

Oral Communication Abstract

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Comparison of CT Volumetry vs Nuclear Renography to Predict Remaining Kidney Function After Uni-nephrectomy in Living Kidney Donors

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Objectives: Computed tomography(CT) and nuclear renography are performed to decide kidney procurement. The aim of this study was to compare single kidney(sk) function and single kidney(sk) volume in predicting post-donation kidney function. Further, we aimed to investigate which modality is more predictable for functional recovery, especially when the results were contradictory.

Methods: CT volumetry and nuclear renography from 835 kidney donors were retrospectively included. We investigated correlation between sk-volume and sk-mGFR and the agreement of two modalities. Mismatch was defined as sk-volume higher and sk-mGFR smaller than the other kidney, or vice versa. We compared the predictive value for post-donation kidney function between two modalities in total group and in mismatched group. Based upon decision preference, we compared kidney function recovery between two modalities at 6 months after donation.

Results: Mean baseline estimated GFR was 100.01ml/min/1.73m². The mean right and left sk-volume were 171.18 and 179.71cm³ and mean right and left sk-mGFR were 53.72 and 53.44ml/min, respectively. 701(83.96%) donated left kidney. Sk-mGFR and sk-volume showed significant correlation($r=0.484$, $P<0.001$) and the results showed significant agreement in Bland-Altman plot and Intraclass correlation coefficient was 0.647($P<0.001$). In total group, CT volumetry was superior to nuclear renography in predicting kidney function after donation(1 month: $\beta_{CT}=0.402$, $P<0.001$, $\beta_{renography}=0.242$, $P<0.001$; 6 months: $\beta_{CT}=0.448$, $P<0.001$, $\beta_{renography}=0.214$, $P<0.001$) by multivariable linear regression analysis. In mismatched group(326 donors), CT volumetry still outweighed nuclear renography(1 month: $\beta_{CT}=0.453$, $P<0.001$, $\beta_{renography}=0.259$, $P<0.001$; 6 months: $\beta_{CT}=0.480$, $P<0.001$, $\beta_{renography}=0.285$, $P<0.001$). When mismatch occurred, 260(79.75%) procurements were decided by nuclear renography. Functional recovery was higher in CT volumetry preferred group, although it did not reach statistical significance(33.99% vs 30.09%, $P=0.098$).

Conclusions: CT volumetry was appropriate to assess single kidney function and it outperformed nuclear renography in predicting kidney function after donation. Therefore, when contradictory results between left and right kidney occur, CT volumetry can be preferred in procurement strategy