

Outcomes of fenestrated endovascular repair of juxtarenal aortic aneurysm

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Fenestrated endovascular repair for juxtarenal aortic pathology

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Objective: To evaluate the outcomes after fenestrated endovascular aortic repair (f-EVAR) in a tertiary European referral center.

Methods: All patients treated with commercially available custom-made f-EVAR between September 2002 and June 2007 were prospectively enrolled in a computerized database including co-morbidities and aneurysm morphology. Patients were retrospectively analyzed. Follow-up consisted of clinical examinations and computed tomography (CT) scanning.

Results: A total of 54 patients were included in this study. Median age was 72 (interquartile range [IQR] 68-76) years and 85% were men. Median preoperative aneurysm diameter was 60 (53-66) mm. One hundred thirty-four vessels were targeted (43 scallops, 91 fenestrations) and 96 stents were placed (69 bare, 27 covered). Target vessel catheterization was achieved in 98% of cases. Two patients (3.7%) died within 30 days, 1 from trash embolization and multiorgan failure and 1 from retroperitoneal bleeding caused by a renal artery perforation. Three type I endoleaks occurred intraoperatively, two sealed pre-discharge and one was treated with a Palmaz stent (Cordis, Miami Lakes, Fla) on postoperative day 4. Thirteen patients had type II endoleaks, and 2 required treatment. The median clinical follow-up was 25 (12-32) months with median CT follow-up of 22 (4-26) months. Aneurysm diameter decreased ≥ 5 mm in 47%, was unchanged in 50%, and increased ≥ 5 mm in 3% of patients at 1 year. There were three type II endoleaks at 1-year follow-up, one of which was successfully treated after 19 months due to aneurysm growth. Ninety-six percent of target vessels remained patent during the study period and all occlusions occurred within the first year of follow-up. Five target vessels occluded (2 renal arteries [RAs] and 3 superior mesenteric arteries [SMAs]) without symptoms during follow-up and successful reinterventions were done on 2 stenosed RAs. Three patients suffered creatinine increase but none needed dialysis. One late aneurysm-related death occurred due to massive bleeding during redo surgery for infection.

Conclusion: Despite complex anatomy or severe comorbidities in these patients f-EVAR has acceptable short- and midterm results in this series which includes a learning curve and offers a valid treatment alternative to patients unsuitable for standard EVAR or open repair. (J Vasc Surg 2009;49:568-75.)



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Objective: To evaluate late outcomes after fenestrated endovascular aortic repair (f-EVAR) in a tertiary European referral center.

Methods: In 2009, we published short- and midterm results after f-EVAR in the first 54 patients treated with this technique at our center between September 2002 and June 2007. In this paper, we provide long-term follow-up of the same patient cohort with the main focus on target vessel (TV) patency, renal function, reinterventions, and survival.

Results: A total of 54 patients were included in this study. Median age was 72 years (interquartile range [IQR], 68-76 years) at primary operation, and 85% were men. Median preoperative aneurysm diameter was 60 mm (IQR, 53-66 mm). One hundred thirty-four vessels were targeted (mean, 2.5 per patient), and 96 TV stents were placed. The median clinical follow-up was 67 months (IQR, 37-90 months), and computed tomography follow-up was 60 months (IQR, 35-72 months). Aneurysm diameter decreased ≥ 5 mm in $39\% \pm 7\%$ at 12 months, $64\% \pm 8\%$ at 36 months, and $71\% \pm 8\%$ at 60 months. Primary TV patency was $94\% \pm 2\%$ at 12 months, $91\% \pm 3\%$ at 36 months, and $90\% \pm 3\%$ at 60 months. Glomerular filtration rate decreased by 17% at 59 months (IQR, 26-73 months) follow-up (60 [IQR, 46-79] vs 50 [IQR, 38-72] mL/min/1.73 m²; $P < .001$), and one patient became dialysis-dependent secondary to a renal stent occlusion. Reintervention-free survival was $88\% \pm 5\%$ at 12 months, $69\% \pm 7\%$ at 36 months, and $56\% \pm 5\%$ at 60 months. At least one reintervention was done in 37% of patients, of which 29% were endoleak-related, 26% TV-related, 13% graft-limb-related, and 32% due to other causes. The majority of reinterventions (68%) were based on complications detected on routine follow-up. Estimated overall survival was $93\% \pm 4\%$ at 12 months, $76\% \pm 6\%$ at 36 months, and $60\% \pm 7\%$ at 60 months. In total, 54% of the patients died during the 10-year study period, where 9% died of aneurysm-related causes.

Conclusions: Long-term mortality after f-EVAR is high, but most patients die from nonaneurysmal causes. Aneurysm-related mortality is associated with technical complications that can be reduced with increased experience. Reinterventions are common, and most complications are detected on routine follow-up. (J Vasc Surg 2014;59:115-20.)



Long-term follow-up

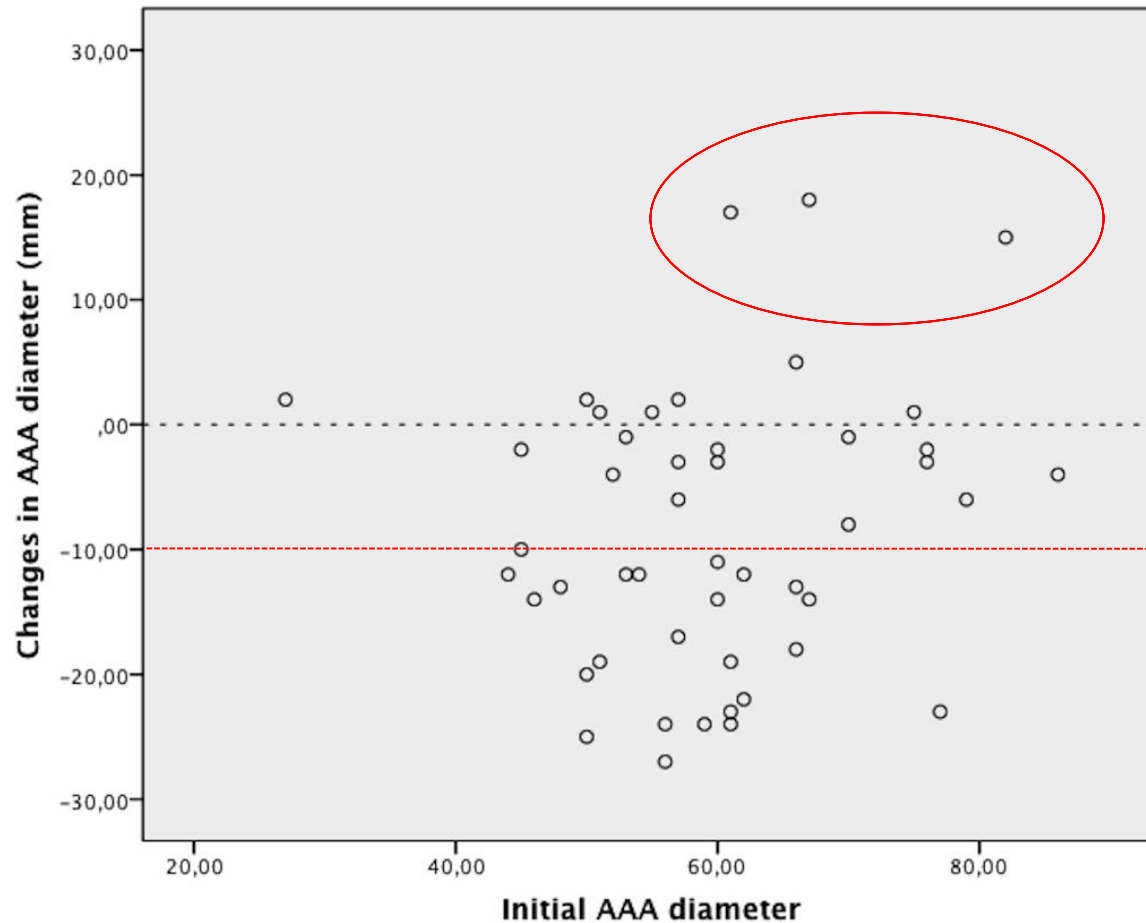
- Same patient cohort
- Clinical follow-up 67 months
- CT and GFR follow-up 60 months



Results



AAA diameter



Decrease ≥ 5 mm

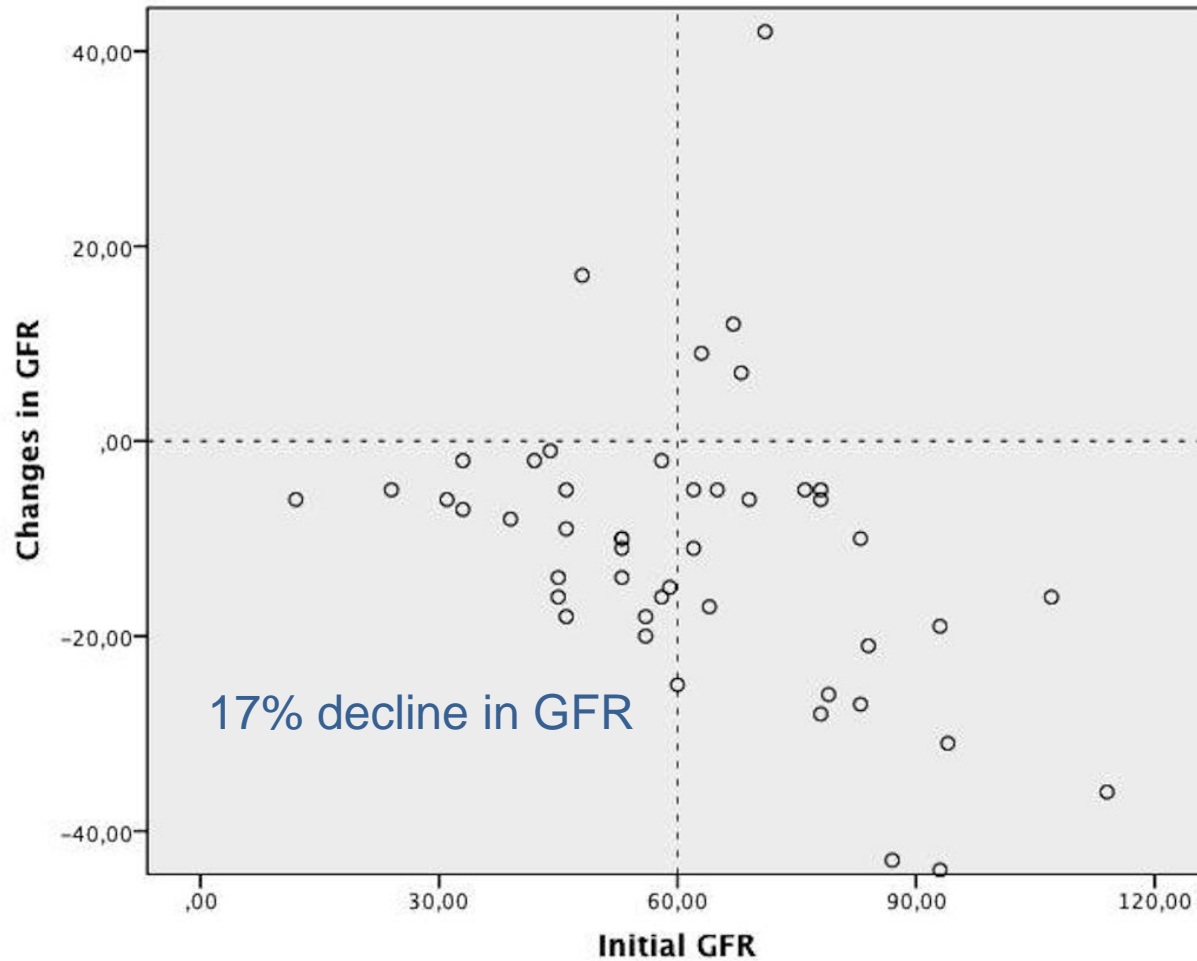
39% at 12 months

64% at 36 months

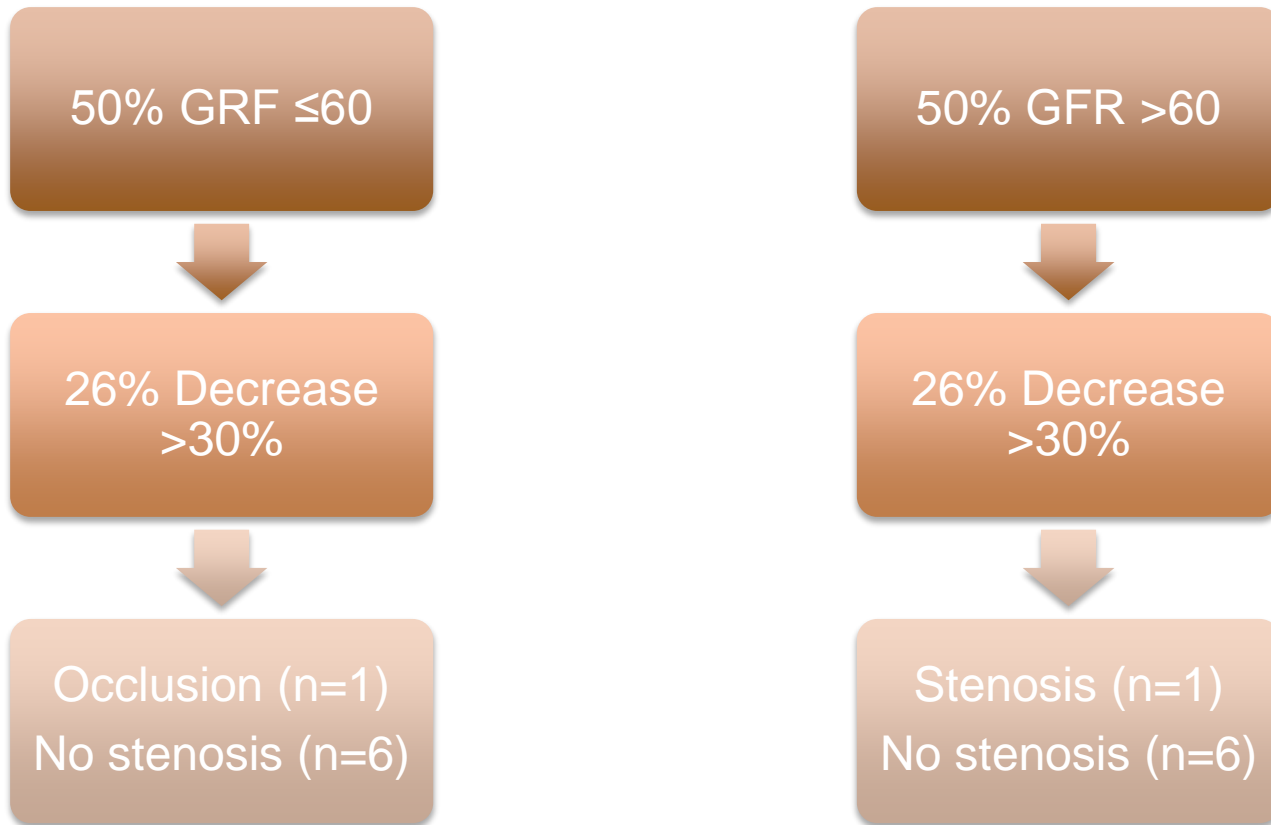
71% at 60 months



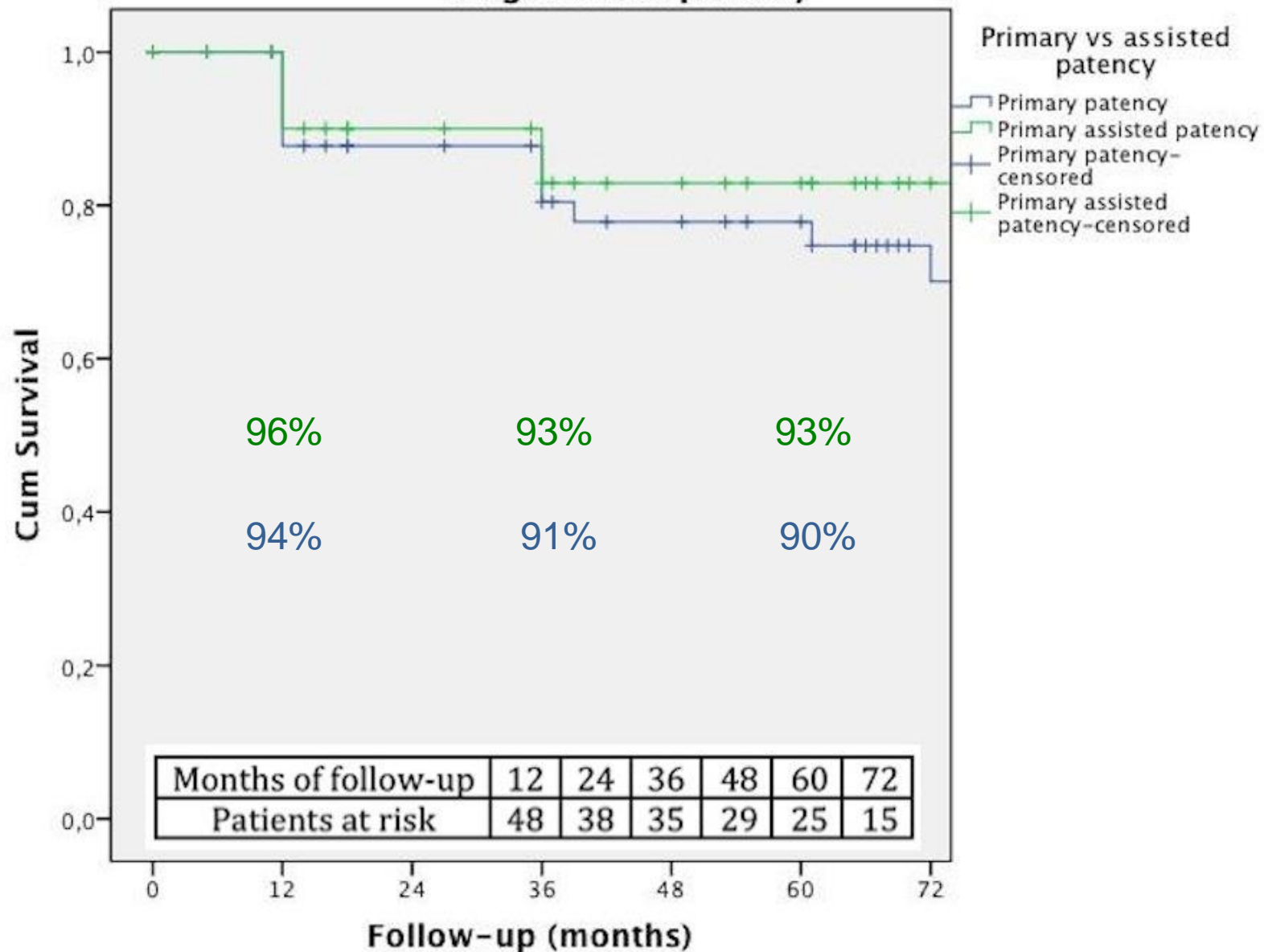
Renal function



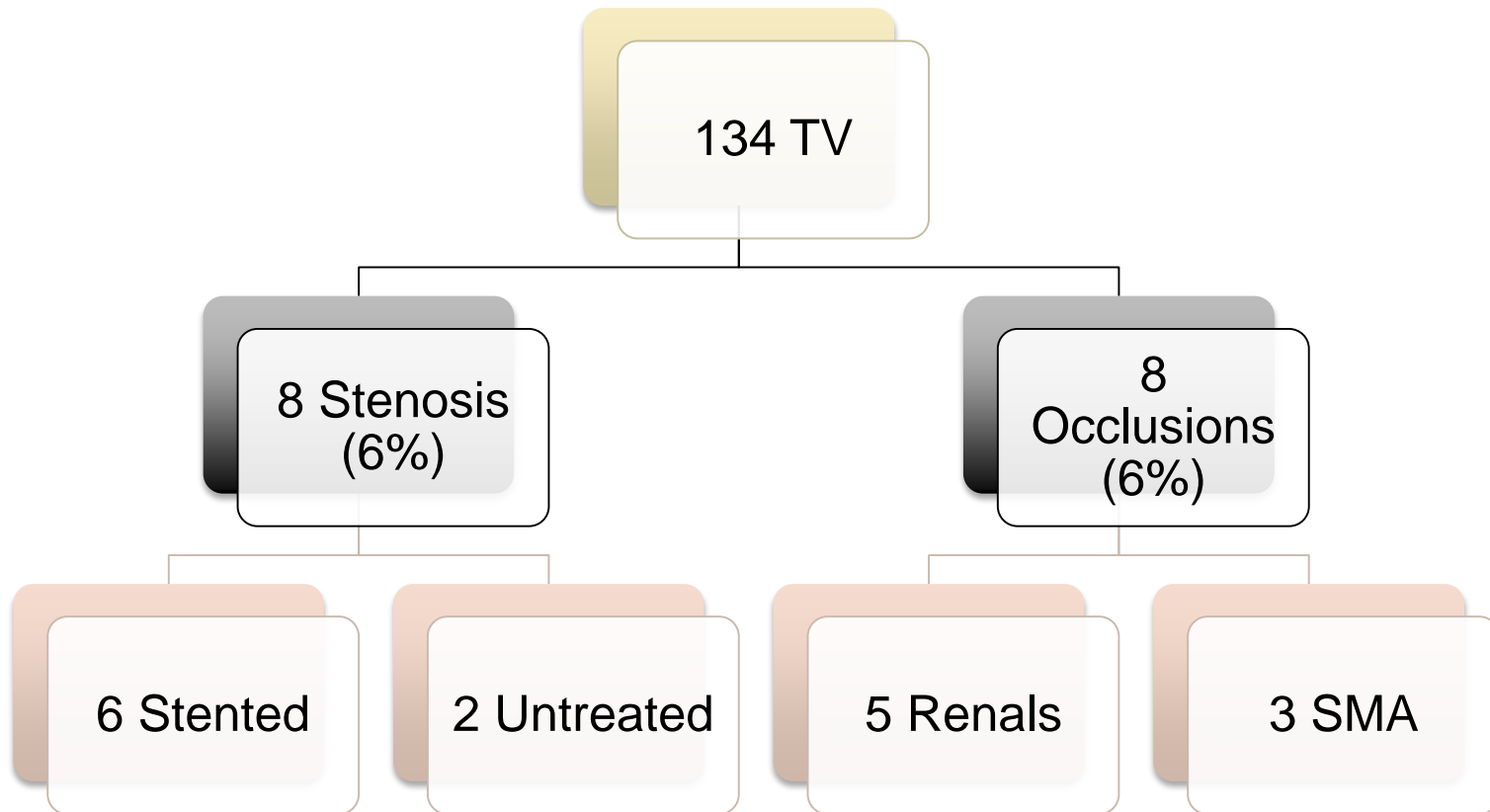
Renal function



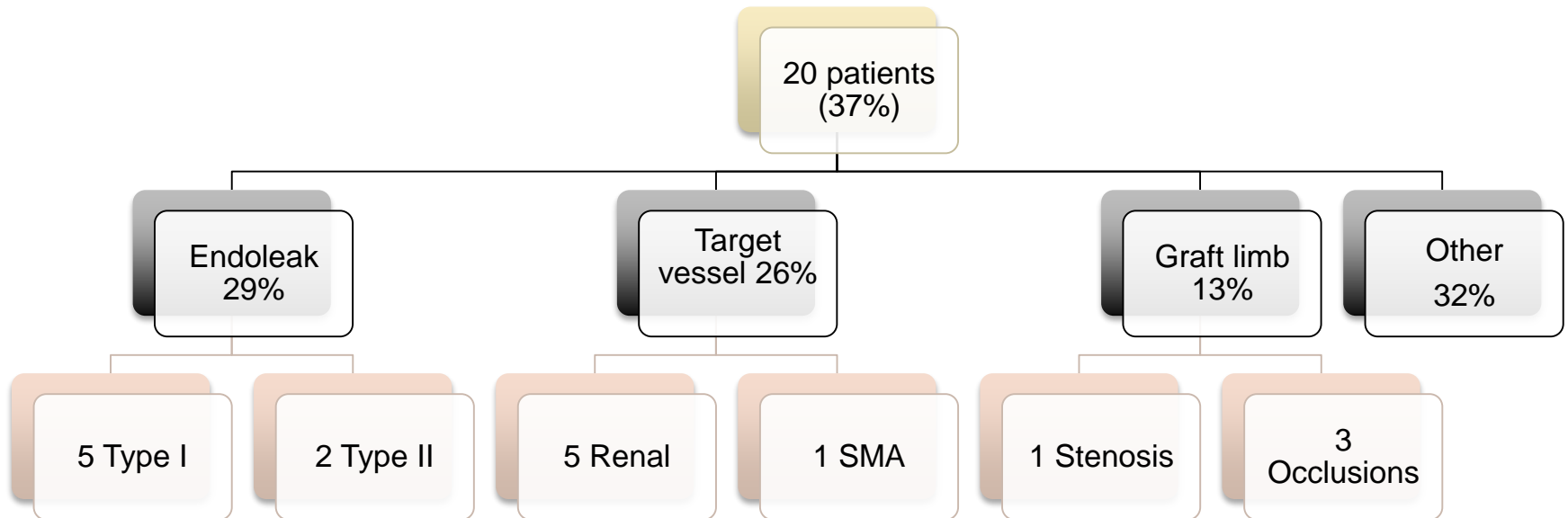
Target vessel patency



TV patency



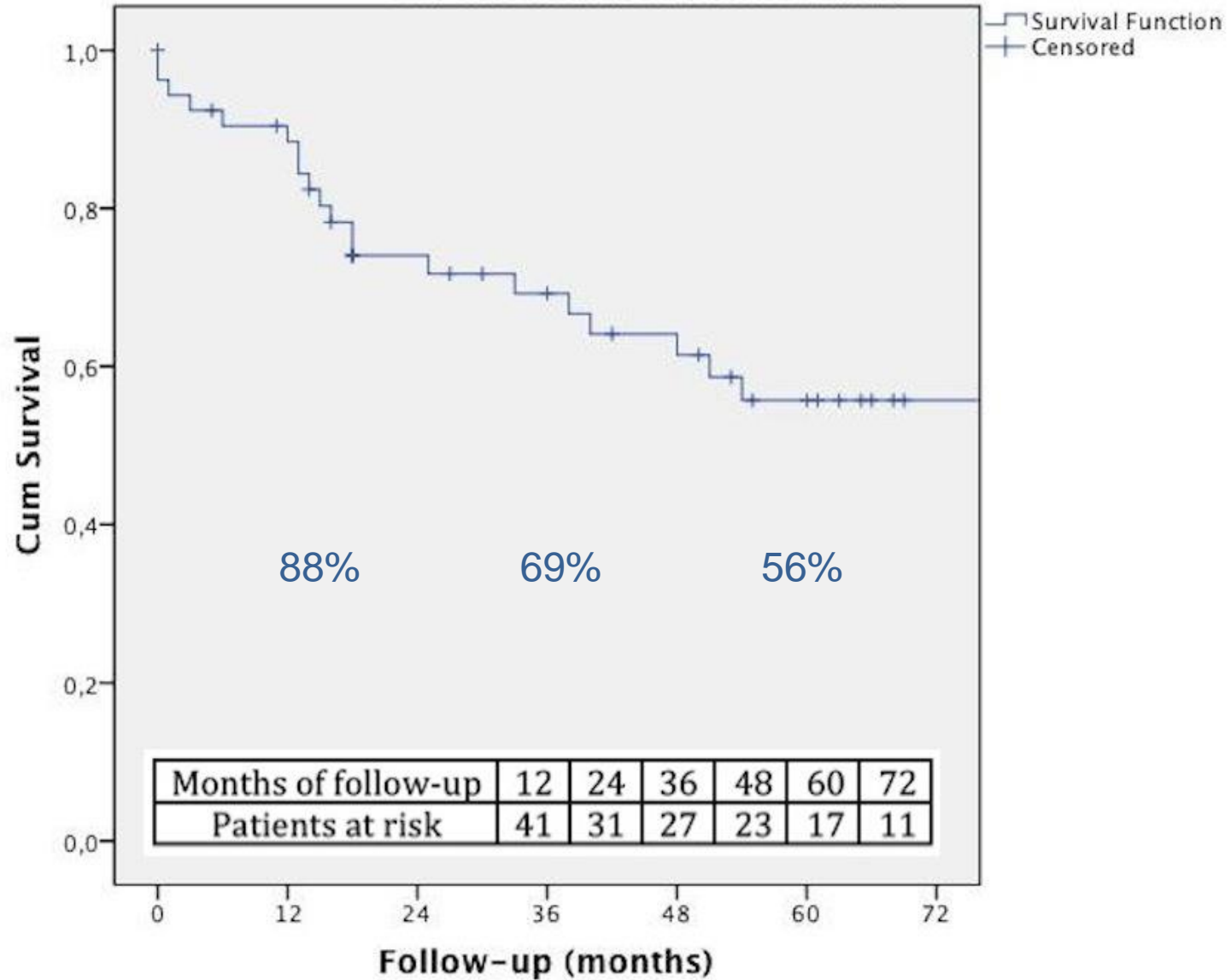
Re-interventions



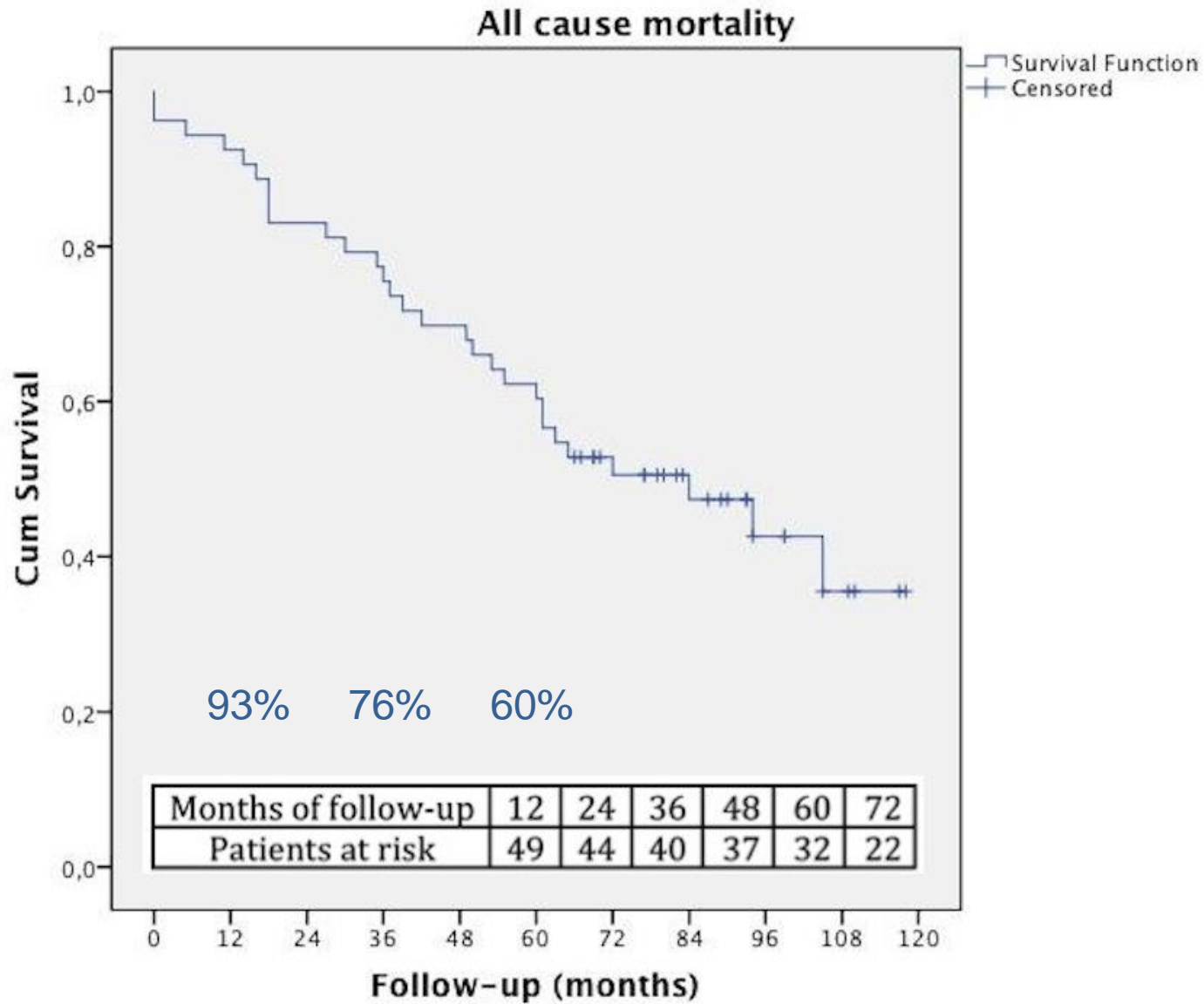
68% of re-interventions based on complications detected on routine follow-up



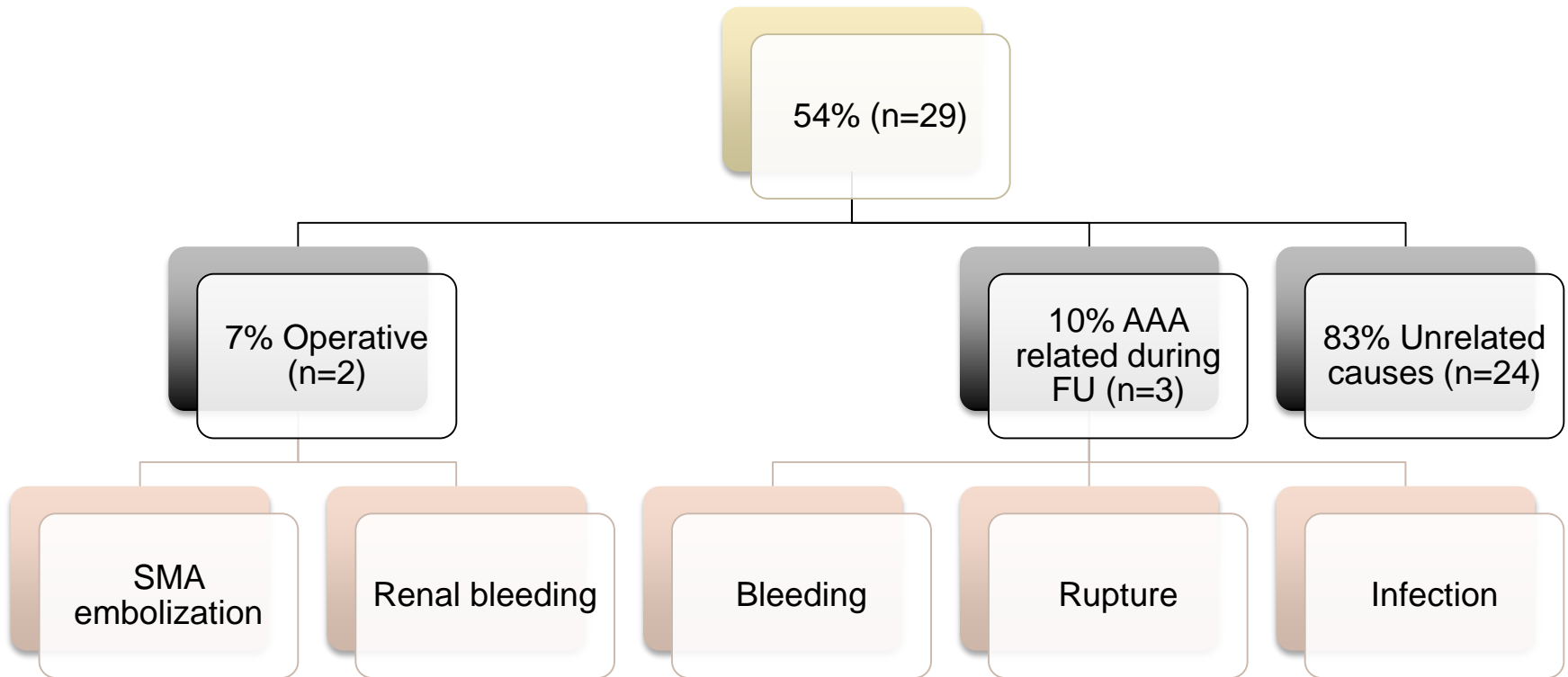
Re-intervention free survival



Survival



Mortality



Conclusion

- Long-term mortality is high but mostly non-aneurysm related
- Aneurysm related mortality is associated with technical complications that can be reduced with increased experience and better understanding of the stent graft behavior
- Re-interventions are common 37%
- most complications are detected on routine CT follow-up 68%
- Knowledge of failure mechanisms is vital to adequately evaluate postoperative imaging



Thank you!

