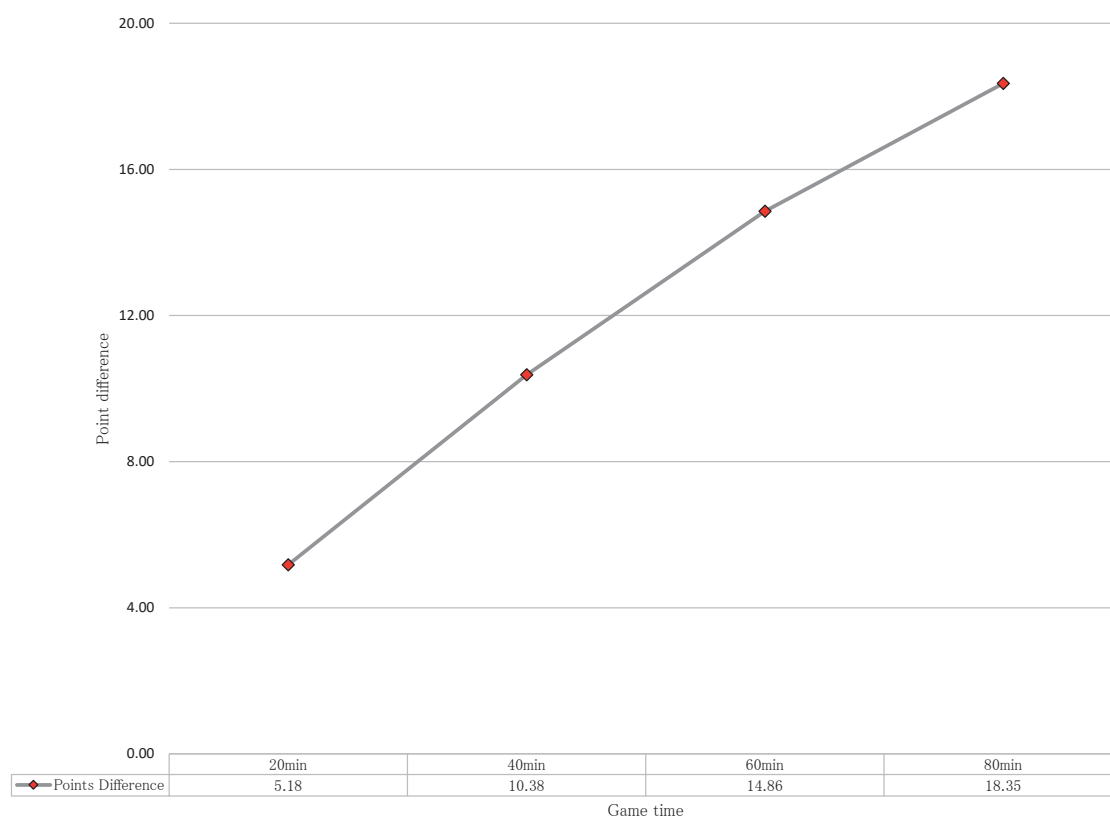


Figure 4 Point difference between winning team and losing team per game time

Table 3 Results of type and quality of punts

	Winning Team (n=119)			Losing Team (n=119)			t-test		Chi-square test	
	MEAN	SD	Quality(%)	MEAN	SD	Quality(%)	t	p	χ^2	p
Long kick	10.88	3.90	53%	10.86	4.12	46%	0.05	0.96	12.39	**
Area kick	2.54	1.92	62%	1.92	1.58	55%	2.73	0.01	**	2.15
High punt	3.80	2.42	48%	3.27	2.32	49%	1.72	0.09	0.11	0.74
Short punt	1.34	1.33	47%	1.20	1.02	42%	0.88	0.38	0.83	0.36
Grubber kick	1.87	1.66	38%	1.22	1.22	34%	3.47	0.00	**	0.50
Kick pass	0.61	0.82	39%	0.33	0.67	33%	2.88	0.00	**	0.34

** : p<.01 * : p<.05

Table 4 Results of punts ratio in Turnover and Restart

	Winning Team			Losing Team			χ^2	p
	numbers of Turnover	punts in Turnover	ratio	numbers of Turnover	punts in Turnover	ratio		
Turnover	1009	501	50%	843	383	45%	3.28	0.07
Restart	693	499	72%	500	314	63%	11.34	7.59

** : p<.01 * : p<.05

Table 5 Results of punts by Scrum Half in Area

	<u>Winning Team</u> (n=119)		<u>Losing Team</u> (n=119)		<u>t-test</u>	
	MEAN	SD	MEAN	SD	t	p
Own 22	0.87	1.09	0.89	1.18	-0.11	0.91
Own 22 to Halfway	1.95	1.80	1.61	1.64	1.54	0.13
Half Way to Opp 22	0.71	0.96	0.36	0.56	3.38	0.001 **
Opp 22 to Try Line	0.10	0.33	0.02	0.13	2.59	0.01 *

** : p<.01 * : p<.05

only one match in which a team that was losing after 60 minutes came back to win. As a result, players on the losing teams were "impatient" due to the short time remaining and the difference in points, and they choose tactics centered on "possessing the ball". They attempted to continuously possess the ball to score more points; thus, they were less likely to use punt kicks. On the other hand, the winning team was in the lead at this time, which was mentally easier and reduced the need to try scoring from a disadvantageous position. They chose tactics centered around "holding territory" to gain an advantageous territory position even if it meant giving the opponent possession of the ball; thus, it is thought that their use of punt kicks increased. Nakagawa (1983) regarded the situation in the game as the sum (mixture) of stimuli that affect players in the game, furthermore, he distinguished them between factors of subjective game situations and factors of objective game situations. He defined the factors of subjective game situations as "factors that do not exist as objective entities right in front of our eyes, but they do exist as subjective entities based on the result of the game", and he also mentioned the power relationship with the opponent. The mental pressures the interviewees talked about can be identified as "factors of subjective game situations".

From the above, the significant differences between the winning and losing teams in the use of the punt kicks during the 60-80 minute mark (80 min) were largely caused by the influence of the "factors of subjective game situations"; thus, it cannot be said that punt kicks used during the 60-80 minute mark (80 min) were effective punt kicks.

4.2. Areas, which are the "Own 22 to Half Way", "Half Way to Opp 22", and "Opp 22 to Try Line"

From their interpretations, it was considered

that there were influences from the following four concepts: "Factors of team tactics", "Factors of individual decision-making", "Factors of subjective game situations", and "Factors of game structure".

First, we will examine the viewpoint of the "factors of team tactics". Mr. K states that one of the "factors of team tactics" is to correctly select which kick is the most useful in a given position on the field, and carry it out. For example, if the team is behind their Own 22, a long kick will be used to recover territory, and if they are between their Own 22 to Half Way, a contest kick is used to try to obtain the ball. Here, we focus on contest kicks in a team's "Own 22 to Half Way" as illustrated. **Table 3** shows the results in which we calculated punt kicks by type and compared the number of times they were used between winning and losing teams. It was shown that high punts were used most frequently during contest kicks; however, there were no significant differences between winning and losing teams (winning team: 3.80 times, losing team 3.27 times, $t = 1.72$, n.s.). Therefore, it is considered that of the significant differences between winning and losing teams, the utilization of punt kicks between a team's "Own 22 to Half Way" was not largely affected by high punts. Therefore, "Factors of team tactics" were not supported by the quantitative results. However, the quality of the punts was calculated together with the type of punts (**Table 3**), and a significant difference was observed in long kicks (winning team: 53%, losing team 46%, $X^2 = 12.39$, $p < .01$). From this, although there were no quantitative differences in the number of times these punts were used, it can be said that when using punt kicks, the winning teams were more likely to effectively use long kicks.

Next, we will examine the viewpoint of "factors of individual decision-making". **Table 3** mentioned above shows that there were quantitatively significant differences between winning and losing teams in area

kicks, grubber kicks and kick passes. (Area kicks -- winning team: 2.54 times, losing team: 1.92 times, $t = 2.73$, $p < .01$. Grubber kicks -- winning team: 1.87 times, losing team: 1.22 times, $t = 3.47$, $p < .01$. Kick passes -- winning team: 0.61 times, losing team: 0.33 times, $t = 2.88$, $p < .01$). First, in this study, we defined an area kick as "a kick aimed at landing outside the touch line past their own 22". So, they are limited to punt kicks made past their own 22m, and they are often used through individual judgment after a player notices an opening in the field and correctly judges the situation. In this regard, they have something in common with grubber kicks and kick passes. Grubber kicks are used for the space behind the defensive line, and kick passes are used to pass the ball to a teammate who is far beyond the reach of a hand pass. In this way, all punt kicks are frequently used through an individual's judgment regarding certain situations. Therefore, it was also quantitatively shown that the significant differences in the team's "Own 22 to Half Way", "Half Way to Opp 22", and "Opp 22 to Try Line" are largely influenced by "factors of individual decision-making". Specifically, the good use of area kicks, grubber kicks, and kick passes is a characteristic of winning teams' punt kicks, and it is presumed that this leads to the effective use of punt kicks.

Next, we will examine the viewpoint of "factors of subjective game situations". According to Mr. N's interpretation, punt kicks especially in the "Half Way to Opp 22" and "Opp 22 to Try Line" areas were influenced by "factors of subjective game situations", which were the results of easier decision-making due to the team having the lead. The winning team is often superior in offense around the gain line (Van den berg and Malan, 2010), as well as with possession of the ball (Van Rooyen and Noakes, 2006). In such a development, it can be expected that the winning team will often gain an advantage when the opponent team commits a penalty when entering their opponent's territory and continuing their attack *¹. In this circumstance, the players on the winning team can choose to gamble more with their game-play decisions, including making kick passes, and consequently this leads to an active utilization of kicks in their opponent's territory. From the actual game aspect, the use of punt kicks for their advantage was performed 58 times by the winning team and 39 times by the losing team. Therefore, it is presumed that one of the "factors of subjective game situations"

was easier game-play decision-making due to their gaining a score advantage, which promoted the use of punt kicks by the winning team from their "Half Way to Opp 22" and "Opp 22 to Try Line".

Finally, we will examine the "factors of the game structure". The winning team is superior in offense and defense at around the gain lines and with possession of the ball; however, in addition to this, Mr. N says that the winning team has more chances and time to play in their opponent's territory, so the number of times they use punt kicks relatively increases. In recent reports, regarding players' chances and possession time in their opponent's territory, it has been pointed out that the winning team is not necessarily higher than the losing team in the possession index which indicates the time of possession and the territory index which indicates superiority in territory. From this, it cannot be said that the winning team has more chances and possession time in their opponent's territory (Ungureanu et al., 2019), thus, it can be considered that the influence of the "factors of the game structure" is small.

From the above, the quantitative significant differences between the winning team and losing team with punts from their "Own 22 to Half Way", "Half Way to Opp 22", and "Opp 22 to Try Line" are derived from "factors of individual decision-making" and "factors of subjective game situations". Specifically, they were caused by frequently used area kicks, grubber kicks, and kick passes, and using those punt kicks is a characteristic of the winning team, which may lead to the effective utilization of punt kicks.

4.3. About the starting point of the play, "turnovers" "restarts" and "quick taps"

First of all, regarding "turnovers", both of the interviewees pointed out that winning teams have a better defense than losing teams, so the number of turnovers generated is relatively large, and the influence of "factors of the game structure" is also large. Here, we compared the utilization ratio of punt kicks from "turnovers" based on the results of the quantitative approach, and we found that there were no significant differences between the winning and losing teams (winning team: 50%, losing team 45%, $X^2 = 3.28$, n.s.) In other words, it was confirmed that the winning teams had a larger parameter of

turnovers, so there were relative differences in the number of kicks in those situations. Furthermore, turnovers are a "transition" phase in which possession of the ball changes,

and offensive and defensive formations are largely altered, so spaces are often created behind the defensive line ("factors of objective game situations"). Furthermore, Nakagawa and Hirose (2005) claimed that it was effective to continue attacking while possessing the ball during turnover phases in close games. In their interpretation, the players on winning teams are able to properly notice a space, make appropriate judgments, and tactically use punt kicks. In other words, the influence of "factors of accurate individual decision-making" were also pointed out here, and it is thought that such high ability is a characteristic of excellent players.

The interpretation for "restarts" was different between the two interviewees. First of all, a restart happens when an opponent kicks from the half line, and the team receiving the kick gains possession of the ball about 80% of the time (Nakagawa, 2006), and that will be their offensive starting point, starting from their area. Thus, as a team tactic, Mr. K decides in advance which kick to use to recover territory. He focuses on "factors of team tactics", saying that performing it without making a mistake would result in significant differences. Furthermore, during the restart, the defensive team increases the number of players placed behind the defensive line in preparation for a punt kick from the attacking team, causing the defensive line to be thinner. He thinks that players can accurately judge these situations and find a good space to capture by using kick passes. On the other hand, Mr. N said that restarts are the starting point where play is initiated at the start of the first and second half and after scoring (World Rugby, 2020), so he pointed out the influence of the "factors of game structure", where the winning team often accumulates more points and has a relatively large number of restart opportunities. In order to verify this, we calculated the utilization ratio of punt kicks in consideration of the parameter at the restart, and it became clear that utilization among winning teams was significantly higher (winning team: 72%, losing team: 63%, $X^2 = 11.34$, $p < .01$). From this, it was found that the ratio was significantly large among winning teams even when the parameter of restarts itself was taken into consideration, and that the punt kicks were used in those situations. Therefore, as Mr.

K thinks, the winning team has set purposeful kicks to recover territory in advance for use in restarts. Thus, it was understood that they actually performed as so, and that led to quantitative differences in "restarts". In other words, during a "restart", it is highly possible that the effective use of punt kicks can be achieved by setting in advance the use of punt kicks as a team tactic, which allows them to recover territory.

Finally, a large number of punt kicks used by losing teams during "quick taps" was attributed to mistakes in tactical judgment of the situation; thus, both interviewees agreed that they were influenced by "factors of individual decision-making". A "quick tap" is used when starting play after a penalty kick or a free kick with a tap kick, and it is for a "quick attack". Originally, they were designed to score a try by taking advantage of the disturbed defensive line caused by the opponent's absence or carelessness; however, it was reported that the frequency that tries are scored from the starting point is the lowest (Shimozono et al., 2011). Among losing teams, although they attempt to score a try through a quick attack, they often are not completely able to penetrate the opponent's defense, and thus, they could not help using punt kicks. Both of them agreed that, as a result, there were significant differences in using punt kicks during quick taps (**Table 1**). Therefore, the use of punt kicks during quick taps was due to an individual's misjudgment of the game situation, and they might be less effective.

From the above, it became clear that there are significant differences between winning and losing teams in "restarts", even when we consider the ratio of utilization; thus, in this situation, it is highly possible that punt kicks can be effectively used by setting their use in advance as a team tactic.

4.4. 1 R/Ms (Ruck and Mauls)

Regarding Ruck/Mauls, there were significant differences in the use of kicks in the 1 R/Ms. In this regard, the winning team is influenced by the "factors of team tactics" intended for the next ruck and maul, which is considered to consist of three tactical performance capabilities. First, being intended for the next R/Ms refers to the play considering next R/Ms, and in the 0 R/Ms it refers to the formation of a ruck at an appropriate angle in 1 R/Ms so that the ball will be outside the touch line when a punt kick is used. Winning teams understand which position is easy for a player to use a punt kick from, and they form a

ruck accordingly and hold the ball securely. Winning teams have the tactical ability to do this properly and accurately. The second tactical performance is to consider when to assign a player to block a player who is trying a kick charge*². In rugby competition, whether the punt kick comes from a set play or not, such as from a scrum or a line-out, or an attack from a ruck, differs greatly from the viewpoint of the regularity of the placement of forward players. In particular, in scrums and line-outs, the starting point is a place where the forward players are stuck, so punt kicks should be used after considering the number of blockers. Furthermore, being related to the third factor, it is necessary to consider the number of kick chase defenses after the punt kick is used. As the third tactical performance ability, both of them mentioned having a good defense. In order to make it possible, it is necessary to arrange a sufficient number of players on a kick chase line*³. "Non-kicking team tactical performance abilities" are composed of these three tactical performances. Since they are performed in the 0 R/Ms, which is the previous phase, it is thought that the number of punt kicks increases in the 1 R/Ms. In addition, both of them expressed their tactical performance and play in the 0 R/Ms as "preparations" or "assemblies", respectively.

From the above, the significant differences in the utilization of punt kicks between the winning and losing teams in 1 R/Ms was not caused by the fact that the punt kicks in that situation were effective. It was caused by the better "Non-kicking team tactical performances" of the winning team, and this indicates that in order to make the use of punt kicks more effective, "preparations" and "assemblies" in the previous phase were important.

4.5. The position of "Scrum-half"

Finally, significant differences were confirmed in punt kicks made by scrum-halves, but its interpretations were different between the two interviewees. First, Mr. K mentioned that they were greatly influenced by the use of punt kicks in their own territory. In many cases, teams use long kicks for gaining territory, as well as high punts for regaining possession of the ball as a team tactic. This is because the kicking position is ahead of the stand-off because of their physical location, so it is an efficient way to gain more distance, and the pressure from the opponent team's defensive players is less

than that against the stand-off. Also, in the opponent's territory, because the pressure from the defense against the scrum-half is strong, and the stand-off is positioned behind the scrum-half, he can gain more visual information, and it takes longer for him to recognize the game situation, so he thinks punt kicks made by players other than the scrum-half are better. From the above, Mr. K thought that the significant differences in scrum-halves on winning teams is greatly influenced when punt kicks were used in his own territory. On the other hand, Mr. N thought that "factors of individual decision-making" and "factors of objective game situations" have a large impact regardless of where the team is on the field. It is considered that winning teams are also superior in offense and defense around the gain line (Van den berg and Malan, 2010), and it is expected that defending teams are often forced to retreat. Therefore, the pressure from the defense on the scrum-half is reduced, and it will be easier for the scrum-half to use punt kicks. Furthermore, players located behind the defensive line merge with the defense and physical space is created that also affects individual situational judgments, which may attribute to the increases in the number of punt kicks made by scrum-halves. Since the interviewees had different opinions on where punt kicks were used, the quantitative approach was limited to scrum-halves, and we investigated the position on the field where punt kicks were used (**Table 5**). The results showed significant differences in punt kicks made by scrum-halves, which were "Half Way to Opp 22" (winning teams: 0.71 times, losing teams: 0.36 times, $t=3.38$, $p < .01$) and "Opp 22 to Try Line" (winning teams: 0.10 times, losing teams: 0.02 times, $t = 2.59$, $p < .05$). This shows that significant differences in the utilization of punt kicks in the winning team occurred when they used them in their opponent's territory, so Mr. N's interpretation on the premise of the opponent's territory was more supported. In other words, the reason that there were significant differences between winning and losing teams in the use of punts by scrum-halves can be interpreted as follows: due to the superiority in offense and defense at the gain line, space was created when pressure to the defense caused by kicking was reduced, or defensive players located behind were moved forward and backward. Thus, the situation was judged correctly and punt kicks were used.

From the above, it became clear that the significant differences between winning and losing teams in

the use of punt kicks made by "Scrum-halves" were attributed to plays that occurred in the opponent's territory, and there the influence of "factors of individual decision-making" was large. In addition, when they were superior in offense and defense at the gain line, they had more chances to use punt kicks in their opponent's territory, which might have led to them performing more effective punt kicks. We hope these findings will help scrum-halves who need to make frequent situational judgments (James et al., 2005) when determining a situation.

5. Conclusion

In this study, in order to obtain qualitative knowledge about the effective use of punt kicks in rugby competition, we conducted an interview survey with athletes who belonged to domestic top-level leagues. Furthermore, we deepened the interpretation of qualitative research by conducting a quantitative analysis to support qualitative results. The findings on effective punt kicks revealed in this study were as follows:

- One of the characteristics of winning teams is that they can use area kicks, grubber kicks, and kick passes past their own 22m, and it is highly possible that this leads to more effective punt kicks.
- Although there are no quantitative differences, the high quality of long kicks is one of the characteristics of a winning team, which leads to more effective use of punt kicks.
- In "Restarts", it is highly possible that punt kicks are more effective when they are set in advance as a team tactic, and the team follows through with that.
- Punt kicks made by scrum-halves are more likely to be widely used when the team has an advantage in offense and defense at the gain line in their opponent's territory, and it is highly possible that they will be effective punt kicks.

Accumulating such knowledge will not only lead to new elucidation of aspects related to the utilization of punt kicks in rugby competitions, but it can also help create team tactics for players as well as instructors when coaching. Furthermore, it can help examine the situation in individual tactics. In the future, we will be able to obtain further qualitative knowledge by conducting interviews with athletes in various positions and expanding the range of interviewees to not only athletes but also instructors and referees,

which will be useful knowledge for the development of rugby competition and coaching.

Notes

1. If one team gains an advantage from an opponent's penalty, the referee allows players to continue playing without pausing the game.
2. Charging down the ball forward immediately after the opponent's player kicks the ball.
3. It refers to the front line defense close to the attacking side after a punt kick was made.

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