Is emergency endovascular aneurysm repair associated with higher secondary intervention risk at mid-term follow-up?

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Objective: **The study assessed mid-term outcome of emergency endovascular repair for acute infrarenal abdominal aortic aneurysms, with special attention to secondary interventions.**

Methods: **Between May 1998 and August 2005, 56 patients underwent emergent endovascular repair for a ruptured abdominal aortic aneurysm (n = 34) or an acute nonruptured abdominal aortic aneurysm (n = 22). During the same period, 322 consecutive patients underwent elective endovascular aneurysm repair and were used as control group. Five types of stent grafts were used: Vanguard, Talent, Excluder, Zenith, and Quantum. Follow-up included abdominal radiograph, duplex ultrasound scanning, and computed tomographic angiography. Outcome measures included all-cause and aneurysm-related mortality, complications, and secondary interventions.**

Results: **Mortality at 30 days was 18%, 5%, and 1% in the ruptured, acute nonruptured, and elective aneurysm groups, respectively. Overall mean follow-up was 38 ± 26 months. In the ruptured aneurysm group, survival was 67.8% ± 8.6% at 1 year and 62.1% ± 9.5% at 2 and 3 years. Seven secondary interventions (4 early and 3 late) were required in five patients (15%), with a cumulative risk of 9.2% ± 5.1% at 1 year and 16.2% ± 8.2% at 2 and 3 years. In the acute nonruptured aneurysm group, survival was 90.9% ± 6.1% at 1 year, 84.8% ± 8.2% at 2 years, and 76.4% ± 10.9% at 3 years. Four secondary interventions (1 early and 3 late) were required in four patients (18%), with a cumulative risk of 9.6% ± 6.5% at 1 and 2 years and 20.9% ± 12.0% at 3 years. In the elective aneurysm (control) group, survival was 95.2% ± 1.2% at 1 year, 89.9% ± 1.8% at 2 years, and 86.2% ± 2.1% at 3 years. A total of 51 secondary interventions (4 early, 47 late) were required in 38 patients (12%), with a cumulative risk of 4.2% ± 1.1% at 1 year, 7.6% ± 1.6% at 2 years, and 12.9% ± 2.2% at 3 years.**

Conclusions: **To our surprise, emergency endovascular aneurysm repair did not present with higher secondary intervention rate at mid-term follow-up. (J Vasc Surg 2006;44:1156-61.)**

More than 10 years ago, the first case report about emergent endovascular aneurysm repair (eEVAR) was published by Yusuf, et al.[1] Since then, the feasibility of this technique has been demonstrated by several cohort studies.[2-9] These reports show 30-day mortality rates, albeit in preselected patients, of 9% to 45%.[10] They do compare well with mortality rates of open repair for acute abdominal aortic aneurysms (AAAs). A meta-analysis of open repair for ruptured AAAs (rAAAs) calculated a mortality rate of 48%.[11] A review of open repair for acute nonruptured AAAs (nrAAAs) reported a mortality rate of 15.8%.[12] However, there are no level I or II data that support the results of the eEVAR cohort studies. One randomized controlled trial comparing eEVAR with open repair for rAAAs is still recruiting patients.[13]

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Competition of interest: none.

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In view of the still poor results of open surgery, some authors do believe that eEVAR will likely become the gold standard for the treatment of suitable patients with rAAAs.[14] Critics argue that patient selection plays an overly important role to be able to compare both techniques. They also mention the risk of complications and secondary interventions after elective EVAR.[15-16] With eEVAR, an even higher secondary intervention rate might be expected. This could be explained in several ways:

1. Acute AAAs represent end-stage disease and are therefore associated with more difficult anatomy. This may result in lower suitability and, because of angulation, in more difficult access and deployment of the graft. This additional technical challenge could lead to less-than-optimal positioning and subsequent results.
2. The emergent character of the whole procedure renders measurement and execution more tedious.
3. The presence of type II endoleaks in rAAAs could lead to prolonged bleeding with development of abdominal compartment syndrome, a factor that negatively affects survival.[17]

A recently published article by Hechelhammer, et al[18] demonstrated an increased cumulative secondary intervention risk in eEVAR compared with a large elective EVAR series from the literature. This study assessed outcome of

Table I. Patient and aneurysm related characteristics and type of anesthesia used

	rAAA	*Acute nrAAA*	*Elective AAA*
Age (year)	73 ± 9	73 ± 9	71 ± 8
Male/female (%)	91/9	91/9	94/6
Aneurysm diameter (mm)	74 ± 19	64 ± 11	59 ± 10
Prox. neck length (mm)	22 ± 6	30 ± 16	28 ± 11
Anesthesia (%)			
Local	80	86	74
General	20	14	14
Spinal	0	0	12
ASA classification [21](%)			
2	0	9	24
3	32	68	72
4	68	23	4
Comorbidity (%)			
Coronary artery disease	44.1	45.5	46.6
Congestive heart failure	11.8	13.6	7.8
Arrhythmia	17.6	13.6	13.4
COPD	26.5	18.2	25.5
Diabetes mellitus	11.8	9.1	9.3
Hypertension	29.4	40.9	51.9
Chronic renal failure*	11.8	4.5	6.2

rAAA, Ruptured abdominal aortic aneurysm; *nrAAA,* nonruptured abdominal aortic aneurysm; *ASA,* American Society of Anesthesiology; *COPD,* chronic obstructive pulmonary disease.
*Serum creatinine, >150 umol/L.

eEVAR for both rAAAs and acute nrAAAs in a tertiary referral center. It was anticipated that eEVAR would be associated with higher incidence of complications and, hence, of both early and late secondary interventions, compared with elective EVAR.

PATIENTS AND METHODS

Patients. Between May 1998 and August 2005, 56 patients underwent eEVAR for an acute infrarenal AAA, of whom 34 had a rAAA (61%) and 22 an acute nrAAA (39%). From the beginning of the study period on, patients presenting with an acute AAA were evaluated for eEVAR. Prerequisites for evaluation were the availability of an endovascular team and a sufficient stock of devices. From 2003 on, eEVAR was performed on an intention-to-treat basis. Indeed, with increasing experience, an on-call team could be provided at all times, and from then on devices were always available.

Interpretation of hemodynamic stability in rAAA to allow evaluation for eEVAR was left to the discretion of the attending surgeon. Systolic blood pressures as low as 50 to 70 mm Hg were accepted in applying the "hypotensive hemostasis" principle.[19] This means that fluid administration was restricted to avoid rise in blood pressure with the risk of subsequent bleeding.

Anatomic suitability for eEVAR was determined by computed tomographic angiography (CTA) according to guidelines for elective EVAR. These included a proximal neck length >15 mm with <60° angulation and access vessels large enough to accommodate the introducer sheaths.[20] With time patients with more peculiar anatomy were also accepted, including those with severe angulations of neck and iliac arteries. This decision was reached between the attending vascular surgeon and interventional radiologist.

As a frame of reference for outcome, we defined a case-matched cohort of the 322 patients who underwent elective endovascular AAA repairs during the study period. During the same period, 211 patients underwent acute open repair, of whom 161 (76%) had a rAAA and 50 (24%) an acute nrAAA. Only 6% of patients presenting to our hospital with an acute AAA were not treated, mainly because of old age and comorbidity. Patient and aneurysm characteristics and type of anesthesia used are listed in Table I.[21]

Procedure. The first choice for anesthesia was local.[7]A bifurcated device was used whenever possible, which represents the most physiologic solution and is our daily practice in elective EVAR. Several types of stent grafts were inserted. In the beginning the choice was determined by market availability (Table II); now we have a full stock of both Zenith (Cook, Bloomington, Ind) and Excluder (W.L. Gore & Associates, Flagstaff, Ariz) stent grafts, which explains their use in acute cases in our hospital.

Follow-up. Duplex ultrasound scanning (DUS) and plain radiographs of the abdomen in four directions were performed at discharge, 6 months, 1 year, and then yearly. CTA was performed ≤4 weeks after the procedure to confirm exclusion of the aneurysm. Thereafter CTA was only done if routine follow-up DUS or radiographs suggested any problem, including a type I or III endoleak, a type II endoleak with increase of the aneurysmal sac diameter, or in the event of migration, severe kinking, or structural damage of the stent graft. Indications for secondary intervention included type I and III endoleak or migration with imminent type I or III endoleak. Aneurysmal sac growth, with or without type II endoleak (endotension),

Table II. Stent grafts inserted

Type*	rAAA n (%)	Acute nrAAA n (%)	Elective AAA n (%)
Vanguard[a]	0 (0)	4 (18)	27 (8)
Talent[b]	2 (6)	1 (5)	51 (16)
Excluder[c]	3 (9)	0 (0)	61 (19)
Zenith[d]	9 (85)	17 (77)	170 (53)
Quantum[e]	0 (0)	0 (0)	13 (4)

rAAA, Ruptured abdominal aortic aneurysm; *nrAAA,* nonruptured abdominal aortic aneurysm.
*The stent grafts inserted are listed in chronological order.
[a]Boston Scientific Corp., Waterston, Mass.
[b]World Medical/Medtronic Corp., Sunrise, Fla.
[c]W.L. Gore & Associates, Flagstaff, Ariz.
[d]Cook, Bloomington, Ind.
[e]Cordis, Miami Lakes, Fla.

was an indication for secondary intervention, but the indication was balanced with the patient's age and comorbidity. Limb occlusion with disabling claudication or critical ischemia or severe kinking with imminent limb occlusion was also an indication for secondary intervention.

Definitions. An acute AAA was defined as any AAA requiring treatment ≤24 hours. A differentiation was made between the rAAA and the acute nrAAA. The rAAA classification was only awarded in the presence of a retroperitoneal hematoma on CTA. All other acute AAAs were classified as acute nrAAAs as determined by acute onset of abdominal or back pain combined with pain at aneurysm palpation.

Aneurysm-related deaths were defined as all deaths due to aneurysm rupture after a primary or secondary intervention or open conversion.[22] Early deaths (<30 days after the primary intervention or within the same hospital admission) were all classified as aneurysm related. Late deaths were only classified as unrelated if a nonrelated cause of death could be attributed.

In the context of this study, complications other than death of the patient refer only to those related to the aneurysm or stent graft.

A secondary intervention was defined as any subsequent endovascular or open surgical treatment related to aneurysm repair or complications thereof. An open conversion was defined as a laparotomy with removal of the stent graft and insertion of a surgical prosthesis. The term laparotomy implied nonconversion laparotomy only.

Statistics. Data were prospectively collected in an Access database (Microsoft Corp, Redmond Wash) and analyzed using SPSS 12.0.1 (SPSS, Chicago, Ill) and GraphPad Prism 4 (GraphPad Software, San Diego, Calif). The outcome measures were all-cause and aneurysm-related mortality, complications, and secondary interventions. Variables were expressed as mean ± standard deviation. Time-to-event variables were studied with Kaplan-Meier survival analysis. If the standard error >10%, data were not presented in the figures. Comparison of time-to-event curves was conducted with Peto log-rank test. Values of $P < .05$ were considered statistically significant.

RESULTS

Early complications. In the rAAA group, six (18%) of 34 patients died during the in-hospital period or ≤30 days. One patient died during the procedure. This 85-year-old patient presented with an AAA extending to both iliac bifurcations, but he died before complete exclusion. Five patients died in the postoperative period. One patient died the same day on the intensive care unit, probably due to a hypovolemic shock, although the completion angiogram showed exclusion of the AAA. Another patient died on day 4 due to cardiac failure. One patient, who underwent open conversion because of insufficient access, died of multiple organ failure on day 12. Another patient underwent a secondary intervention (laparotomy) on the day of the initial procedure for evacuation of a large retroperitoneal hematoma and died of respiratory insufficiency on day 14. The last patient who died had a complicated postoperative outcome with three reinterventions (laparotomies) for compartment syndrome, ischemic colitis, and sepsis. A severe pneumonia developed, and he died on day 20.

Three (other) intraoperative complications occurred. In one patient, a renal artery was inadvertently covered, which was accepted. In another, a contralateral limb was malpositioned. This patient also had a large retroperitoneal hematoma; therefore a laparotomy was performed to reposition the limb manually and to evacuate the hematoma. In the third, a local arterial access problem was solved with a patch plasty.

One (5%) of 22 patients in the acute nrAAA group died on day 6 because of respiratory insufficiency. Another patient underwent a secondary intervention because of a progressive groin hematoma after he had been treated with an aortouniiliac system with a femorofemoral crossover bypass.

In the elective AAA (control) group, the in-hospital or 30 day mortality was 3 (1%) of 322. One patient died due to bleeding from an intracerebral metastasis and two others due to myocardial infarction with ventricle fibrillation. Complications requiring secondary intervention are listed in Table III.

Late complications. Mean follow-up in the rAAA group was 20 ± 21 months. During that period, five patients died after a mean of 11 months (range, 4 to 24 months). Two late deaths were due to cardiac events. One patient died as a result of acute leukemia and another related to an excess amount of different medications combined with severe anemia, for which treatment failed. The last late death occurred in an 86-year-old man with hypovolemic shock, most probably due to rupture of a concomitant 67-mm-diameter thoracic aortic aneurysm. Cumulative survival was 67.8% ± 8.6% at 1 year and 62.1% ± 9.5% at 2 and 3 years (Fig 1, *A*).

Three late complications required secondary intervention. (Table III). One patient developed a proximal type I endoleak after 4 years due to caudal migration of the graft (Talent) that was probably caused by extension of disease. This resulted in an overly short neck for standard EVAR,

Table III. Early and late secondary interventions

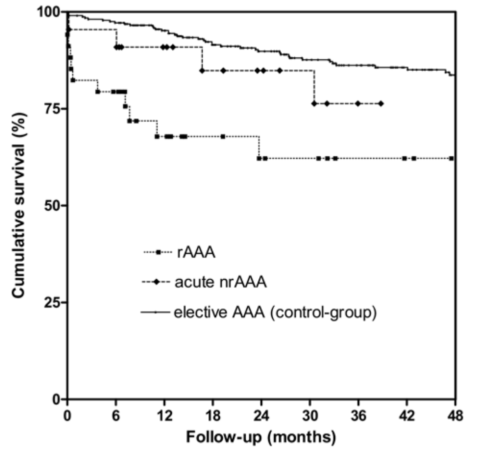
Secondary interventions	*N*	*Patients*	*%*
In ruptured AAA			
Early secondary interventions	4	2	6
Laparotomy (4)			
Late secondary interventions	3	3	9
Fenestrated aortic cuff (1)			
Laparotomy + ligation of side branches (1)			
Coil-embolization (1)			
Patients without secondary interventions		29	85
Total	7	34	100
In acute nonruptured AAA			
Early secondary interventions	1	1	4
Groin exploration (1)			
Late secondary interventions	3	3	14
Wallstents + extensions (2)			
Extension, custom made (1)			
Patients without secondary interventions		18	82
Total	4	22	100
In elective AAA			
Early secondary interventions	4	4	1
Thrombolysis + Wallstent iliac limb (1)			
Aortic cuff (1)			
Bypass from SMA to renal artery (1)			
Embolectomy + Wallstent iliac limb (1)			
Late secondary interventions	47	34	11
Embolectomy + Wallstent iliac limb (2)			
Embolectomy + extensions (1)			
Thrombolysis + Wallstent iliac limb (1)			
Iliofemoral cross-over bypass (5)			
PTA iliac limb (1)			
PTA + Wallstent iliac limb (2)			
Wallstent (1)			
Coil-embolization (7)			
Aortic cuff (4)			
Fenestrated aortic cuff (2)			
Wallstents + extensions (3)			
Extension, custom made (6)			
Laparotomy + ligation of side branches (3)			
Laparotomy + suture aneurysm sac (1)			
Bridging stent graft (1)			
Conversion to open repair (7)			
Patients without secondary interventions		284	88
Total	51	322	100

and he was therefore treated with a fenestrated cuff (Cook). Finally, two patients with secondary type II endoleaks resulting in aneurysm growth were treated. In the first, this was done by coil-embolization after 19 months, and in the second, by laparotomy with ligation of the inferior mesenteric artery and lumbar arteries after 3 months. Cumulative secondary intervention risk (early included) was 9.2% ± 5.1% at 1 year and 16.2% ± 8.2% at 2 and 3 years (Fig 2).

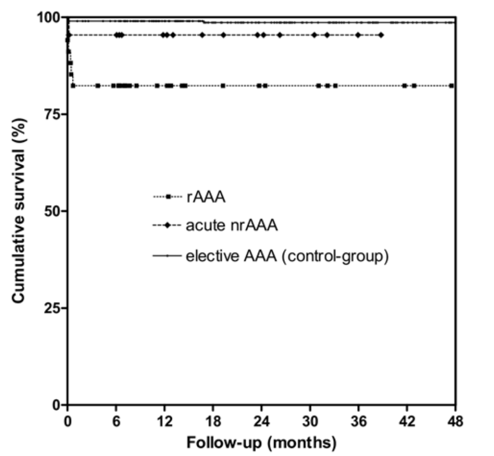
In addition to the complications requiring treatment, three secondary type II endoleaks (1 with growth and 2 without growth) occurred. In all cases a watchful waiting policy was adopted with a 6-month follow-up interval. Finally, in one Excluder case, the aneurysm did grow without appearance of an endoleak on DUS and CTA. This was therefore classified as endotension, and that patient also is on a closer follow-up regimen at 6-month intervals.

Mean follow-up was 32 ± 25 months in the acute nrAAA group. During that period three patients died after a mean of 17 months (range, 6 to 31 months). Two late deaths were due to cardiac events, and the last death was due to cholangiocarcinoma. Cumulative survival was 90.9% ± 6.1% at 1 year, 84.8% ± 8.2% at 2 years, and 76.4% ± 10.9% at 3 years. (Fig. 1A).

Three late complications required secondary intervention (Table III). In these cases, a limb extension was applied to correct kinking and upward migration of the iliac limbs (2 Vanguards) or an overly short initial positioning in the common iliac artery (Talent). In both Vanguard cases, treatment consisted of insertion of Wallstents combined with Passager iliac extensions (Boston Scientific, Watertown, Mass), after 35 and 38 months, respectively. In the Talent case, a custom-made tapered iliac extension (Cook) was inserted after 6 months. Cumulative secondary intervention risk (early included) was 9.6% ± 6.5% at 1 and 2 years and 20.9% ± 12.0% at 3 years (Fig 2). There were two secondary type II endoleaks (1 each with and without



Numbers at risk:									
rAAA	34	27	18	14	12	11	8	7	5
acute nrAAA	22	21	18	15	12	11	8	7	7
elective AAA	322	312	275	239	213	191	170	140	119

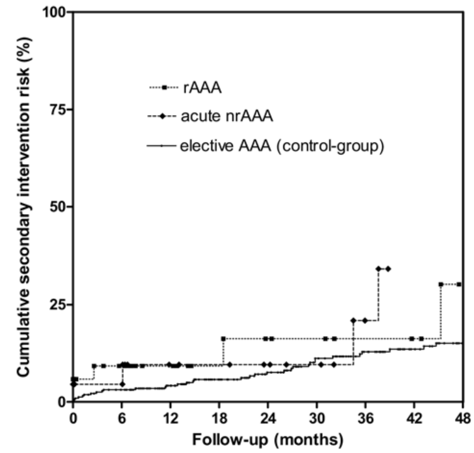


Numbers at risk:									
rAAA	34	27	18	14	12	11	8	7	5
acute nrAAA	22	21	18	15	12	11	8	7	7
elective AAA	322	312	275	239	213	191	170	140	119

Fig 1. A, Kaplan-Meier curves of patient survival expressed as all cause mortality. **B,** Kaplan-Meier curves of patient survival expressed as aneurysm-related mortality. *rAAA,* Ruptured abdominal aortic aneurysm; *nrAAA,* nonruptured abdominal aortic aneurysm.

growth), for which a watchful waiting policy was adopted, as described earlier.

In the elective AAA (control) group, mean follow-up was 40 ± 25 months. During that period, 53 patients died after a mean of 32 months (range, 2 to 84 months). Two deaths were classified as aneurysm-related (Fig 1, *B*) because the cause of death was unknown, whilst there was an endotension in one patient and a type II endoleak in the other. Cumulative survival was 95.2% ± 1.2% at 1 year, 89.9% ± 1.8% at 2 years, and 86.2% ± 2.1% at 3 years (Fig 1, *A*). Complications requiring secondary intervention are listed in Table III. Cumulative secondary intervention risk (early included) was 4.2% ± 1.1% at 1 year, 7.6% ± 1.6% at 2 years, and 12.9% ± 2.2% at 3 years (Fig 2).



Numbers at risk:									
rAAA	34	26	18	14	12	11	9	8	5
acute nrAAA	22	20	16	15	12	11	7	5	5
elective AAA	322	302	262	223	196	169	145	118	100

Fig 2. Kaplan-Meier curves of secondary intervention risk. *rAAA,* Ruptured abdominal aortic aneurysm; *nrAAA,* nonruptured abdominal aortic aneurysm.

The 30-day mortality for patients who underwent open repair for an acute infrarenal AAA was 32% in the rAAA group and 8% in the acute nrAAA group.

DISCUSSION

In this study comparing mid-term results of emergency EVAR in 56 patients (34 rAAA and 22 acute nrAAA) with elective EVAR in 322 patients, survival curves differed significantly for the rAAA and elective AAA patients. However, all cause mortality was similar between the three cohorts when the 30-day deaths were excluded. In addition, no late aneurysm related deaths occurred in the rAAA or the acute nrAAA groups.

Compared with elective EVAR, eEVAR in proven ruptures carries additional risks for early complications: in two patients early secondary interventions were needed due to a progressing retroperitoneal hematoma and complications thereof.

Only one other study, by Hechelhammer, et al,[18] addressed mid-term outcome of eEVAR. In that report of 37 patients with an acute rAAA, overall survival was 89% at 1 year, 84% at 2 years, and 70% at 4 years. In contrast to their lower mortality compared with the result in this study, there was a higher secondary aneurysm-related procedure risk of 35% at 2 years and 44% at 3 years. These figures were explained by a high rate of early postoperative interventions. In their view, this could be a consequence of suboptimal fluoroscopy in the emergency operating room, or retroperitoneal hematoma. But also lack of the best-fitting stent graft available off the shelf and the fact that many of the interventions were performed outside office hours could have played a role.

They conclude that eEVAR is able to convert an acute life-threatening situation to a controlled situation that results in good survival at mid-term follow-up, and they accept subsequent procedures to prevent rupture. Some have even suggested that eEVAR for rAAA is a "bridge procedure" that will ultimately allow safer, elective open AAA repair and that it does not have to be a durable procedure. Our results indicate, however, that eEVAR may be a more durable procedure than expected. This is illustrated by the absence of a significant difference of cumulative secondary intervention risk for both the rAAA and the acute nrAAA groups compared with the control group. Furthermore, no late conversions occurred in either the rAAA or acute nrAAA groups.

Limitations are inherent to this type of study. First, prospectively gathered data did not include information regarding neck and iliac angulation for all patients, so the adverse anatomic conditions per study group could not be presented completely. Second, selection bias might have artificially improved results to a certain extent. Before 2003, without the availability of an endovascular team and a sufficient stock of devices at all times, patients were not always evaluated. This resulted in so-called black-out dates and a low inclusion. From 2003 on, with an endovascular intension-to-treat policy, 32% of all patients were treated by endovascular means, mostly determined by anatomic criteria only. Third, the stent grafts that were used for each group differed to a certain extent. Another issue is that only aneurysm-related or device-related complications were analyzed. Furthermore, the indications for secondary intervention in cases of aneurysmal sac growth due to type II endoleak or endotension varied depending age and comorbidity.

In conclusion, eEVAR appears to be not only lifesaving but also durable in the mid-term and should therefore be considered in all suitable patients with acute aneurysms.

AUTHOR CONTRIBUTIONS

Conception and design: BO, EV
Analysis and interpretation: BO, EV, IT, CZ, TP, WB, JD
Data collection: BO, EV, WB
Writing the article: BO, EV
Critical revision of the article: BO, EV, IT, CZ, TP, WB, JD
Final approval of the article: BO, EV, IT, CZ, TP, WB, JD
Statistical analysis: BO, IT, WB
Obtained funding: Not applicable
Overall responsibility: BO

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Appendix I (online only). Kaplan-Meier data—overall survival

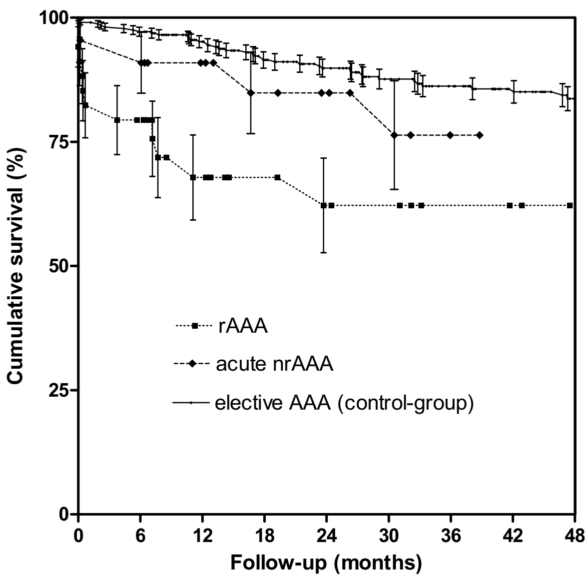

Fig 1. Data presented with standard error bars. *rAAA*, Ruptured abdominal aortic aneurysm; *nrAAA*, nonruptured AAA.

Numbers at risk

	Data set-A	Data set-B	Data set-C
0	34	22	322
0.01	34		322
0.1			320
0.13	32		
0.2		22	319
0.39	31		
0.46	30		
0.69	29		
1.2			318
1.9			317
2.2			316
2.6			315
3.75	28		
4.4			314

Numbers at risk

	Data set-A	Data set-B	Data set-C
5.3			313
5.69	27		
5.9			312
6.08		21	
6.31	26		
6.35	25		
6.38	24		
6.4			309
6.41		20	
6.6			307
6.71		19	
6.74	23		
7			306
7.1			305
7.13	22		
7.17	21		
7.2			304
7.4			303
7.69	20		
7.8			301
8.1			300
8.3			299
8.5			296
8.52	19		
8.7			295
9.1			293
9.3			291
9.5			290
10.1			288
10.4			287
10.6			284
10.7			282
10.9			281
11			280
11.08	18		
11.2			279
11.4			277
11.7			276
11.84		18	
12			275
12.1			274
12.3		17	
12.33	17		
12.5			272
12.6			270
12.79	16		
13.05		16	
13.3			268
13.4			267
13.5			266
13.6			265
13.7			264
13.9			262
14.1			259

Numbers at risk

	Data set-A	Data set-B	Data set-C
14.17	15		
14.3			257
14.56	14		
14.8			255
15			254
15.1			252
15.5			251
16.2			248
16.4			247
16.67		15	
16.7			246
16.9			245
17.1			244
17.4			243
17.9			241
18.1			239
18.3			238
19			235
19.1			234
19.23	13		
19.3		14	
19.8			233
20.2			230
20.8			227
21.1			225
21.4			223
21.6			222
21.8			219
22.3			218
22.8			217
23.3			216
23.51		13	
23.6			215
23.7	12		213
24.26		12	
24.4			212
24.46	11		
25.2			211
25.6			210
25.9			209
26.2			208
26.27		11	
26.3			207
26.4			206
26.8			205
26.9			204
27.1			203
27.4			201
27.5			200
27.6			199
27.8			198
28.1			197
29			195
29.1			193

Numbers at risk

	Data set-A	Data set-B	Data set-C
29.6			192
30.2			191
30.54		10	
31			189
31.07	10		
32.12		9	
32.15	9		
32.3			188
32.4			187
32.5			185
32.8			184
33			183
33.14	8		
33.2			182
33.3			180
33.6			179
33.9			177
34.2			176
34.8			175
35.8			173
35.93		8	
36.3			170
36.4			169
37.2			168
37.4			167
37.7			164
37.8			161
37.9			160
38.1			159
38.2			157
38.4			155
38.79		7	
40			152
40.1			150
40.2			148
40.3			147
40.6			146
40.8			144
41.4			142
41.6			141
41.69	7		
42.1			140
42.7			138
42.87	6		
43.2			137
43.9			136
44.2			134
44.7			133
44.9			132
45.1			131
45.7			129
46.8			127
47.2			125
47.3			123

Numbers at risk

	Data set-A	Data set-B	Data set-C
47.5			122
47.51	5		
47.9			121
48.4			119
48.6			117
48.8			116
49			114
49.5			113
50.1			111
50.2			109
50.5			108
50.7			107
50.93		6	
51.4			106
52.3			104
52.5			102
52.9			100
53.2			99
53.82	4		
54			98
55	3		
55.1			97
55.6			96
55.9			95
56.5			93
57			92
57.7			91
58			90
58.2			89
58.5			88
58.6			87
58.9			86
59.2			85
59.21		5	
59.3			84
60.2			83
60.46	2		
60.6			82
60.7			81
61			79
61.6			78
61.8			77
62.1			75
62.2			73
63.2			72
63.6			71
64.7			67
64.9			66
65.59		4	
65.62		3	
66.8			65
66.9			64
67.6			63
68.4			62

Numbers at risk

	Data set-A	Data set-B	Data set-C
68.6			61
68.7			60
69.2			59
69.9			58
70.1			57
70.3			54
70.6			53
71			52
71.4			50
71.7			48
72			47
73.7			46
73.8			44
74.7			43
74.8			42
75.2			40
75.3			39
75.4			38
76			37
76.2			35
76.4			33
76.7			32
76.8			31
77.1			30
77.7			29
79.36	1		
79.7			28
82.1			27
82.2			23
82.4			22
83.3			20
83.5			19
84		2	
84.5			18
84.89		1	
85			17
85.4			16
85.5			15
85.6			14
86.1			13
86.8			11
87.5			10
87.7			9
88.9			8
89.3			6
89.7			5
90.2			4
90.7			3
93.9			2
94.2			1

Survival proportions

	Data set-A	Data set-A	Data set-B	Data set-B	Data set-C	Data set-C
0	100		100		100	
0.01	94.11765	4.035261			99.68944	0.310076
0.1					99.37791	0.438514
0.13	91.17647	4.864331				
0.2			95.45454	4.440948	99.06638	0.536505
0.39	88.23529	5.525508				
0.46	85.29412	6.073872				
0.69	82.35294	6.53787				
1.2					99.06638	
1.9					98.75387	0.619177
2.2					98.44136	0.691601
2.6					98.12885	0.756726
3.75	79.41177	6.934458				
4.4					97.81633	0.8163
5.3					97.50382	0.871462
5.69	79.41177					
5.9					97.19131	0.923004
6.08			90.90909	6.12909		
6.31	79.41177					
6.35	79.41177					
6.38	79.41177					
6.4					97.19131	
6.41			90.90909			
6.6					97.19131	
6.71			90.90909			
6.74	79.41177					
7					97.19131	
7.1					96.87265	0.973432
7.13	79.41177					
7.17	75.63025	7.565379				
7.2					96.87265	
7.4					96.87265	
7.69	71.84874	8.07709				
7.8					96.55081	1.022017
8.1					96.55081	
8.3					96.55081	
8.5					96.55081	
8.52	71.84874					
8.7					96.55081	
9.1					96.55081	
9.3					96.55081	
9.5					96.55081	
10.1					96.55081	
10.4					96.55081	
10.6					96.21085	1.073475
10.7					95.86967	1.122576
10.9					95.5285	1.169276
11					95.5285	
11.08	67.85714	8.558015				

	Data set-A	Data set-A	Data set-B	Data set-B	Data set-C	Data set-C
11.2					95.5285	
11.4					95.5285	
11.7					95.18238	1.215188
11.84			90.90909			
12					95.18238	
12.1					95.18238	
12.3			90.90909			
12.33	67.85714					
12.5					94.48251	1.303132
12.6					94.48251	
12.79	67.85714					
13.05			90.90909			
13.3					94.12997	1.345114
13.4					94.12997	
13.5					94.12997	
13.6					93.77476	1.386145
13.7					93.77476	
13.9					93.77476	
14.1					93.77476	
14.17	67.85714					
14.3					93.40987	1.427969
14.56	67.85714					
14.8					93.40987	
15					93.40987	
15.1					93.40987	
15.5					93.40987	
16.2					93.03322	1.471047
16.4					93.03322	
16.67			84.84849	8.185728		
16.7					93.03322	
16.9					92.6535	1.513259
17.1					92.27377	1.55397
17.4					92.27377	
17.9					91.50801	1.632688
18.1					91.50801	
18.3					91.50801	
19					91.11861	1.671531
19.1					91.11861	
19.23	67.85714					
19.3			84.84849			
19.8					91.11861	
20.2					91.11861	
20.8					91.11861	
21.1					91.11861	
21.4					90.71001	1.713249
21.6					90.71001	
21.8					90.71001	
22.3					90.71001	
22.8					90.71001	
23.3					90.29005	1.756033
23.51			84.84849			
23.6					89.8701	1.797379
23.7	62.20238	9.531697			89.8701	
24.26			84.84849			

	Data set-A	Data set-A	Data set-B	Data set-B	Data set-C	Data set-C
24.4					89.8701	
24.46	62.20238					
25.2					89.8701	
25.6					89.8701	
25.9					89.8701	
26.2					89.8701	
26.27			84.84849			
26.3					89.43594	1.840385
26.4					89.00179	1.881964
26.8					89.00179	
26.9					89.00179	
27.1					89.00179	
27.4					88.559	1.923987
27.5					88.1162	1.96466
27.6					88.1162	
27.8					88.1162	
28.1					88.1162	
29					88.1162	
29.1					87.65964	2.006828
29.6					87.65964	
30.2					87.65964	
30.54			76.36364	10.91185		
31					87.65964	
31.07	62.20238					
32.12			76.36364			
32.15	62.20238					
32.3					87.65964	
32.4					87.65964	
32.5					87.18581	2.051157
32.8					86.71197	2.094025
33					86.71197	
33.14	62.20238					
33.2					86.71197	
33.3					86.23024	2.137084
33.6					86.23024	
33.9					86.23024	
34.2					86.23024	
34.8					86.23024	
35.8					86.23024	
35.93			76.36364			
36.3					86.23024	
36.4					86.23024	
37.2					86.23024	
37.4					86.23024	
37.7					86.23024	
37.8					86.23024	
37.9					86.23024	
38.1					85.6879	2.191377
38.2					85.6879	
38.4					85.6879	
38.79			76.36364			
40					85.6879	
40.1					85.6879	
40.2					85.6879	

	Data set-A	Data set-A	Data set-B	Data set-B	Data set-C	Data set-C
40.3					85.6879	
40.6					85.6879	
40.8					85.6879	
41.4					85.6879	
41.6					85.6879	
41.69	62.20238					
42.1					85.07585	2.259583
42.7					85.07585	
42.87	62.20238					
43.2					85.07585	
43.9					85.07585	
44.2					85.07585	
44.7					85.07585	
44.9					85.07585	
45.1					85.07585	
45.7					85.07585	
46.8					84.40596	2.338983
47.2					84.40596	
47.3					83.71973	2.418538
47.5					83.71973	
47.51	62.20238					
47.9					83.71973	
48.4					83.71973	
48.6					83.71973	
48.8					83.71973	
49					83.71973	
49.5					83.71973	
50.1					82.9655	2.511603
50.2					82.9655	
50.5					82.9655	
50.7					82.19012	2.605069
50.93			76.36364			
51.4					82.19012	
52.3					82.19012	
52.5					82.19012	
52.9					82.19012	
53.2					82.19012	
53.82	62.20238					
54					82.19012	
55	62.20238					
55.1					82.19012	
55.6					82.19012	
55.9					82.19012	
56.5					81.30636	2.722842
57					80.42259	2.833041
57.7					80.42259	
58					79.52901	2.939111
58.2					79.52901	
58.5					79.52901	
58.6					79.52901	
58.9					79.52901	
59.2					79.52901	
59.21			76.36364			
59.3					79.52901	

	Data set-A	Data set-A	Data set-B	Data set-B	Data set-C	Data set-C
60.2					79.52901	
60.46	62.20238					
60.6					79.52901	
60.7					79.52901	
61					78.52232	3.069475
61.6					78.52232	
61.8					78.52232	
62.1					78.52232	
62.2					78.52232	
63.2					78.52232	
63.6					78.52232	
64.7					78.52232	
64.9					77.33258	3.245358
65.59			76.36364			
65.62			76.36364			
66.8					77.33258	
66.9					77.33258	
67.6					77.33258	
68.4					77.33258	
68.6					77.33258	
68.7					76.04371	3.43769
69.2					76.04371	
69.9					74.7326	3.619815
70.1					73.42151	3.786312
70.3					73.42151	
70.6					73.42151	
71					73.42151	
71.4					73.42151	
71.7					73.42151	
72					71.85935	4.015099
73.7					71.85935	
73.8					71.85935	
74.7					71.85935	
74.8					71.85935	
75.2					70.06287	4.297873
75.3					68.26638	4.547658
75.4					68.26638	
76					66.42134	4.784408
76.2					66.42134	
76.4					66.42134	
76.7					66.42134	
76.8					66.42134	
77.1					66.42134	
77.7					66.42134	
79.36	62.20238					
79.7					66.42134	
82.1					66.42134	
82.2					66.42134	
82.4					66.42134	
83.3					66.42134	
83.5					62.92548	5.66765
84			76.36364			
84.5					62.92548	
84.89			76.36364			

	Data set-A	Data set-A	Data set-B	Data set-B	Data set-C	Data set-C
85					62.92548	
85.4					62.92548	
85.5					62.92548	
85.6					62.92548	
86.1					62.92548	
86.8					62.92548	
87.5					62.92548	
87.7					62.92548	
88.9					62.92548	
89.3					62.92548	
89.7					62.92548	
90.2					62.92548	
90.7					62.92548	
93.9					62.92548	
94.2					62.92548	

Comparison of Survival Curves: A with C (rAAA with elective AAA)

Logrank Test
Chi square 16.79
df 1
P value P<0.0001
P value summary ***
Are the survival curves sig different? Yes

Median survival
Data 1:Data Set-A Undefined
Data 1:Data set-C Undefined

Hazard Ratio
Ratio 3.520
95% CI of ratio 3.234 to 27.85

Comparison of Survival Curves: B with C (acute nrAAA with elective AAA)

Logrank Test
Chi square 0.2049
df 1
P value 0.6508
P value summary ns
Are the survival curves sig different? No

Median survival
Data 1:Data Set-B Undefined
Data 1:Data set-C Undefined

Hazard Ratio
Ratio 1.263
95% CI of ratio 0.4208 to 3.996

Comparison of Survival Curves: A with B (rAAA with acute nrAAA)

Logrank Test
Chi square 1.973
df 1
P value 0.1601
P value summary ns
Are the survival curves sig different? No

Median survival
Data 1:Data Set-A Undefined
Data 1:Data Set-B Undefined

Hazard Ratio
Ratio 2.214
95% CI of ratio 0.7483 to 5.794

Appendix II (online only). Kaplan-Meier data—related survival

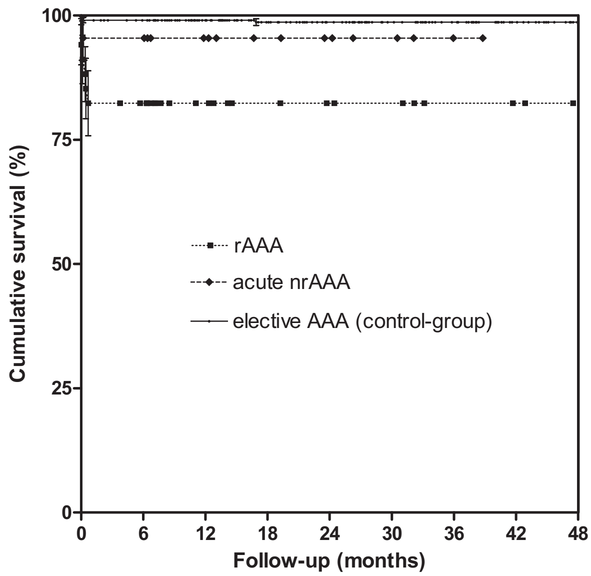

Fig 1. Data presented with standard error bars. *rAAA*, Ruptured abdominal aortic aneurysm; *nrAAA*, nonruptured AAA.

Numbers at risk

	Data set-A	Data set-B	Data set-C
0	34	22	322
0.01	34		322
0.1			320
0.13	32		
0.2		22	319
0.39	31		
0.46	30		
0.69	29		
1.2			318
1.9			317
2.2			316
2.6			315
3.75	28		
4.4			314

Numbers at risk

	Data set-A	Data set-B	Data set-C
5.3			313
5.69	27		
5.9			312
6.08		21	
6.31	26		
6.35	25		
6.38	24		
6.4			309
6.41		20	
6.6			307
6.71		19	
6.74	23		
7			306
7.1			305
7.13	22		
7.17	21		
7.2			304
7.4			303
7.69	20		
7.8			301
8.1			300
8.3			299
8.5			296
8.52	19		
8.7			295
9.1			293
9.3			291
9.5			290
10.1			288
10.4			287
10.6			284
10.7			282
10.9			281
11			280
11.08	18		
11.2			279
11.4			277
11.7			276
11.84		18	
12			275
12.1			274
12.3		17	
12.33	17		
12.5			272
12.6			270
12.79	16		
13.05		16	
13.3			268
13.4			267
13.5			266
13.6			265
13.7			264
13.9			262
14.1			259

Numbers at risk

	Data set-A	Data set-B	Data set-C
14.17	15		
14.3			257
14.56	14		
14.8			255
15			254
15.1			252
15.5			251
16.2			248
16.4			247
16.67		15	
16.7			246
16.9			245
17.1			244
17.4			243
17.9			241
18.1			239
18.3			238
19			235
19.1			234
19.23	13		
19.3		14	
19.8			233
20.2			230
20.8			227
21.1			225
21.4			223
21.6			222
21.8			219
22.3			218
22.8			217
23.3			216
23.51		13	
23.6			215
23.7	12		213
24.26		12	
24.4			212
24.46	11		
25.2			211
25.6			210
25.9			209
26.2			208
26.27		11	
26.3			207
26.4			206
26.8			205
26.9			204
27.1			203
27.4			201
27.5			200
27.6			199
27.8			198
28.1			197
29			195
29.1			193

Numbers at risk

	Data set-A	Data set-B	Data set-C
29.6			192
30.2			191
30.54		10	
31			189
31.07	10		
32.12		9	
32.15	9		
32.3			188
32.4			187
32.5			185
32.8			184
33			183
33.14	8		
33.2			182
33.3			180
33.6			179
33.9			177
34.2			176
34.8			175
35.8			173
35.93		8	
36.3			170
36.4			169
37.2			168
37.4			167
37.7			164
37.8			161
37.9			160
38.1			159
38.2			157
38.4			155
38.79		7	
40			152
40.1			150
40.2			148
40.3			147
40.6			146
40.8			144
41.4			142
41.6			141
41.69	7		
42.1			140
42.7			138
42.87	6		
43.2			137
43.9			136
44.2			134
44.7			133
44.9			132
45.1			131
45.7			129
46.8			127
47.2			125
47.3			123

Numbers at risk

	Data set-A	Data set-B	Data set-C
47.5			122
47.51	5		
47.9			121
48.4			119
48.6			117
48.8			116
49			114
49.5			113
50.1			111
50.2			109
50.5			108
50.7			107
50.93		6	
51.4			106
52.3			104
52.5			102
52.9			100
53.2			99
53.82	4		
54			98
55	3		
55.1			97
55.6			96
55.9			95
56.5			93
57			92
57.7			91
58			90
58.2			89
58.5			88
58.6			87
58.9			86
59.2			85
59.21		5	
59.3			84
60.2			83
60.46	2		
60.6			82
60.7			81
61			79
61.6			78
61.8			77
62.1			75
62.2			73
63.2			72
63.6			71
64.7			67
64.9			66
65.59		4	
65.62		3	
66.8			65
66.9			64
67.6			63
68.4			62

Numbers at risk

	Data set-A	Data set-B	Data set-C
68.6			61
68.7			60
69.2			59
69.9			58
70.1			57
70.3			54
70.6			53
71			52
71.4			50
71.7			48
72			47
73.7			46
73.8			44
74.7			43
74.8			42
75.2			40
75.3			39
75.4			38
76			37
76.2			35
76.4			33
76.7			32
76.8			31
77.1			30
77.7			29
79.36	1		
79.7			28
82.1			27
82.2			23
82.4			22
83.3			20
83.5			19
84		2	
84.5			18
84.89		1	
85			17
85.4			16
85.5			15
85.6			14
86.1			13
86.8			11
87.5			10
87.7			9
88.9			8
89.3			6
89.7			5
90.2			4
90.7			3
93.9			2
94.2			1

Survival proportions

	Data set-A	Data set-A	Data set-B	Data set-B	Data set-C	Data set-C
0	100		100		100	
0.01	94.11765	4.035261			99.68944	0.310076
0.1					99.37791	0.438514
0.13	91.17647	4.864331				
0.2			95.45454	4.440948	99.06638	0.536505
0.39	88.23529	5.525508				
0.46	85.29412	6.073872				
0.69	82.35294	6.53787				
1.2					99.06638	
1.9					99.06638	
2.2					99.06638	
2.6					99.06638	
3.75	82.35294					
4.4					99.06638	
5.3					99.06638	
5.69	82.35294					
5.9					99.06638	
6.08			95.45454			
6.31	82.35294					
6.35	82.35294					
6.38	82.35294					
6.4					99.06638	
6.41			95.45454			
6.6					99.06638	
6.71			95.45454			
6.74	82.35294					
7					99.06638	
7.1					99.06638	
7.13	82.35294					
7.17	82.35294					
7.2					99.06638	
7.4					99.06638	
7.69	82.35294					
7.8					99.06638	
8.1					99.06638	
8.3					99.06638	
8.5					99.06638	
8.52	82.35294					
8.7					99.06638	
9.1					99.06638	
9.3					99.06638	
9.5					99.06638	
10.1					99.06638	
10.4					99.06638	
10.6					99.06638	
10.7					99.06638	
10.9					99.06638	
11					99.06638	
11.08	82.35294					

	Data set-A	Data set-A	Data set-B	Data set-B	Data set-C	Data set-C
11.2					99.06638	
11.4					99.06638	
11.7					99.06638	
11.84			95.45454			
12					99.06638	
12.1					99.06638	
12.3			95.45454			
12.33	82.35294					
12.5					99.06638	
12.6					99.06638	
12.79	82.35294					
13.05			95.45454			
13.3					99.06638	
13.4					99.06638	
13.5					99.06638	
13.6					99.06638	
13.7					99.06638	
13.9					99.06638	
14.1					99.06638	
14.17	82.35294					
14.3					99.06638	
14.56	82.35294					
14.8					99.06638	
15					99.06638	
15.1					99.06638	
15.5					99.06638	
16.2					99.06638	
16.4					99.06638	
16.67			95.45454			
16.7					99.06638	
16.9					98.66203	0.669572
17.1					98.66203	
17.4					98.66203	
17.9					98.66203	
18.1					98.66203	
18.3					98.66203	
19					98.66203	
19.1					98.66203	
19.23	82.35294					
19.3			95.45454			
19.8					98.66203	
20.2					98.66203	
20.8					98.66203	
21.1					98.66203	
21.4					98.66203	
21.6					98.66203	
21.8					98.66203	
22.3					98.66203	
22.8					98.66203	
23.3					98.66203	
23.51			95.45454			
23.6					98.66203	
23.7	82.35294				98.66203	
24.26			95.45454			

	Data set-A	Data set-A	Data set-B	Data set-B	Data set-C	Data set-C
24.4					98.66203	
24.46	82.35294					
25.2					98.66203	
25.6					98.66203	
25.9					98.66203	
26.2					98.66203	
26.27			95.45454			
26.3					98.66203	
26.4					98.66203	
26.8					98.66203	
26.9					98.66203	
27.1					98.66203	
27.4					98.66203	
27.5					98.66203	
27.6					98.66203	
27.8					98.66203	
28.1					98.66203	
29					98.66203	
29.1					98.66203	
29.6					98.66203	
30.2					98.66203	
30.54			95.45454			
31					98.66203	
31.07	82.35294					
32.12			95.45454			
32.15	82.35294					
32.3					98.66203	
32.4					98.66203	
32.5					98.66203	
32.8					98.66203	
33					98.66203	
33.14	82.35294					
33.2					98.66203	
33.3					98.66203	
33.6					98.66203	
33.9					98.66203	
34.2					98.66203	
34.8					98.66203	
35.8					98.66203	
35.93			95.45454			
36.3					98.66203	
36.4					98.66203	
37.2					98.66203	
37.4					98.66203	
37.7					98.66203	
37.8					98.66203	
37.9					98.66203	
38.1					98.66203	
38.2					98.66203	
38.4					98.66203	
38.79			95.45454			
40					98.66203	
40.1					98.66203	
40.2					98.66203	

	Data set-A	Data set-A	Data set-B	Data set-B	Data set-C	Data set-C
40.3					98.66203	
40.6					98.66203	
40.8					98.66203	
41.4					98.66203	
41.6					98.66203	
41.69	82.35294					
42.1					98.66203	
42.7					98.66203	
42.87	82.35294					
43.2					98.66203	
43.9					98.66203	
44.2					98.66203	
44.7					98.66203	
44.9					98.66203	
45.1					98.66203	
45.7					98.66203	
46.8					98.66203	
47.2					98.66203	
47.3					98.66203	
47.5					98.66203	
47.51	82.35294					
47.9					98.66203	
48.4					98.66203	
48.6					98.66203	
48.8					98.66203	
49					98.66203	
49.5					98.66203	
50.1					98.66203	
50.2					98.66203	
50.5					98.66203	
50.7					98.66203	
50.93			95.45454			
51.4					98.66203	
52.3					98.66203	
52.5					98.66203	
52.9					98.66203	
53.2					98.66203	
53.82	82.35294					
54					98.66203	
55	82.35294					
55.1					98.66203	
55.6					98.66203	
55.9					98.66203	
56.5					98.66203	
57					98.66203	
57.7					98.66203	
58					98.66203	
58.2					98.66203	
58.5					98.66203	
58.6					98.66203	
58.9					98.66203	
59.2					98.66203	
59.21			95.45454			
59.3					98.66203	

	Data set-A	Data set-A	Data set-B	Data set-B	Data set-C	Data set-C
60.2					98.66203	
60.46	82.35294					
60.6					98.66203	
60.7					98.66203	
61					98.66203	
61.6					98.66203	
61.8					98.66203	
62.1					98.66203	
62.2					98.66203	
63.2					98.66203	
63.6					98.66203	
64.7					98.66203	
64.9					98.66203	
65.59			95.45454			
65.62			95.45454			
66.8					98.66203	
66.9					98.66203	
67.6					98.66203	
68.4					98.66203	
68.6					98.66203	
68.7					98.66203	
69.2					98.66203	
69.9					98.66203	
70.1					98.66203	
70.3					98.66203	
70.6					98.66203	
71					98.66203	
71.4					98.66203	
71.7					98.66203	
72					98.66203	
73.7					98.66203	
73.8					98.66203	
74.7					98.66203	
74.8					98.66203	
75.2					98.66203	
75.3					96.13223	2.580968
75.4					96.13223	
76					96.13223	
76.2					96.13223	
76.4					96.13223	
76.7					96.13223	
76.8					96.13223	
77.1					96.13223	
77.7					96.13223	
79.36	82.35294					
79.7					96.13223	
82.1					96.13223	
82.2					96.13223	
82.4					96.13223	
83.3					96.13223	
83.5					96.13223	
84			95.45454			
84.5					96.13223	
84.89			95.45454			

	Data set-A	Data set-A	Data set-B	Data set-B	Data set-C	Data set-C
85					96.13223	
85.4					96.13223	
85.5					96.13223	
85.6					96.13223	
86.1					96.13223	
86.8					96.13223	
87.5					96.13223	
87.7					96.13223	
88.9					96.13223	
89.3					96.13223	
89.7					96.13223	
90.2					96.13223	
90.7					96.13223	
93.9					96.13223	
94.2					96.13223	

Comparison of Survival Curves: A with C (rAAA with elective AAA)

Logrank Test
Chi square 32.13
df 1
P value P<0.0001
P value summary ***
Are the survival curves sig different? Yes

Median survival
Data 1:Data Set-A Undefined
Data 1:Data Set-C Undefined

Hazard Ratio
Ratio 13.61
95% CI of ratio 61.18 to 4735

Comparison of Survival Curves: B with C (acute nrAAA with elective AAA)

Logrank Test
Chi square 1.211
df 1
P value 0.2710
P value summary ns
Are the survival curves sig different? No

Median survival
Data 1:Data Set-B Undefined
Data 1:Data Set-C Undefined

Hazard Ratio
Ratio 3.132
95% CI of ratio 0.2280 to 193.4

Comparison of Survival Curves: A with B (rAAA with acute nrAAA)

Logrank Test
Chi square 2.025
df 1
P value 0.1548
P value summary ns
Are the survival curves sig different? No

Median survival
Data 1:Data Set-A Undefined
Data 1:Data Set-B Undefined

Hazard Ratio
Ratio 4.105
95% CI of ratio 0.6607 to 13.61

Appendix III (online only). Kaplan-Meier data—cumulative secondary intervention

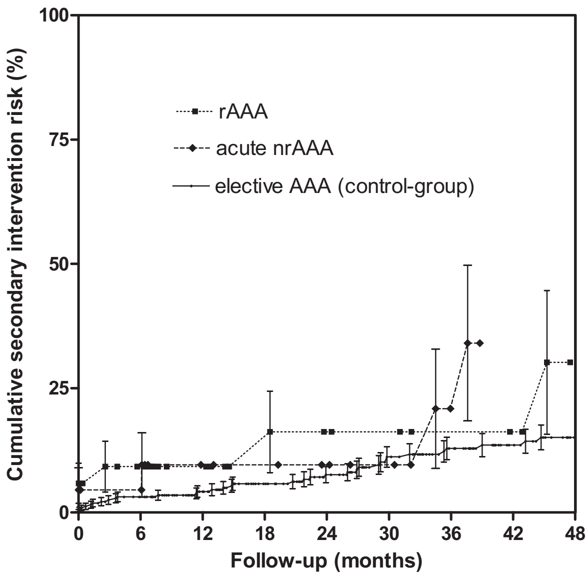

Fig 1. Data presented with standard error bars. *rAAA*, Ruptured abdominal aortic aneurysm; *nrAAA*, nonruptured AAA.

Numbers at risk

	Data set-A	Data set-B	Data set-C
0	34	22	322
0.01	34	22	322
0.1			319
0.13	30		
0.2		21	316
0.3			315
0.39	29		
0.7			314
1.2			313
1.4			312
1.9			311
2.2			310
2.6	28		308
2.9			307

Numbers at risk

	Data set-A	Data set-B	Data set-C
3.6			306
3.75	27		
3.8			305
4.4			304
5.3			303
5.69	26		
5.9			302
6.08		20	
6.12		19	
6.31	25		
6.35	24		
6.38	23		
6.4			299
6.41		18	
6.6			297
6.71		17	
6.74	22		
7			296
7.1			295
7.13	21		
7.17	20		
7.2			294
7.4			293
7.69	19		
7.7			291
7.8			290
8.1			289
8.3			288
8.5			285
8.52	18		
8.7			284
9.1			282
9.3			280
9.5			279
10.1			277
10.4			276
10.6			273
10.7			271
10.9			270
11			269
11.2			268
11.4			266
11.5			264
11.7			263
11.84		16	
12			262
12.1			261
12.33	17		
12.5			259
12.6			257
12.79	16		
12.9			255
13.05		15	
13.3			254

Numbers at risk

	Data set-A	Data set-B	Data set-C
13.4			253
13.5			252
13.6			251
13.7			250
13.9			248
14			245
14.1			244
14.17	15		
14.3			242
14.56	14		
14.8			241
14.9			239
15			238
15.1			236
15.5			235
16.2			232
16.4			231
16.7			230
16.9			229
17.1			228
17.4			227
17.9			225
18.1			223
18.3			222
18.51	13		
19			220
19.1			219
19.3		14	
19.8			218
20.2			215
20.7			212
20.8			211
21.1			209
21.3			207
21.4			206
21.6			205
21.8			203
22.3			202
22.4			201
22.8			200
23.3			199
23.51		13	
23.6			198
23.7	12		197
23.9			196
24.26		12	
24.4			195
24.46	11		
25.2			194
25.6			193
25.9			192
26			191
26.2			190
26.27		11	

Numbers at risk

	Data set-A	Data set-B	Data set-C
26.3			189
26.4			188
26.8			187
26.9			186
27.1			185
27.4			182
27.5			181
27.6			180
27.8			179
28.1			178
29			176
29.1			174
29.2			173
29.6			172
29.8			171
30.2			169
30.54		10	
31			167
31.07	10		
32			166
32.12		9	
32.15	9		
32.3			165
32.4			164
32.5			162
32.8			161
33			160
33.2			159
33.3			157
33.6			156
33.9			154
34.2			153
34.52		8	
34.8			152
35.3			150
35.6			149
35.8			148
35.93		7	
36.3			145
36.4			144
37.2			143
37.4			142
37.61		6	
37.7			139
37.8			137
37.9			136
38.1			135
38.2			134
38.4			132
38.79		5	
39			129
40			128
40.1			127
40.2			126

Numbers at risk

	Data set-A	Data set-B	Data set-C
40.3			125
40.6			124
40.8			122
41.4			120
41.6			119
41.69	8		
42.1			118
42.7			116
42.87	7		
43.2			115
43.9			114
44.2			112
44.7			111
44.9			110
45.1			109
45.27	6		
45.7			108
46.8			106
47.2			105
47.3			104
47.5			103
47.51	5		
47.9			102
48.4			100
48.6			98
48.8			97
49			95
49.5			94
50.1			92
50.5			90
50.6			89
50.7			88
50.93		4	
51			87
51.4			86
52.3			85
52.5			83
53.2			81
53.82	4		
54			80
55	3		
55.1			79
55.6			78
55.9			77
56.2			75
56.5			74
57			73
57.7			72
58.2			71
58.5			70
58.6			69
58.9			68
59.2			67
59.21		3	

Numbers at risk

	Data set-A	Data set-B	Data set-C
59.3			66
60.2			65
60.46	2		
60.6			64
60.7			63
61			61
61.6			60
61.8			59
62.1			57
62.2			56
63.2			55
63.6			54
64.7			51
64.9			50
65.59		2	
65.62		1	
66.8			49
67.6			48
68.4			47
69.2			46
69.9			45
70.1			44
70.3			41
71			40
71.4			39
71.7			37
72			36
73.7			35
73.8			33
74.8			32
75.2			30
75.4			29
76			28
76.2			27
76.4			26
76.7			25
76.8			24
77.1			23
77.7			22
79.7			21
82.1			20
82.2			16
82.4			15
83.15	1		
83.3			13
83.5			12
85.4			11
85.6			10
86.1			9
86.8			7
87.5			6
88.9			5
90.2			3
90.7			2

Numbers at risk

	Data set-A	Data set-B	Data set-C
93.9			1

Survival proportions (cumulative risk of secondary intervention)

	Data set-A	Data set-A	Data set-B	Data set-B	Data set-C	Data set-C
0	0		0		0	
0.01	5.882355	4.035261	4.545456	4.440948	0.310562	0.310076
0.1					0.623062	0.439203
0.13	5.882355					
0.2			4.545456		0.623062	
0.3					0.938545	0.539342
0.39	5.882355					
0.7					1.254028	0.623099
1.2					1.569511	0.69641
1.4					1.884995	0.762294
1.9					1.884995	
2.2					2.201492	0.822921
2.6	9.243698	5.10256			2.201492	
2.9					2.520058	0.879742
3.6					2.838615	0.932762
3.75	9.243698					
3.8					3.157181	0.982598
4.4					3.157181	
5.3					3.157181	
5.69	9.243698					
5.9					3.157181	
6.08			4.545456			
6.12			9.569382	6.450739		
6.31	9.243698					
6.35	9.243698					
6.38	9.243698					
6.4					3.157181	
6.41			9.569382			
6.6					3.157181	
6.71			9.569382			
6.74	9.243698					
7					3.157181	
7.1					3.157181	
7.13	9.243698					
7.17	9.243698					
7.2					3.157181	
7.4					3.157181	
7.69	9.243698					
7.7					3.489975	1.034043
7.8					3.489975	
8.1					3.489975	
8.3					3.489975	
8.5					3.489975	
8.52	9.243698					
8.7					3.489975	
9.1					3.489975	

	Data set-A	Data set-A	Data set-B	Data set-B	Data set-C	Data set-C
9.3					3.489975	
9.5					3.489975	
10.1					3.489975	
10.4					3.489975	
10.6					3.489975	
10.7					3.489975	
10.9					3.489975	
11					3.489975	
11.2					3.489975	
11.4					3.852791	1.091954
11.5					4.216988	1.146945
11.7					4.216988	
11.84			9.569382			
12					4.216988	
12.1					4.216988	
12.33	9.243698					
12.5					4.216988	
12.6					4.216988	
12.79	9.243698					
12.9					4.592606	1.202382
13.05			9.569382			
13.3					4.592606	
13.4					4.592606	
13.5					4.592606	
13.6					4.592606	
13.7					4.592606	
13.9					4.592606	
14					4.982025	1.258957
14.1					4.982025	
14.17	9.243698					
14.3					4.982025	
14.56	9.243698					
14.8					5.376289	1.314019
14.9					5.772202	1.366865
15					5.772202	
15.1					5.772202	
15.5					5.772202	
16.2					5.772202	
16.4					5.772202	
16.7					5.772202	
16.9					5.772202	
17.1					5.772202	
17.4					5.772202	
17.9					5.772202	
18.1					5.772202	
18.3					5.772202	
18.51	16.22495	8.195942				
19					5.772202	
19.1					5.772202	
19.3			9.569382			
19.8					5.772202	
20.2					5.772202	
20.7					6.216675	1.430859
20.8					6.216675	

	Data set-A	Data set-A	Data set-B	Data set-B	Data set-C	Data set-C
21.1					6.216675	
21.3					6.216675	
21.4					6.216675	
21.6					6.216675	
21.8					6.678665	1.496535
22.3					6.678665	
22.4					7.142944	1.559448
22.8					7.142944	
23.3					7.142944	
23.51			9.569382			
23.6					7.142944	
23.7	16.22495				7.142944	
23.9					7.616707	1.62186
24.26			9.569382			
24.4					7.616707	
24.46	16.22495					
25.2					7.616707	
25.6					7.616707	
25.9					7.616707	
26					8.100388	1.683948
26.2					8.100388	
26.27			9.569382			
26.3					8.100388	
26.4					8.100388	
26.8					8.100388	
26.9					8.594475	1.745875
27.1					9.088562	1.804997
27.4					9.088562	
27.5					9.088562	
27.6					9.088562	
27.8					9.088562	
28.1					9.088562	
29					9.605103	1.867189
29.1					9.605103	
29.2					10.12762	1.928121
29.6					10.12762	
29.8					11.17876	2.043815
30.2					11.17876	
30.54			9.569382			
31					11.17876	
31.07	16.22495					
32					11.71382	2.100376
32.12			9.569382			
32.15	16.22495					
32.3					11.71382	
32.4					11.71382	
32.5					11.71382	
32.8					11.71382	
33					11.71382	
33.2					11.71382	
33.3					11.71382	
33.6					11.71382	
33.9					11.71382	
34.2					11.71382	

	Data set-A	Data set-A	Data set-B	Data set-B	Data set-C	Data set-C
34.52			20.87321	11.98598		
34.8					11.71382	
35.3					12.3024	2.167271
35.6					12.89097	2.231215
35.8					12.89097	
35.93			20.87321			
36.3					12.89097	
36.4					12.89097	
37.2					12.89097	
37.4					12.89097	
37.61			34.061	15.64283		
37.7					12.89097	
37.8					12.89097	
37.9					12.89097	
38.1					12.89097	
38.2					12.89097	
38.4					12.89097	
38.79			34.061			
39					13.56623	2.313846
40					13.56623	
40.1					13.56623	
40.2					13.56623	
40.3					13.56623	
40.6					13.56623	
40.8					13.56623	
41.4					13.56623	
41.6					13.56623	
41.69	16.22495					
42.1					13.56623	
42.7					13.56623	
42.87	16.22495					
43.2					14.31783	2.412709
43.9					14.31783	
44.2					14.31783	
44.7					15.08974	2.51142
44.9					15.08974	
45.1					15.08974	
45.27	30.18746	14.46056				
45.7					15.08974	
46.8					15.08974	
47.2					15.08974	
47.3					15.08974	
47.5					15.08974	
47.51	30.18746					
47.9					15.08974	
48.4					15.08974	
48.6					15.08974	
48.8					15.08974	
49					15.08974	
49.5					15.08974	
50.1					15.08974	
50.5					15.08974	
50.6					16.04379	2.658246
50.7					16.04379	

	Data set-A	Data set-A	Data set-B	Data set-B	Data set-C	Data set-C
50.93			34.061			
51					17.0088	2.797376
51.4					17.0088	
52.3					17.0088	
52.5					17.0088	
53.2					17.0088	
53.82	30.18746					
54					17.0088	
55	30.18746					
55.1					17.0088	
55.6					17.0088	
55.9					17.0088	
56.2					18.11536	2.970884
56.5					18.11536	
57					18.11536	
57.7					18.11536	
58.2					18.11536	
58.5					18.11536	
58.6					18.11536	
58.9					18.11536	
59.2					18.11536	
59.21			34.061			
59.3					18.11536	
60.2					18.11536	
60.46	30.18746					
60.6					18.11536	
60.7					18.11536	
61					18.11536	
61.6					18.11536	
61.8					18.11536	
62.1					18.11536	
62.2					18.11536	
63.2					18.11536	
63.6					19.63174	3.280109
64.7					19.63174	
64.9					19.63174	
65.59			34.061			
65.62			34.061			
66.8					19.63174	
67.6					19.63174	
68.4					19.63174	
69.2					19.63174	
69.9					19.63174	
70.1					19.63174	
70.3					19.63174	
71					19.63174	
71.4					19.63174	
71.7					19.63174	
72					19.63174	
73.7					19.63174	
73.8					19.63174	
74.8					19.63174	
75.2					19.63174	
75.4					19.63174	

	Data set-A	Data set-A	Data set-B	Data set-B	Data set-C	Data set-C
76					19.63174	
76.2					19.63174	
76.4					19.63174	
76.7					19.63174	
76.8					19.63174	
77.1					19.63174	
77.7					19.63174	
79.7					19.63174	
82.1					19.63174	
82.2					19.63174	
82.4					19.63174	
83.15	30.18746					
83.3					19.63174	
83.5					19.63174	
85.4					19.63174	
85.6					19.63174	
86.1					19.63174	
86.8					19.63174	
87.5					19.63174	
88.9					19.63174	
90.2					19.63174	
90.7					19.63174	
93.9					19.63174	

Comparison of Survival Curves: A with C (rAAA with elective AAA)

Logrank Test
Chi square 2.245
df 1
P value 0.1341
P value summary ns
Are the survival curves sig different? No

Median survival
Data 1:Data Set-A Undefined
Data 1:Data Set-C Undefined

Hazard Ratio
Ratio 2.007
95% CI of ratio 0.7453 to 9.037

Comparison of Survival Curves: B with C (acute nrAAA with elective AAA)

Logrank Test
Chi square 1.526
df 1
P value 0.2167
P value summary ns
Are the survival curves sig different? No

Median survival
Data 1:Data Set-B Undefined
Data 1:Data Set-C Undefined

Hazard Ratio
Ratio 1.892
95% CI of ratio 0.6059 to 9.109

Comparison of Survival Curves: A with B (rAAA with acute nrAAA)

Logrank Test
Chi square 0.007324
df 1
P value 0.9318
P value summary ns
Are the survival curves sig different? No

Median survival
Data 1:Data Set-A Undefined
Data 1:Data Set-B Undefined

Hazard Ratio
Ratio 0.9448
95% CI of ratio 0.2488 to 3.577