COMPARISON OF BALL-AND- RACKET IMPACT FORCE IN TWO-HANDED BACKHAND BETWEEN DIFFERENT DIRECTIONS OF STROKE

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INTRODUCTION: Modern rackets have facilitated a modification in playing style from one of technique to one characterized by power (Miller, 2006). The aim of this report is compare the impact force and moment of upper extremity joint between the advanced and the intermediate group during two-handed stroke in across-court and down-the-line. Based on a few studies in backhand stroke, especially the two-handed backhand with different direction, this study is essential for understanding stroke characteristics.

METHODS: This study recruits six right-handed male tennis players. All subjects use the two-handed backhand stroke. This study adopted a 3-D motion analysis system including 8 cameras (500Hz) for recording subjects' upper extremities to trace their motion in cross-court and down-and-line, respectively. The inverse dynamics model was employed for the calculation of the forces of the upper segment joints.

RESULTS:

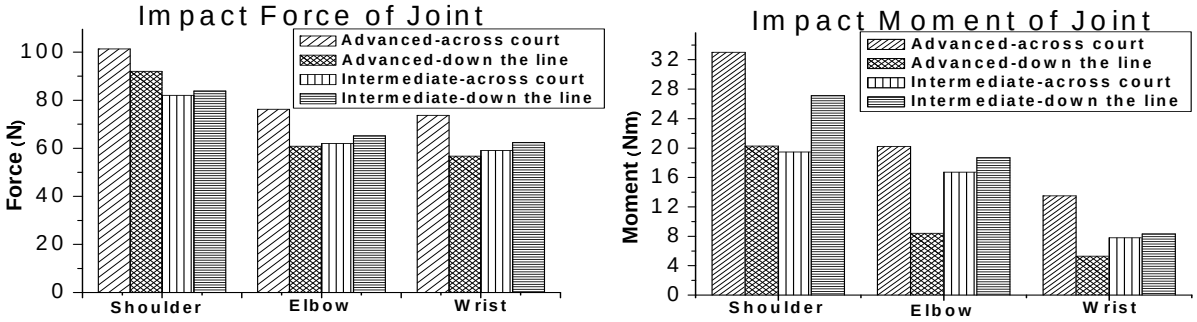

Figure 1: The joint impact force and moment between two directions of hit.

DISCUSSION: The result was found the force and moment of across-court was greater than down-the-line, it was possible that needed more trunk rotation (Reid & Elliott, 2002). In addition, the force and moment of intermediate with down-the-line were more than with across-court. It might apply more movement of elbow and wrist. Previous study found the lower level player had high risk of tennis elbow (Elliott, 2006), it was incidence with this study. One possible reason for the inconsistent result between advanced and intermediate groups may be the cause of the instable technique of intermediate group.

CONCLUSION: These findings confirm that the level of players and the different direction of stroke had difference of impact force and moment.

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