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Residual renal volume as a long-term independent predictive factor of developing Chronic Kidney Disease after donor nephrectomy

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Objectives : To assess the long-term association between the residual renal volume and the progression of chronic kidney disease (CKD) in kidney donors following open or laparoscopic donor nephrectomy.
Methods : A retrospective observational study involving 452 individuals who underwent open or laparoscopic donor nephrectomy at Ramathibodi Hospital, Bangkok, Thailand. The study spanned over a comprehensive 60-month monitoring period. Residual renal volume was determined through Computer Tomography. Patient characteristics, surgical techniques, donated kidney side, and estimated glomerular filtration rate (eGFR) were collected and analysed.
Results : In a multivariate analysis, a residual renal volume exceeding 50% of original volume is associated with an increased likelihood of developing CKD, with a hazard ratio (HR) of 1.675 ($P<0.05$), and male gender has a hazard ratio (HR) of 4.013 ($P<0.001$). Additionally, age is identified as a minor risk factor for developing CKD, with hazard ratio (HR) of 1.107 ($P<0.001$).
Conclusions : higher residual renal volume, male gender, and older age were identified as independent risk factors for the development of CKD following open or laparoscopic donor nephrectomy during long-term follow-up.

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Table 4 Risk factor to CKD

Variable	Univariate		Multivariate	
	HR (95%CI)	p-value	HR (95%CI)	p-value
Gender				
Female	1		1	
Male	2.65 (1.81-3.85)	<0.001	4.01 (2.67-6.03)	<0.001
Age(year)	1.10 (1.07-1.12)	<0.001	1.11 (1.08-1.13)	<0.001
BMI	1.10 (1.02-1.12)	0.007	1.05 (0.99-1.11)	0.053
Operation type				
Open	1			
Laparoscope	1.53 (1.03-2.27)	0.035		
Renal volume (ml)				
% remain				
≤50%	1		1	
>50%	1.57 (1.05-2.36)	0.028	1.68 (1.09-2.58)	0.019

% remain = percentage of residual renal volume

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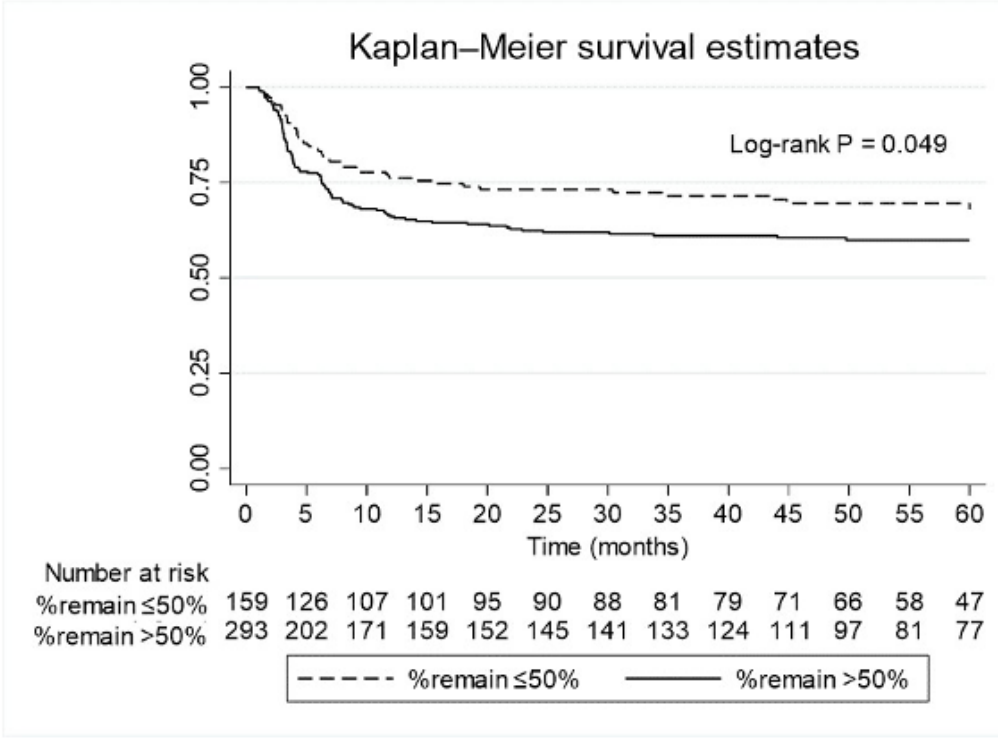
Figure 1 CKD development according to remnant kidney volume (>50 or <50%)



Remark : the Y axis shows cumulative incidence of CKD development over time