

How to prevent renal injury after EVAR

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Disclosure

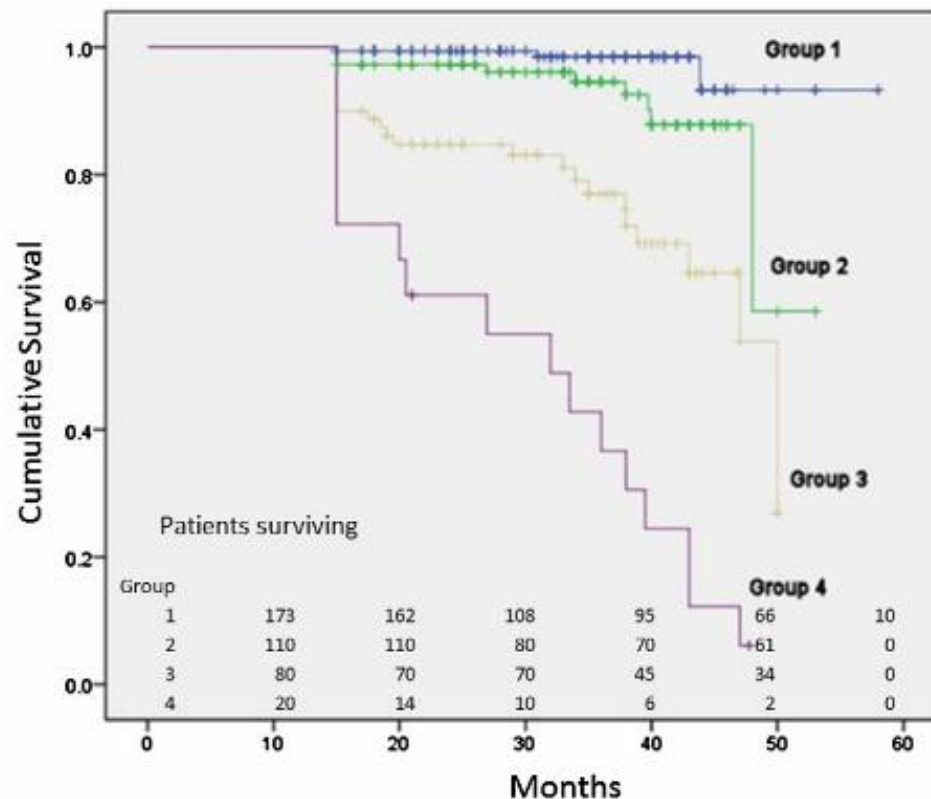
Speaker name: Hiroshi Banno

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- ☐ I have the following potential conflicts of interest to report:
- ☐ Consulting
- ☐ Employment in industry
- ☐ Shareholder in a healthcare company
- ☐ Owner of a healthcare company
- ☐ Other(s)
- ☒ I do not have any potential conflict of interest

Impaired renal function is associated with mortality and morbidity after endovascular abdominal aortic aneurysm repair

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J Vasc Surg 2013

www.cacvs.org

Acute Kidney Injury After Endovascular Repair of Abdominal Aortic Aneurysm

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Acute kidney injury (**AKI**) after any type of intervention **negatively impacts** mortality, length of hospitalization, and perhaps long-term survival.

J Endovasc Ther 2013

ORIGINAL ARTICLE

Chronic Kidney Disease and the Risks of Death, Cardiovascular Events, and Hospitalization

Alan S. Go, M.D., Glenn M. Chertow, M.D., M.P.H., Dongjie Fan, M.S.P.H., Charles E. McCulloch, Ph.D., and Chi-yuan Hsu, M.D.

An independent, graded association was observed between a **reduced e-GFR** and the **risk of death**, CV events, and hospitalization

N Engl J Med 2004

Strategy to preserve renal function after EVAR

For improving life expectancy

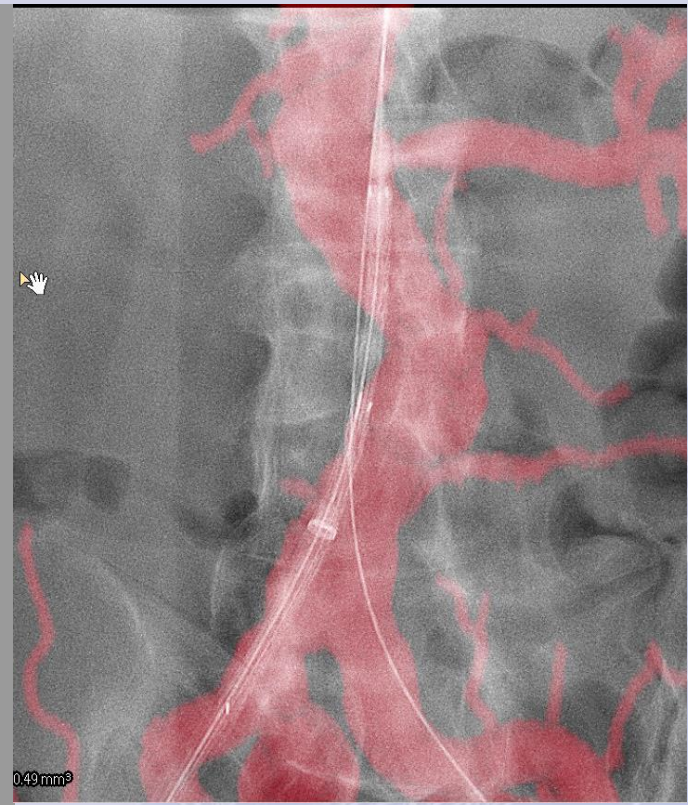
Renal dysfunction after EVAR

- Acute
 - Contrast-Induced-Nephropathy (CIN)
 - Renal artery occlusion
 - Embolism
- Long-term
 - CIN
 - Renal artery occlusion

Reduction of contrast volume

- High quality image
- Fusion image
- IVUS
- CO2

High quality & Fusion image



Hybrid OR

Mobile C-arm

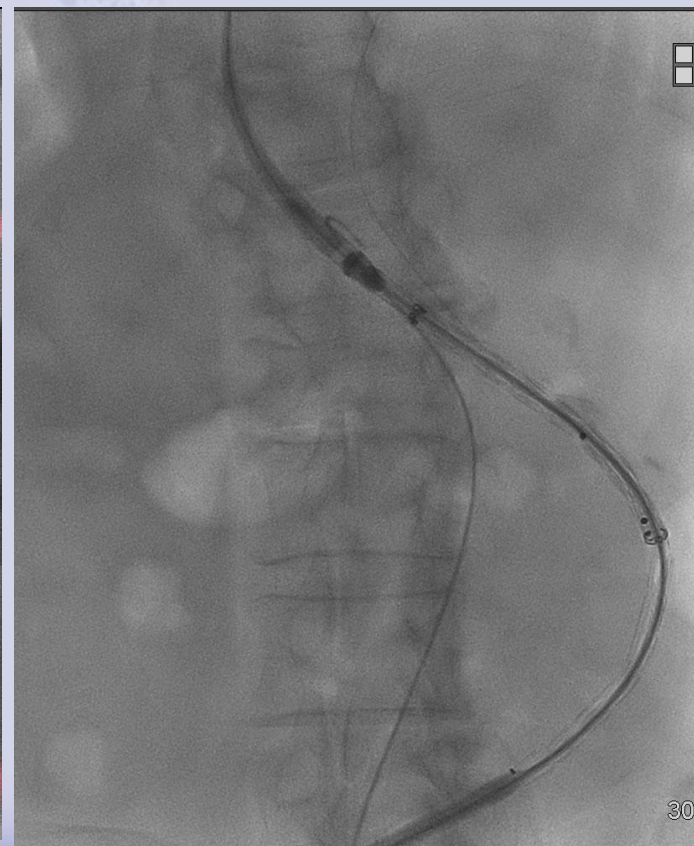
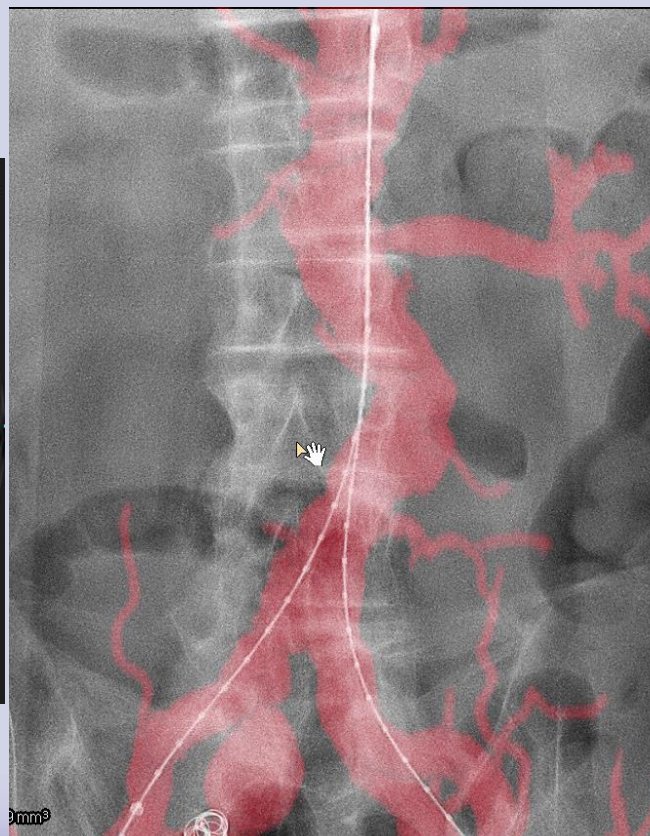
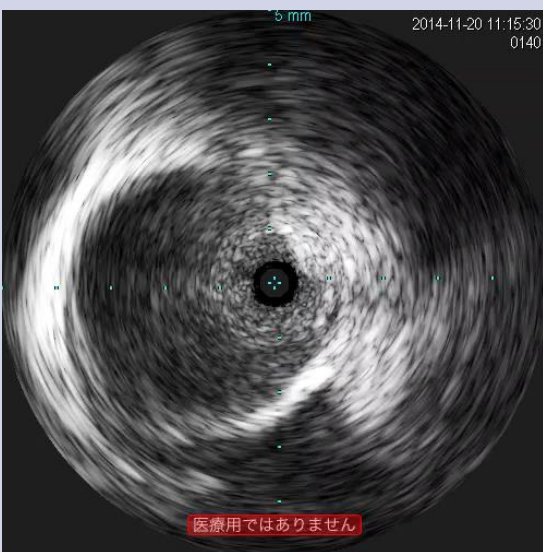
P value

Contrast volume (ml) 70.6 ± 35.2

108.0 ± 52.9

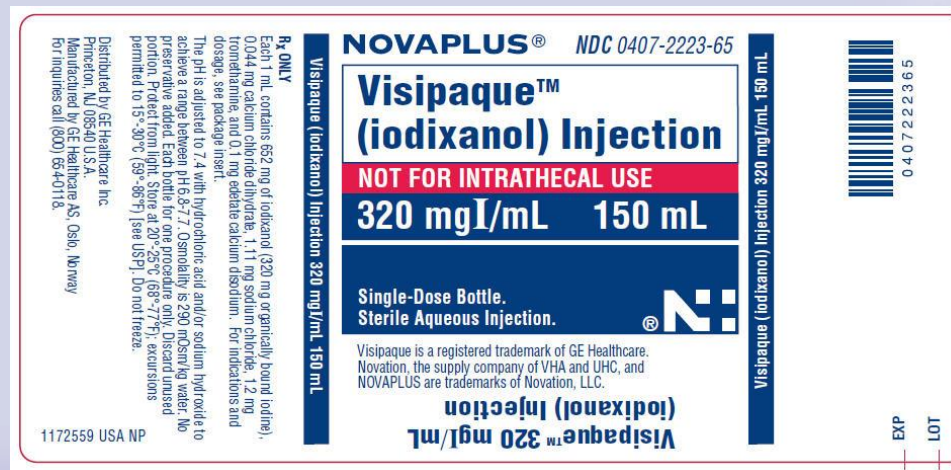
<0.0001

IVUS, CO2



Type of contrast agent

- Iodixanol (Grade 1B)
 - Only currently available iso-osmol nonionic contrast agent



Volume administration

- Volume expansion
 - By isotonic intravenous fluids prior to and continued for several hours after contrast administration (Grade 1B)
 - Sodium bicarbonate?? (Grade 2B)

Inhibition of vasoconstriction

- Avoidance of NSAIDs
- Withhold ACEI/ARB??

Statin

- May prevent CIN
 - Endothelial function, arterial stiffness, inflammation, oxidative stress
- May reduce microembolism to i.e. kidney

Contents lists available at [ScienceDirect](#)

Atherosclerosis

journal homepage: www.elsevier.com/locate/atherosclerosis

 ELSEVIER

Intensive lipid lowering therapy with titrated rosuvastatin yields greater atherosclerotic aortic plaque regression: Serial magnetic resonance imaging observations from RAPID study

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Suprarenal fixation??

- Currently available data are **insufficient** to determine the precise effect of suprarenal fixation on mid-term renal function
 - Walsh SR, J Vasc Surg 2008
- Suprarenal graft fixation in EVAR is **associated** with a decrease in renal function at 12 months
 - Saratzis A, J Vasc Surg 2012
- Proximal fixation type has **no significant** effect on both acute and chronic renal function
 - Pisimisis GR, Ann Vasc Surg 2013

PAPERS OF THE 133RD ASA ANNUAL MEETING

Comparison of Outcomes for Open Abdominal Aortic Aneurysm Repair and Endovascular Repair in Patients With Chronic Renal Insufficiency

*Bao-Ngoc Nguyen, MD, Richard F. Neville, MD, Rodeen Rahbar, MD, Richard Amdur, PhD,
and Anton N. Sidawy, MD, MPH*

Contrary to current practice, and despite the use of contrast, **EVAR** should be the first choice in patients with **moderate renal dysfunction**.

Risk classification

	Total	non-AKI group	AKI group	Pvalue
Pts No.	364	336 (92.3%)	28 (7.7%)	
Age (years)	77.9 ± 6.2	78.0 ± 6.0	76.4 ± 10.3	0.822
Diabetes Mellitus	37 (10%)	36 (10.7%)	1 (35.7%)	0.196
Coronary Artery Disease	111 (30%)	101 (33%)	10 (36%)	0.532
Pre eGFR (ml/min/1.73m ²)	60.2 ± 19.7	60.4 ± 20.2	57.1 ± 13.2	0.45
Regional anesthesia	27 (7%)	27 (8%)	0 (0%)	0.106
Suprarenal fixation	212 (58%)	193 (57%)	19 (68%)	0.283
Aneurysm diameter (cm)	5.2 (0.9, 3.0-9.0)	5.1 (0.9, 3.0-9.0)	5.4 (1.4, 4.6-8.0)	0.06
Contrast volume(ml)	100 (51, 8-330)	100 (54, 8-330)	113 (70, 65-245)	0.04
Blood loss(ml)	152 (190, 10-1874)	150 (183, 10-1874)	196 (317, 17-1763)	0.1
Op time(min)	144 (58, 66-484)	141 (53, 66-390)	196 (121, 84-484)	0.0001

	total	Group 1 (eGFR≥90)	Group 2 (60≤eGFR<90)	Group 3a (45≤eGFR<60)	Group 3b (30≤eGFR<45)	Group 4 (eGFR<30)	Pvalue
Pts No.	364	22	149	117	58	18	
AKI cases	28 (7.7%)	0	10 (6.7%)	13 (11.1%)	5 (8.7%)	0	0.311
Contrast volume (ml)	100 (51, 8-330)	99 (37.5, 40-200)	100 (57.5, 45-330)	105 (55, 45-260)	90 (70, 24-250)	45 (69.5, 8-160)	<0.0001
Op time (min)	144 (58, 66-484)	122 (41, 66-235)	141 (54, 69-339)	148 (62, 69-329)	152 (74, 68-484)	152 (43, 121-273)	<0.01

Prevention of Renal Injury after EVAR

- Risk classification
- Reduction of contrast volume
- Choice of contrast agent
- Volume administration
- Inhibition of vasoconstriction
- Statin
- Type of endograft (suprarenal fixation)??



Thank you for your attention