

GROUND REACTION FORCE ANALYSIS FOR DIFFERENT FEET POSITION IN BASKETBALL DEFENSIVE-SHUFFLE

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INTRODUCTION: There are several steps for defending in basketball competition. Defender must shuffle toward lateral rear to defend. We want to understand how the different defensive steps works when defence. The purpose of this study was to collect the ground reaction force while defender shuffling toward lateral rear to find the differences of the different feet position, which we can find the optimal strategy to stop opponent cutting and moving.

METHOD: Two force plates (Kistler, type: 9281, and 9287) sampling at 1200Hz were used to collect ground reaction force on both feet from three male basketball players (24.0 ± 2.4 yr, 177.5 ± 4.4 cm, 78.0 ± 7.8 kg). Four foot-switches were placed under both feet to identify when the foot leave from the ground. The subjects performed right or left rear movements at different foot position including two feet parallel, right foot in front and left foot in back, and left foot in front and right foot in back. Three trials of each movement were conducted in a random sequence. Ground reaction forces in the vertical (V-GRF) and horizontal (H-GRF) directions were considered as outcome measures to assess the differences between different defensive shuffled. No statistics was used because few subjects were included.

RESULTS AND DISCUSSION: The results showed that three players have similar performances in ground reaction force in both feet. The pivotal foot (non-leaving foot) had larger ground reaction forces (V-GRF peak value= 1.26 ± 0.05 BW, H-GRF peak value= 0.74 ± 0.06 BW) than non-pivotal foot (V-GRF peak value= 0.72 ± 0.2 BW, H-GRF peak value= 0.28 ± 0.14 BW). When the subject needed to rotate his body substantially, peak values of ground reaction forces both in vertical and horizontal directions in non-pivotal foot appeared before non-pivotal foot leaving force plate (-0.25 ± 0.05 sec). We consider that non-pivotal foot produced both ground reaction forces in vertical and horizontal directions before non-pivotal foot leaving ground in order to rotate body. After non-pivotal foot leaving ground, pivotal foot produced larger ground reaction forces to move body. Two peaks on curve or differences in shapes between two shuffling direction were found due to moving by domain leg or non-domain leg.

CONCLUSION: Ground reaction forces both in horizontal and vertical directions were different between three different feet position when subject shuffled right or left.

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