Strategy 169717/saved

Contents 42 of 42 results on Saved Results

1. Lower limb paralysis from ischaemic neuropathy of the lumbosacral plexus following aorto-iliac procedures.
2. Sealing zones have a greater influence than iliac anatomy on the occurrence of limb occlusion following endovascular aortic aneurysm repair.
4. Predictive factors for limb occlusions after endovascular aneurysm repair.
5. The impact of early pelvic and lower limb reperfusion and attentive peri-operative management on the incidence of spinal cord ischemia during thoracoabdominal aortic aneurysm endovascular repair.
6. Limb ischemia after EVAR: an effect of the obstructing introducer?
7. Stent-graft limb deployment in the external iliac artery increases the risk of limb occlusion following endovascular AAA repair.
9. [Stagewise treatment of a patient with multifocal atherosclerosis, limb ischaemia, and surgical infection].
13. Bifurcated aortoiliac endograft limb occlusion during deployment and its bailout conversion using the external iliac artery to internal iliac artery endograft technique.
14. Factors Predisposing to Endograft Limb Occlusion after Endovascular Aortic Repair.
15. Incidence and treatment results of Endurant endograft occlusion.
17. Adjunctive iliac stents reduce the risk of stent-graft limb occlusion following endovascular aneurysm repair with the Zenith stent-graft.
20. Regarding "Endograft limb occlusion and stenosis after ANCURE endovascular abdominal aneurysm repair".
23. Occlusion of the common and internal iliac arteries for aortoiliac aneurysm repair: experience with the Amplatzer vascular plug.
24. Management of acute type B aortic dissections and acute limb ischemia.
26. Strategies that minimize the risk of iliac limb occlusion after EVAR.
27. [Lower body ischemia due to bending of the stent after hybrid treatment for chronic stanford type B aortic dissection].
28. Response to letter to the editor: 'Re: Endograft limb occlusion in EVAR: iliac tortuosity quantified by three different indices on the basis of pre-operative CTA'.

29. Commentary on: "Endograft limb occlusion in EVAR: iliac tortuosity quantified by three different indices on the basis of preoperative CTA".

30. Re: 'Endograft limb occlusion in EVAR: iliac tortuosity quantified by three different indices on the basis of pre-operative CTA'.

31. Successful endovascular repair in two cases of graft limb occlusion after endovascular aneurysm repair for abdominal aortic aneurysms.


33. Successful Endovascular Management of Intraoperative Graft Limb Occlusion and Iliac Artery Rupture Occurred during Endovascular Abdominal Aortic Aneurysm Repair.

34. Type B aortic dissection after endovascular abdominal aortic aneurysm repair causing endograft collapse and severe malperfusion.

35. Ischemic complications after endovascular abdominal aortic aneurysm repair.


37. Limb occlusion after endovascular repair of abdominal aortic aneurysms with supported endografts.

38. [Occlusion of endovascular stent-graft for abdominal aortic aneurysm three years after surgery]


40. Endograft limb occlusion and stenosis after ANCURE endovascular abdominal aneurysm repair.

41. Endovascular repair of graft limb occlusion after endovascular repair for abdominal aortic aneurysm using 0.014-inch guidewire and coronary balloon.

42. Endovascular graft limb occlusion.
1. Lower limb paralysis from ischaemic neuropathy of the lumbosacral plexus following aorto-iliac procedures.

Authors: Abdellaoui, Adel; West, Nick J; Tomlinson, Mark A; Thomas, Martin H; Browning, Neil
Source: Interactive cardiovascular and thoracic surgery; Aug 2007; vol. 6 (no. 4); p. 501-502
Publication Date: Aug 2007
Publication Type(s): Case Reports Journal Article
Database: Medline
Available in full text at Interactive Cardiovascular and Thoracic Surgery from Free Access Content
Available in full text at Interactive CardioVascular and Thoracic Surgery from Highwire Press
Available in full text at Interactive Cardiovascular and Thoracic Surgery from Free Access Content

Abstract
OBJECTIVES: Neurological injuries following aorto-iliac procedures are rare, unpredictable and cause significant morbidity. We report four cases of lower limb paralysis following aorto-iliac procedures, in which two patients suffered internal iliac occlusion and discuss potential aetiological factors.

METHODS: Four male patients, age ranging between 56 and 77 years, underwent aorto-iliac procedures. Three patients underwent repair of infrarenal abdominal aortic aneurysm (2 open and 1 endovascular repair) and one patient had percutaneous angioplasty of the internal iliac artery.

RESULTS: All patients developed a unilateral lower limb paralysis early post procedure. Neurophysiological studies were performed in three patients and confirmed the injury to the lumbosacral plexus in two cases. MRI scan performed in two patients did not show any abnormality. In two of the cases, occlusion of one internal iliac artery was implicated as the cause of lumbo-sacral plexopathy: one with the coverage of the internal artery origin with the stent, the other due to thrombotic occlusion of common and internal iliac in arteries after an elective open repair of abdominal aortic aneurysm with a bifurcated graft.

Follow up ranged between 2 and 4 months. Only one patient recovered completely; the other three were left with permanent disability.

CONCLUSIONS: Ischaemic neuropathy following aorto-iliac intervention, whether open or endovascular, remains a rare, unpredictable and devastating complication. When it occurs it is likely to result in permanent neurological disability. It is important to note that it may be related to internal iliac artery thrombosis.

2. Sealing zones have a greater influence than iliac anatomy on the occurrence of limb occlusion following endovascular aortic aneurysm repair.

Authors: Daoudal, Anne; Cardon, Alain; Verhoye, Jean-Philippe; Clochard, Elodie; Lucas, Antoine; Kaladji, Adrien
Source: Vascular; Jun 2016; vol. 24 (no. 3); p. 279-286
Publication Date: Jun 2016
Publication Type(s): Journal Article
Database: Medline

Abstract
Limb occlusion is a well-known complication following endovascular aortic aneurysm repair (EVAR), and it very often leads to reoperation. The aim of this study is to identify predictive factors for limb occlusion following EVAR. Two hundred and twenty-four patients undergoing EVAR between 2004 and 2012 were included in this retrospective study. Demographics, anatomic, and follow-up data were compared between two groups (with or without thrombosis). Preoperative anatomy was analyzed with a dedicated workstation, using the Society of Vascular Surgery reporting standards. Eleven (4.9%) patients presented with a limb occlusion during follow-up (46 ± 12 months). Univariate analyses were first performed to investigate the influence of preoperative variables on limb occlusion. Then, variables with a p value <0.1 were included in the multivariate analysis and showed that in the occlusion group there was a greater rate of chronic renal failure (18.2% vs. 3.8%, p = 0.012), a more frequent occurrence of distal landing zones in the external iliac artery (15.4% vs. 2.1%, p = 0.006), and a smaller aortic neck diameter (21.0 ± 2.9 mm vs. 23.6 ± 3.3 mm, p = 0.014). Although iliac anatomy does not appear to have a significant influence on limb occlusion rate in the multivariate analysis, proximal and distal sealing zones appear to be involved in this complication.


Authors: Fernández-Alonso, L; Olea, J
Source: The Journal of cardiovascular surgery; Dec 2006; vol. 47 (no. 6); p. 667-670
Publication Date: Dec 2006
Publication Type(s): Case Reports Journal Article
Database: Medline
Available in full text at Journal of Cardiovascular Surgery from ProQuest
Abstract

Endovascular repair of aortic aneurysm has become a viable treatment option in selected patients. However, despite the minimally invasive nature of this treatment a significant incidence of vascular complications has been reported. Here, we report two cases of acute limbs ischemia due to endograft thrombosis in patients treated with aortouni-iliac devices and we review the etiologic factors related with these events and the treatment options. We suggest that the presence of atherosclerotic plaques within the outflow arteries and coexistent infrainguinal arterial occlusive disease (poor runoff) is an underestimated factor in the risk of graft thrombosis, especially in patients treated with aortouni-iliac devices and we advocate the use in the early follow-up surveillance after endovascular repair of aortic aneurysm of noninvasive test such duplex scanning, segmental pressures and ankle-brachial indices to assess the presence or progress of coexistent occlusive disease. We also suggest that some adverse outcomes ascribed to device failure might be more properly charged to inappropriate patient selection.

4. Predictive factors for limb occlusions after endovascular aneurysm repair.

Authors
Faure, Elsa M; Becquemin, Jean-Pierre; Cochenec, Frederic; ENGAGE collaborators

Source
Journal of vascular surgery; May 2015; vol. 61 (no. 5); p. 1138

Publication Date
May 2015

Publication Type(s)
Journal Article Review

Database
Medline

Available in full text at Journal of Vascular Surgery from Elsevier

Abstract

OBJECTIVE Greater flexibility and smaller sizes for introducer sheaths in the newest stent grafts increase the feasibility of endovascular aneurysm repair but raise concerns about long-term limb patency. The aim of the study was to determine the incidence of and predictive factors for limb occlusion after use of the Endurant stent graft (Medtronic Inc, Minneapolis, Minn) for abdominal aortic aneurysm. METHODS The Endurant Stent Graft Natural Selection Global Postmarket Registry (ENGAGE) prospectively included 1143 patients treated with bifurcated devices who were observed for up to 2 years. Limb occlusions were evidenced by computed tomography, angiography, or ultrasound. To predict stent graft limb occlusion, a two-step model-building technique was applied. We first identified predictors from a total of 47 covariates obtained at baseline and in the periprocedural period. Subsequently, we reduced the set of potential predictors to key factors that are clinically meaningful. To handle large numbers of covariates, we used the Classification And Regression Tree (CART) method. RESULTS Forty-two stent graft limbs occluded in 39 patients (3.4% of the patients). At 2 years, the rate of freedom from stent graft limb occlusion calculated by Kaplan-Meier plot was 97.9% (standard error [SE], 0.33%). Of the 42 occlusions, 13 (31%) were observed within 30 days and 30 (71%) within 6 months. The strongest independent predictors were distal landing zone on the external iliac artery, external iliac artery diameter ≤10 mm, and kinking. High-risk vs low-risk patients were identified according to a decision tree based on the strongest predictors. Freedom from stent graft limb occlusion was 96.1% (SE, 0.64%) in high-risk patients vs 99.6% (SE, 0.19%) in low-risk patients. CONCLUSIONS After Endurant stent grafting, the incidence of limb occlusion was low. Classifying patients as high risk vs low risk according to the algorithm used in this study may help define specific strategies to prevent limb occlusion and improve the overall results of endovascular aneurysm repair using the latest generation of stent grafts.

5. The impact of early pelvic and lower limb reperfusion and attentive peri-operative management on the incidence of spinal cord ischemia during thoracoabdominal aortic aneurysm endovascular repair.

Authors
Maurel, B; Delclaux, N; Sobocinski, J; Hertault, A; Martin-Gonzalez, T; Moussa, M; Spear, R; Le Roux, M; Azaaoui, R; Tyrrell, M; Haulon, S

Source
European journal of vascular and endovascular surgery : the official journal of the European Society for Vascular Surgery; Mar 2015; vol. 49 (no. 3); p. 248-254

Publication Date
Mar 2015

Publication Type(s)
Multicenter Study Journal Article

Database
Medline

Available in full text at European Journal of Vascular and Endovascular Surgery from Elsevier
OBJECTIVE/BACKGROUND: Spinal cord ischemia (SCI) is a devastating complication following endovascular thoracoabdominal aortic aneurysm (TAAA) repair. In an attempt to reduce its incidence two peri-procedural changes were implemented by the authors in January 2010: (i) all large sheaths are withdrawn from the iliac arteries immediately after deploying the central device and before cannulation and branch extension to the visceral vessels; (ii) the peri-operative protocol has been modified in an attempt to optimize oxygen delivery to the sensitive cells of the cord (aggressive blood and platelet transfusion, median arterial pressure monitoring >85 mmHg, and systematic cerebrospinal fluid drainage). METHODS: Between October 2004 and December 2013, 204 endovascular TAAA repairs were performed using custom made devices manufactured with branches and fenestrations to maintain visceral vessel perfusion. Data from all of these procedures were prospectively collected in an electronic database. Early post-operative results in patients treated before (group 1, n = 43) and after (group 2, n = 161 patients) implementation of the modified implantation and peri-operative protocols were compared. RESULTS: Patients in groups 1 and 2 had similar comorbidities (median age at repair 70.9 years [range 65.2-77.0 years]), aneurysm characteristics (median diameter 58.5 mm [range 53-65 mm]), and length of procedure (median 190 minutes [range 150-240 minutes]). The 30 day mortality rate was 11.6% in group 1 versus 5.6% in group 2 (p = .09). The SCI rate was 14.0% versus 1.2% (p < .01). If type IV TAAAs were excluded from this analysis, the SCI rate was 25.0% (6/24 patients) in group 1 versus 2.1% (2/95 patients) in group 2 (p < .01). CONCLUSION: The early restoration of arterial flow to the pelvis and lower limbs, and aggressive peri-operative management significantly reduces SCI following type I-III TAAA endovascular repair. With the use of these modified protocols, extensive TAAA endovascular repairs are associated with low rates of SCI.

6. Limb ischemia after EVAR: an effect of the obstructing introducer?

Authors: Jonsson, Thomas; Larsson, Thomas; Jansson, Kjell; Arfvidsson, Berndt; Norgren, Lars

Source: Journal of endovascular therapy : an official journal of the International Society of Endovascular Specialists; Dec 2008; vol. 15 (no. 6); p. 695-701

Abstract: PURPOSE: To evaluate the splanchnic and limb metabolic effects of open repair (OR) of abdominal aortic aneurysms (AAA) versus endovascular aneurysm repair (EVAR) in a pilot study utilizing microdialysis. METHODS: Nine AAA patients (8 men; mean age 74 years, range 61-85) were treated with EVAR and 9 had an OR (5 men; mean age 70 years, range 55-85). In the EVAR cases, which were performed percutaneously, the external iliac artery was obstructed by the introducer to a mean functional stenosis of 70% (52%-100%). Catheters for microdialysis were placed subcutaneously above the ankle of the right leg and freely percutaneously, the external iliac artery was obstructed by the introducer to a mean functional stenosis of 70% (52%-100%). Catheters for microdialysis were placed subcutaneously above the ankle of the right leg and freely in the abdominal cavity to measure the levels of lactate and pyruvate. The lactate/pyruvate ratio was calculated as a measure of ischemia. Measurements started at the end of surgery and continued for 2 days. Mean values were compared using the Mann-Whitney U test. RESULTS: The mean value of intraperitoneal lactate during the first day after EVAR was 1.5+/-.0.7 mM versus 2.6+/-.0.8 mM after OR (p = 0.019). The lactate/pyruvate ratio was 10.2+/-.2.2 after EVAR and 12.3+/-.2.6 after OR (p = 0.113). Leg lactate mean values were 4.2+/-.2.0 mM after EVAR versus 1.8+/-.0.6 mM after OR (p<0.001). The lactate/pyruvate ratio was 20.1+/-.8.3 for EVAR and 13.7+/-.3.3 for OR (p = 0.040). These differences between EVAR and OR continued for the second day. CONCLUSION: Intraperitoneally, metabolism was slightly increased after OR; however, it was not suggestive of splanchnic ischemia. Leg findings reflected a more extensive ischemia after EVAR over 48 hours, which was a somewhat unexpected finding that may be related to the introducer’s impact on blood flow to the limb during the intervention. Although no clinical consequences were recorded, the finding suggests some benefit of minimizing as much as possible the time of reduced perfusion to the limb.

7. Stent-graft deployment in the external iliac artery increases the risk of limb occlusion following endovascular AAA repair.

Authors: Conway, Allan M; Modarai, Bijan; Taylor, Peter R; Carrrell, Tom W G; Waltham, Matthew; Salter, Richard; Bell, Rachel E

Source: Journal of endovascular therapy : an official journal of the International Society of Endovascular Specialists; Feb 2012; vol. 19 (no. 1); p. 79-85

Abstract: PURPOSE: To evaluate the splanchnic and limb metabolic effects of open repair (OR) of abdominal aortic aneurysms (AAA) versus endovascular aneurysm repair (EVAR) in a pilot study utilizing microdialysis. METHODS: Nine AAA patients (8 men; mean age 74 years, range 61-85) were treated with EVAR and 9 had an OR (5 men; mean age 70 years, range 55-85). In the EVAR cases, which were performed percutaneously, the external iliac artery was obstructed by the introducer to a mean functional stenosis of 70% (52%-100%). Catheters for microdialysis were placed subcutaneously above the ankle of the right leg and freely in the abdominal cavity to measure the levels of lactate and pyruvate. The lactate/pyruvate ratio was calculated as a measure of ischemia. Measurements started at the end of surgery and continued for 2 days. Mean values were compared using the Mann-Whitney U test. RESULTS: The mean value of intraperitoneal lactate during the first day after EVAR was 1.5+/-.0.7 mM versus 2.6+/-.0.8 mM after OR (p = 0.019). The lactate/pyruvate ratio was 10.2+/-.2.2 after EVAR and 12.3+/-.2.6 after OR (p = 0.113). Leg lactate mean values were 4.2+/-.2.0 mM after EVAR versus 1.8+/-.0.6 mM after OR (p<0.001). The lactate/pyruvate ratio was 20.1+/-.8.3 for EVAR and 13.7+/-.3.3 for OR (p = 0.040). These differences between EVAR and OR continued for the second day. CONCLUSION: Intraperitoneally, metabolism was slightly increased after OR; however, it was not suggestive of splanchnic ischemia. Leg findings reflected a more extensive ischemia after EVAR over 48 hours, which was a somewhat unexpected finding that may be related to the introducer’s impact on blood flow to the limb during the intervention. Although no clinical consequences were recorded, the finding suggests some benefit of minimizing as much as possible the time of reduced perfusion to the limb.
PURPOSETo assess whether deployment of an endograft limb in the external iliac artery (EIA) increases the rate of limb occlusion following endovascular aneurysm repair (EVAR).

METHODSInterrogation of a prospectively maintained database identified 661 patients (596 men; median age 73 years, range 37-93) with infrarenal abdominal aortic aneurysm who underwent EVAR between 1996 and 2010 using Zenith stent-grafts predominately. Of these, 567 patients [56 (9.9%) women] had both endograft limbs deployed in the CIA (1203 limbs at risk), while 94 patients [9 (9.6%) women] had at least 1 limb in the EIA (22 bilateral; 116 limbs at risk). An adjunctive bare metal stent was used in 8 (9%) limbs deployed in the EIA.

RESULTSThere were 31 limb occlusions, all unilateral: 17 (3%) patients in the CIA group had an occluded limb (1% of limbs at risk) vs. 14 (15%) patients in the EIA group (12% of limbs at risk; p<0.0001). The median time to occlusion was 3 months (0-60) in the CIA group and 1 month (0-36) in the EIA group. The majority of occlusions were treated by extra-anatomical revascularization, most often a femorofemoral crossover bypass. No legs were amputated following occlusion of a limb placed in the CIA, but there were 3 amputations in the EIA group (p=0.003).

CONCLUSIONDeployment of endograft limbs into the EIA led to a higher rate of occlusion and leg amputation. Increased tortuosity of the EIA and a smaller caliber vessel are likely to account for the increased risk.

Abstract


Authors
Ronsivalle, Salvatore; Faresin, Francesca; Franz, Francesca; Pedon, Luigi; Rettore, Carlo; Zonta, Loretta; Olivieri, Armando

Source
Annals of vascular surgery; Nov 2013; vol. 27 (no. 8); p. 1216-1222

Abstract
BACKGROUNDLower extremity ischemia for limb thrombosis is a well-known adverse event after endovascular abdominal aortic aneurysm repair (EVAR), ranging from 2.6-7.4%. We report our experience in the management of graft limb occlusion that occurred in patients who underwent EVAR in our institution. In cases in which balloon catheter thrombectomy is not useful or is risky, it is important to take into consideration the use of a Vollmar ring stripper (Aesculap, San Jose, CA) to avoid dislodging or disrupting the sealing zones. This technique has taken from thromboendarterectomy the principle of detaching plaque from adventitia and transformed it in a less traumatic way for dissecting thromboses from endografts.

METHODSBetween September 1999 and December 2011, 608 patients underwent EVAR in our institution. In cases of severe claudication or critical ischemia, we tried to remove the thrombus using mild Fogarty balloon traction; in cases of progressive and old stratification, we added the Vollmar ring stripper. After recanalization, if there was a stenosis, an angioplasty was performed and in most patients an adequately size Cheatham platinum stent was positioned. If the endovascular approach failed, bypass procedures were considered.

RESULTSIn 608 patients over a mean follow-up time of 72 months, there were 23 cases of limb thrombosis. Fifteen of the 23 limb occlusions were identified within 6 months after aneurysm repair. The mean time to occlusion was 8.2 ± 4.3 months (range: 20 days-25 months). Presenting symptoms were mild to moderate claudication (Rutherford classification I) in 3 patients (13%), medium severe claudication (Rutherford classification IIa) in 18 patients (78.3%), and paresthesia and rest pain (Rutherford classification IIb) in 2 patients (8.7%; 1 of those patients had a loss of motor function). Four (17.4%) were stable during follow-up, and in 1 of these cases we tried thrombolysis without thrombosis resolution. In 13 (56.5%) cases, we performed balloon catheter thrombectomy with a LeMaitre over the wire embolectomy catheter (LeMaitre Vascular, Burlington, MA). In 8 of 13 (61.5%) patients with certain thrombosis characteristics, we decided to add to the balloon catheter a Vollmar ring stripper for mechanical catheter thrombectomy. In all 13 thrombectomy cases, blood flow was restored through the limb with the endograft itself. There were no episodes of graft dislocation, disruption of the sealing zones, or recurrences. In 5 (21.7%) cases, a femorofemoral crossover was performed, and in 1 (4.3%) case, an axillofemoral bypass was performed. During the follow-up period, 2 of the 5 femorofemoral crossovers closed after 6 and 8 months, respectively.

CONCLUSIONSThis unclogging technique, alone or associated with Vollmar ring stripper, proves to be simple, safe, and effective in the treatment of graft limb occlusion. Additional research will help confirm the role of Vollmar ring stripper.

**Authors**
Hockings, Alexandra; Ooi, Sue Min; Mwipatayi, B P; Sieunarine, K

**Source**
Surgery today; 2007; vol. 37 (no. 7); p. 600-603

**Abstract**

UNLABELLED

The authors share herein their experience in successful treatment of a male patient with multifocal atherosclerosis and lower-limb critical ischaemia complicated by erysipelas. THE AIM OF THE WORK to show not only efficacy of iloprost (Ilomedin) used as conservative treatment in patients presenting with critical ischaemia and surgical infection in both pre- and postoperative periods in order to save the limb, but also the possibility of postponing reconstructive intervention, improving the patient's quality of life during this period, as well as shortening the duration of the postoperative period, and also to demonstrate both immediate outcomes of endovascular repair of an abdominal aortic aneurysm and remote results of comprehensive treatment for disseminated multifocal atherosclerosis with severe accompanying pathology.

**10. Predicting iliac limb occlusions after bifurcated aortic stent grafting: anatomic and device-related causes.**

**Authors**
Carrocio, Alfo; Faries, Peter L; Morrissey, Nicholas J; Teodorescu, Victoria; Burks, James A; Gravereaux, Edwin C; Hollier, Larry H; Marin, Michael L

**Source**
Journal of vascular surgery; Oct 2002; vol. 36 (no. 4); p. 679-684

**Abstract**

OBJECTIVE

Graft limb occlusion may complicate endovascular abdominal aortic aneurysm repair. The precise etiologic factors that contribute to the development of these graft limb thromboses have not been defined. We evaluated our experience with bifurcated aortic endografts to determine factors that may predict subsequent limb thrombosis. The management of the thrombosed limbs and the results after treatment were also investigated.

METHODS

During a 4-year period, 351 patients with aortic aneurysms underwent treatment with bifurcated endografts (702 graft limbs at risk). These 351 bifurcated devices included AneuRx (Medtronic, Minneapolis, Minn; n = 35), Ancure (Guidant, Menlo Park, Calif; n = 8), Gore (W.L. Gore & Associates, Sunnyvale, Calif; n = 25), Talent (World Medical, Sunrise, Fla; n = 255), Teramed (Teramed, Minneapolis, Minn; n = 10), and Vanguard (Boston Scientific Vascular, Natick, Mass; n = 18). Details regarding the type of device, mechanism of deployment, and aortoiliac artery anatomy were collected prospectively and analyzed. Graft limbs were analyzed for diameter, use of additional endograft iliac extensions, deployment in the external iliac artery, and endograft to vessel oversizing. Follow-up included physical examination, duplex ultrasonography, and spiral computed tomographic scans at 1 month, 6 months, and 12 months and annually thereafter. The follow-up period ranged from 2 to 54 months, with a mean follow-up period of 20 months.

RESULTS

Twenty-six of 702 limbs (3.7%) had an occlusion develop. The risk of limb thrombosis was associated with a smaller limb diameter. Mean graft limb diameter was 14 mm in the occluded population, and patent limbs had a mean diameter of 16 mm. Thrombosis occurred in 16 of 291 limbs (5.5%) that were 14 mm or less and in 10 of 411 limbs (2.4%) that were greater than 14 mm (P = .03). Extension of a graft to the external iliac artery was performed in 96 of the 702 limbs. Eight of these 96 limbs (8.3%) had thrombosis develop as compared with 18 of 606 (3.0%) that extended to the common iliac artery (P = .01). No significant association was present between limb thrombosis and the contralateral or ipsilateral side of a device, the configuration of the iliac graft limb end (closed web, open web, or bare spring), or the degree of iliac graft limb oversizing. AneuRx, Ancure, Vanguard, and Talent grafts each sustained limb occlusions, with no occlusions seen among the Gore and Teramed devices. No significant increased risk of graft limb thrombosis was observed in unsupported grafts (1/16; 6.3%) versus supported grafts (25/686; 3.6%; P = not significant). Thromboses occurred between 1 day and 23 months after surgery. Thirteen of the 26 thromboses (50%) occurred within 30 days of surgery. Presenting symptoms were mild to moderate claudication in eight patients (30.8%), severe claudication in 16 patient (61.5%), and paresthesia and rest pain in two patients (7.7%). Eighteen of 26 patients (69.2%) eventually needed intervention to reestablish flow to the occluded limb, including thrombolysis and stenting in two patients (7.7%), axillary femoral bypass in one patient (3.8%), femoral-femoral bypass in 13 patients (50.0%), and axillary-bifemoral bypass in two patients (7.7%). All patients with mild to moderate symptoms under observation had improvement in symptoms with no further interventions necessary. All revascularizations were successful in relieving symptoms.

CONCLUSION

Graft limb occlusion is a recognized complication of endovascular treatment of abdominal aortic aneurysms that may be associated with smaller graft limb diameter and extension to the external iliac artery. Occlusions usually necessitate additional intervention for resolution of ischemic symptoms. The use of small diameter grafts should be avoided when possible to reduce the risk of graft limb occlusions.
Abstract
An endovascular aneurysm repair has become an important therapeutic option for the management of patients with aortic aneurysms. Early advantages of the endovascular technique have been well documented. Patients with aortic aneurysms undergoing these procedures are usually elderly, which increases the likelihood of comorbidities. With the increased use of vascular devices, potential complications such as graft limb occlusion need to be widely understood, so they can be recognized and treated early. We recently treated an 85-year-old man with acute endovascular graft limb occlusion after an elective anterior resection for rectal cancer, and we discuss some factors that may have contributed to this complication.

Authors Milner, Ross; Golden, Michael A; Velazquez, Omaida C; Fairman, Ronald M
Source Journal of vascular surgery; Jun 2003; vol. 37 (no. 6); p. 1329-1331
Publication Date Jun 2003
Publication Type(s) Case Reports Journal Article
Database Medline
Available in full text at Journal of Vascular Surgery from Free Access Content
Abstract Endovascular aneurysm repair continues to become increasingly popular. As the number of implanted endografts increases, complications will increase as well. We report a new approach to endovascular treatment in two patients with acute iliac limb occlusions of a bifurcated aortic endograft with an endoskeleton. Neither patient required femoral-femoral bypass grafting because of unilateral limb ischemia. We believe this is the optimal primary approach in patients with a bifurcated stent graft with an endoskeleton.

13. Bifurcated aortoiliac endograft limb occlusion during deployment and its bailout conversion using the external iliac artery to internal iliac artery endograft technique.
Authors Kehagias, Elias; Kontopodis, Nikolaos; Tsetis, Dimitrios; Ioannou, Christos V
Source Annals of vascular surgery; Jul 2015; vol. 29 (no. 5); p. 1029-1034
Publication Date Jul 2015
Publication Type(s) Case Reports Journal Article
Database Medline
Available in full text at Annals of Vascular Surgery from Elsevier
Abstract Endovascular aneurysm repair has become the preferred method to treat abdominal aortic aneurysms (AAAs). The Ovation TriVascular Stent-Graft system introduces a unique concept of separation of the metal (stent) and fabric (graft) portion of the endograft's main body to facilitate delivery through ultra-low profile 14F devices. In the setting of a narrow distal aneurysmal lumen, usually due to the presence of thrombus, deployment of this endograft may be complicated by folding and collapse of the (unsupported by a stent) aortic body or limbs, making catheterization and ballooning impossible. We present a case of Ovation endograft contralateral limb collapse in a tight AAA lumen due to thrombus deposition, which led to folding and total occlusion of the limb and made limb catheterization impossible. This is a real-life example of how the external iliac artery to internal iliac artery endograft technique may be used as a bailout procedure, converting the procedure into an aortouni-iliac graft. To our knowledge, this is the first reported bailout use of this technique in English literature which may be used in selected cases.

14. Factors Predisposing to Endograft Limb Occlusion after Endovascular Aortic Repair.
Authors Mantas, G K; Antonopoulos, C N; Sfyroeras, G S; Moulakakis, K G; Kakisis, J D; Mylonas, S N; Liapis, C D
Source European journal of vascular and endovascular surgery : the official journal of the European Society for Vascular Surgery; Jan 2015; vol. 49 (no. 1); p. 39-44
Publication Date Jan 2015
Publication Type(s) Journal Article
Database Medline
Available in full text at European Journal of Vascular and Endovascular Surgery from Elsevier
Abstract

OBJECTIVE: The aim of this study was to investigate risk factors for endograft limb occlusion after endovascular abdominal aneurysm repair (EVAR), using a case control design. METHODS: All patients presenting with endograft limb occlusion after elective EVAR between January 2010 and June 2013, along with age, sex, and type of endograft matched controls were included in the study. The impact of atherosclerotic risk factors, anatomic characteristics of the aneurysm, procedural details, and antiplatelet therapy was investigated. Multivariate logistic regression analysis and conditional logistic regression analysis for 1:3 matched pairs deriving adjusted odds ratios (ORs) with 95% confidence intervals (CIs) in order to detect significant risk factors for endograft limb occlusion among cases and controls were modeled. RESULTS: Of the 439 patients treated by EVAR, 18 patients (4.1%) presented with endograft limb occlusion. These patients were compared to 54 matched controls. Limb occlusion was associated with iliac artery angulation ≥ 60° (OR = 5.76, 95% CI = 1.24-26.74; p = .03) or perimeter calcification ≥ 50% (OR = 5.87, 95% CI = 1.10-31.32; p = .04). Limb occlusion was also associated with ≥ 15% endograft oversizing in the common iliac artery (OR = 5.54, 95% CI = 1.11-27.60; p = .04). No other risk factors for limb occlusion were recognized. CONCLUSIONS: The presence of significant angulation and calcification of the iliac arteries as well as excessive limb oversizing appear to be independent predictors of endograft limb occlusion after EVAR.

15. Incidence and treatment results of Endurant endograft occlusion.

Authors: van Zeggeren, Laura; Bastos Gonçalves, Frederico; van Herwaarden, Joost A; Zandvoort, Herman J A; Werson, Debora A B; Vos, Jan-Albert; Moll, Frans L; Verhagen, Hence J; de Vries, Jean-Paul P M

Source: Journal of vascular surgery; May 2013; vol. 57 (no. 5); p. 1246

Abstract

OBJECTIVE: The Endurant endograft (Medtronic Inc, Minneapolis, Minn) is a new-generation device specifically developed to perform well in complex abdominal aortic aneurysm anatomy. Previous reports on the 1- and 2-year results of endovascular aneurysm repair (EVAR) with the Endurant endograft showed excellent outcome, including prevention of migration and type I endoleaks, but occurrence and outcome of post-EVAR occlusion have not been determined in a large multicenter patient cohort with midterm follow-up, which is the objective of this study. METHODS: Data of consecutive patients treated with the Endurant from December 2007 to April 2012 in three Dutch tertiary vascular referral hospitals were prospectively gathered and retrospectively analyzed. Follow-up consisted of regular office visits, computed tomography angiography at 1 and 12 months after EVAR, and subsequently, duplex ultrasound imaging or computed tomography angiography at regular intervals. Patients with ruptured aneurysms or with earlier abdominal aortic surgery were excluded. The incidence and clinical outcome of endograft occlusions were analyzed. An expert review board assessed all cases in the search for possible causes of occlusion. RESULTS: Included were 496 patients (87.7% male), who were a median age of 74 years (range, 68-78 years). Median follow-up was 1.7 years (range, 0-4.6 years). Twenty graft occlusions (4.0%) occurred during follow-up. Median time between primary EVAR and detection of the occlusion was 1 month, with 55% occurring ≤ 60 postoperative days and 90% ≤ 1 year. No association was found between occlusion and sex (P = .28), age (P = .96), or use of an aortouniiliac device (P = .66). Technical error was the considered cause of the occlusion in 12 patients (60%). The estimated freedom from occlusion was 98.4% at 30 days, 95.7% at 1 year, and 95.3% at 3 years. Presenting symptoms of occlusion were acute limb ischemia in 50%. Treatment was surgical (75%) or percutaneous (25%). Successful revascularization was achieved in 17 of 20 patients, but reocclusions occurred in five, resulting in a transfemoral amputation in one patient. Occlusion-related mortality was 0.6% (3 of 496). CONCLUSIONS: A median follow-up of 1.7 years, Endurant endograft occlusion occurred in 4.0% of 496 patients. Most occlusions occurred ≤ 2 months after EVAR, and rarely after 1 year. A technical justification for occlusion could be found for 60% of patients. A more liberal intraoperative and early postoperative (re)intervention strategy may reduce the occlusion rates and improve outcome.


Authors: Kadoya, Yoshito; Kenzaka, Tsuneaki; Naito, Daisuke

Source: SpringerPlus; 2016; vol. 5 (no. 1); p. 782

Abstract

OBJECTIVE: The Endurant endograft (Medtronic Inc, Minneapolis, Minn) is a new-generation device specifically developed to perform well in complex abdominal aortic aneurysm anatomy. Previous reports on the 1- and 2-year results of endovascular aneurysm repair (EVAR) with the Endurant endograft showed excellent outcome, including prevention of migration and type I endoleaks, but occurrence and outcome of post-EVAR occlusion have not been determined in a large multicenter patient cohort with midterm follow-up, which is the objective of this study. METHODS: All patients presenting with endograft limb occlusion after elective EVAR between January 2010 and June 2013, along with age, sex, and type of endograft matched controls were included in the study. The impact of atherosclerotic risk factors, anatomic characteristics of the aneurysm, procedural details, and antiplatelet therapy was investigated. Multivariate logistic regression analysis and conditional logistic regression analysis for 1:3 matched pairs deriving adjusted odds ratios (ORs) with 95% confidence intervals (CIs) in order to detect significant risk factors for endograft limb occlusion among cases and controls were modeled. RESULTS: Of the 439 patients treated by EVAR, 18 patients (4.1%) presented with endograft limb occlusion. These patients were compared to 54 matched controls. Limb occlusion was associated with iliac artery angulation ≥ 60° (OR = 5.76, 95% CI = 1.24-26.74; p = .03) or perimeter calcification ≥ 50% (OR = 5.87, 95% CI = 1.10-31.32; p = .04). Limb occlusion was also associated with ≥ 15% endograft oversizing in the common iliac artery (OR = 5.54, 95% CI = 1.11-27.60; p = .04). No other risk factors for limb occlusion were recognized. CONCLUSIONS: The presence of significant angulation and calcification of the iliac arteries as well as excessive limb oversizing appear to be independent predictors of endograft limb occlusion after EVAR.
INTRODUCTION
Limb occlusion after endovascular aneurysm repair (EVAR) is a well-known complication. However, extensive ischemic ulcers due to limb occlusion are extremely rare. CASE DESCRIPTION
We report a rare case of extensive ischemic ulcers that developed seven months after EVAR in an 85-year-old Japanese man. He had been taking appropriate anticoagulant therapy because of paroxysmal atrial fibrillation. Angiography showed a left limb occlusion and superficial femoral artery (SFA) chronic total occlusion (CTO), and intravascular ultrasound showed limb kinking. Endovascular therapy (EVT) was performed, and stent placement was used to cover a large amount of thrombi and correct the limb kinking, leading to complete recovery of left limb blood flow. After additional EVT was performed for the SFA CTO, outflow improved and the ulcers healed completely.

DISCUSSION AND EVALUATION
It seemed that the combination of poor inflow and poor outflow led to limb thrombosis.

CONCLUSIONS
Here, we describe an extremely rare case of extensive ischemic ulcers due to limb occlusion after EVAR. Patients should undergo careful follow-up after EVAR to monitor blood flow to the lower extremities. Additionally, the early detection and correction of limb kinking and poor outflow are essential to prevent the development of ischemic ulcers.

17. Adjunctive iliac stents reduce the risk of stent-graft limb occlusion following endovascular aneurysm repair with the Zenith stent-graft.

Authors
Oshin, Olufemi A; Fisher, Robert K; Williams, Leith A; Brennan, John A; Gilling-Smith, Geoffrey L; Vallabhaneni, S Rao; McWilliams, Richard G

Source
Journal of endovascular therapy : an official journal of the International Society of Endovascular Specialists; Feb 2010; vol. 17 (no. 1); p. 108-114

Abstract
PURPOSE
To determine whether the introduction of a policy of adjunctive stent insertion based on preoperative CT assessment or completion angiography reduced the incidence of limb occlusion after stent-graft implantation for endovascular aneurysm repair (EVAR). METHODS
A tertiary referral unit's endovascular database was retrospectively interrogated to compare the incidence of endograft limb occlusion in Zenith grafts following the introduction of a policy of selective adjunctive stent insertion. Group A included 288 limbs at risk in 146 patients (134 men; mean age 74+/8 years) treated prior to August 2005 in whom adjunctive stents were inserted on an ad hoc basis only. Group B included 293 limbs at risk in 149 patients (134 men; mean age 76+/7 years) treated after this date in whom a more aggressive adjunctive stenting strategy was adopted. Kaplan-Meier analysis was employed to compare outcomes. RESULTS
In total, 295 patients underwent EVAR involving 581 iliac vessels, of which 11 (1.8%) occluded at a median of 24 months (0-27). Of 65 limbs extended into the external iliac segment, 5 (7.6%) subsequently occluded; in the remaining 516 limbs, there were 6 (1.1%) occlusions (p = 0.004). Across the study group, 38 (6.5%) adjunctive stents were deployed in limbs deemed at risk; 1 (2.6%) of these occluded. In the remaining 543 unstented limbs, 10 (1.8%) occlusions occurred (p = 0.15). There were 11 occlusions in group A, in which 5 (1.7%) adjunctive stents had been deployed, but none in group B, which had received 33 (11.2%) stents (p<0.0001). Kaplan-Meier survival curves identified primary patency rates at 36 months of 96% and 100%, respectively (p = 0.001). CONCLUSION
Adjunctive stenting significantly reduces the risk of postoperative stent-graft limb occlusion without obvious compromise to the aneurysm repair.


Authors
Hanley, Stephen C; Neequaye, Simon K; Steinmetz, Oren; Obrand, Daniel; Mackenzie, Kent; Abraham, Cherrie Z

Source
Journal of vascular surgery; Sep 2015; vol. 62 (no. 3); p. 762-766

Abstract
Complex aortic aneurysms are now being repaired by endovascular techniques, albeit with a potentially increased risk of lower limb ischemia-reperfusion injury. We report a simple technique to maintain perfusion to the lower limb during endovascular repair, using one additional introducer sheath placed antegrade, distal to the stent graft introduction site, and connected to the side arm of the working sheath in the contralateral artery. This allows continuous perfusion of the limb distal to the main stent graft introduction site. In our initial experience with 12 cases, with confirmed occlusion of the native arterial system by the stent graft introducer sheath, arterial occlusion time was 165 ± 84 minutes. Use of the sheath-shunt technique resulted in pulsatile flow in all cases, with an average flow of 42.2 ± 13.2 mL/min, and actual ischemia time was reduced to 14 ± 11 minutes. There were no complications related to the use of this technique. Given the limited risk of this technique coupled with a potential benefit, we propose its consideration in patients undergoing complex endovascular repair.

Authors: Thompson, M M; Smith, J L; Bell, P R

Source: Seminars in vascular surgery; Sep 1999; vol. 12 (no. 3); p. 215-219

Publication Date: Sep 1999

Publication Type(s): Research Support, Non-u.s. Gov't Journal Article

Database: Medline

Abstract: Thromboembolic complications are relatively uncommon after conventional aneurysm surgery but have been reported in many early series of endovascular aneurysm repair. This article reviews the clinical evidence for embolization during endoluminal procedures and presents an ultrasound-based method to detect lower limb embolization during aneurysm repair. The results of a comparative clinical trial are presented that demonstrated a higher incidence of particulate embolization during endovascular as compared with conventional aneurysm surgery. The implications of this finding for clinical practice are discussed.

20. Regarding "Endograft limb occlusion and stenosis after ANCURE endovascular abdominal aneurysm repair".

Authors: Kasirajan, K; Matteson, B; Marek, J; Langsfeld, M

Source: Journal of vascular surgery; Oct 2002; vol. 36 (no. 4); p. 869

Publication Date: Oct 2002

Publication Type(s): Letter Comment

Database: Medline

Available in full text at Journal of Vascular Surgery from Free Access Content

Available in print at North Manchester Hospital Library from JOURNAL OF VASCULAR SURGERY

Available in print at Royal Oldham Hospital Library from JOURNAL OF VASCULAR SURGERY


Authors: Cochenue, F; Becquemin, J P; Desgranges, P; Allaire, E; Kobeiter, H; Roudot-Thoraval, F

Source: European journal of vascular and endovascular surgery : the official journal of the European Society for Vascular Surgery; Jul 2007; vol. 34 (no. 1); p. 59-65

Publication Date: Jul 2007

Publication Type(s): Journal Article

Database: Medline

Available in full text at European Journal of Vascular and Endovascular Surgery from Elsevier

Abstract: INTRODUCTION We reviewed our experience with limb occlusion after EVAR in order (1) to assess the clinical pattern and treatment options (2) to assess outcomes and (3) to identify predictive factors of occurrence. MATERIALS AND METHOD Between 1995 and 2005, 460 AAA patients were electively treated with a variety of commercially available stent grafts. There were 369 bifurcated and 91 aortouniliac grafts (829 limbs). Follow-up included physical examination, plain X-ray, Duplex ultrasonography, and spiral computed tomographic scans at 1, 6, 12 months and annually thereafter. All pertinent data were collected prospectively and analysed retrospectively. The follow-up period ranged from Day 0 to 104 months, with a median follow-up of 23.4 months. RESULTS 336 limbs in 33 patients (7.2%) occluded between Day 0 and 71 months (average: 9.5 months) after EVAR. Presentation was acute ischemia in 11 cases, rest pain in 9, claudication in ten. Four occlusions remained asymptomatic and two occurred intraoperatively. Treatment was femoro-femoral cross-over graft in 19 cases, axillo-femoral bypass in three, thrombectomy and stent in three, thrombolysis and stent in nine, and conservative in two. One patient (3%) died of multiple organ failure after thrombolysis. There was no amputation. Reclosures occurred in two patients (6.1%). Multivariate logistic regression showed that kinking (odds ratio [OR] 11.9; confidence interval [CI] 3.39-42.1; p=0.0001), first graft generation (OR 2.87; CI 1.25-6.62; p=0.017) and younger age (OR 1.05; CI 1.00-1.09; p=0.034) were independently related to the occurrence of graft limb occlusion. CONCLUSION A acute graft limb occlusion is not rare after EVAR. The frequency of limb occlusion has declined with current stent grafts generation. Although surgery and endovascular treatments are efficient and safe, development of a graft limb kink should lead to aggressive preemptive treatment to prevent occlusion.

22. Self expandable stent application to prevent limb occlusion in external iliac artery during endovascular aneurysm repair.

Authors: Lee, J Hoon; Park, K Hyuk

Source: Annals of surgical treatment and research; Sep 2016; vol. 91 (no. 3); p. 139-144

Publication Date: Sep 2016

Publication Type(s): Journal Article

Database: Medline

Available in full text at Annals of Surgical Treatment and Research from National Library of Medicine

Available in full text at Annals of Surgical Treatment and Research from National Library of Medicine

Available in full text at Annals of Surgical Treatment and Research from National Library of Medicine
PURPOSE: Iliac extension of stent-graft during endovascular aneurysm repair (EVAR) increases the incidence of limb occlusion (LO). Hypothetically, adjunctive iliac stent (AIS) could offer some additional protection to overcome this anatomic hostility. But still there is no consensus in terms of effective stent characteristics or configuration. We retrospectively reviewed our center's experience to offer a possible answer to this question.

METHODS: Our study included 30 patients (38 limbs) with AIS placed in the external iliac artery (EIA) from January 2010 to December 2013. We classified iliac tortuosity based on anatomic characteristics. AIS's were deployed in EIA with a minimum 5-mm stick-out configuration from the distal edge of the stent-graft.

RESULTS: According to the iliac artery tortuosity index, grade 0, grade 1, and grade 2 were 5 (13.2%), 30 (78.9%), and 3 (7.9%), respectively. The diameter of all AIS was 12 mm, which was as large as or larger than the diameter of the stent-graft distal limb. SMART stents were preferred in 34 limbs (89.5%) and stents with 60-mm length were usually used (89.5%). During a mean follow-up of 9.13 ± 10.78 months, ischemic limb pain, which could be the sign of LO, was not noticed in any patients. There was no fracture, kinking, migration, in-stent restenosis, or occlusion of AIS.

CONCLUSION: The installation of AIS after extension of stent-graft to EIA reduced the risk of LO without any complications. AIS should be considered as a preventive procedure of LO if stent-graft needs to be extended to EIA during EVAR.

23. Occlusion of the common and internal iliac arteries for aortoiliac aneurysm repair: experience with the Amplatzer vascular plug.

Authors: Grenon, S Marlene; Gagnon, Joel; Hsiang, York; Sidhu, Ravi; Taylor, David; Clement, Jason; Chen, Jerry
Source: Canadian journal of surgery. Journal canadien de chirurgie; Dec 2009; vol. 52 (no. 6); p. E276
Publication Date: Dec 2009
Publication Type(s): Journal Article
Database: Medline

BACKGROUND: We sought to evaluate and describe our centre's experience with the Amplatzer vascular plug (AVP) for the occlusion of common and internal iliac arteries (CIA; IIA) during endovascular aortic aneurysm repair (EVAR).

METHODS: We performed a retrospective analysis of 20 consecutive patients between October 2006 and December 2007, who underwent occlusion of the CIA or IIA before or during EVAR to prevent endoleak.

RESULTS: Among these 20 patients, 21 occlusion procedures occurred and 20 were successful. In the only unsuccessful case, the patient had EVAR, but occlusion with an AVP was not possible because of severe narrowing at the origin of the vessel. Of the successfully treated patients, 2 presented with ruptured aneurysms, whereas the others had elective procedures. Eleven patients received aortouni-iliac grafts and femoral-femoral bypass, and 9 patients received a bifurcated stent graft. In 5 patients, the AVP occlusion and EVAR procedures were staged; in these cases occlusion occurred first, followed by EVAR on average 29 (standard deviation [SD] 23) days later. We deployed 7 AVPs in the CIA, whereas 13 were deployed in the IIA. The average diameter of the vessels occluded was 10 (SD 1) mm and the average size of the device used was 13 (SD 1) mm, representing a device diameter 28% (SD 2%) greater than the vessel diameter. We used a single device in 18 patients, whereas 2 devices were deployed in the same artery in 2 patients. Four patients underwent concomitant coil embolization. On follow-up computed tomography (CT) scans, all occlusion procedures were clinically successful. At the 14-month (SD 1 mo) follow-up, 4 patients had a small type-ll endoleak unrelated to the occlusion procedure and 1 had a type-ll endoleak that required graft limb extension. Four patients had buttock claudication but none had changes in sexual function, ischemic complications or device dislodgement on CT scans.

CONCLUSION: The AVP is a safe and effective method to occlude the CIA and IIA in patients undergoing EVAR.

24. Management of acute type B aortic dissections and acute limb ischemia.

Authors: Khoynezhad, A; Rao, R; Trento, A; Gewertz, B
Source: The Journal of cardiovascular surgery; Aug 2011; vol. 52 (no. 4); p. 507-517
Publication Date: Aug 2011
Publication Type(s): Journal Article Review
Database: Medline

Authors: Usai, Marco V; Torsello, Giovanni; Donas, Konstantinos P
Source: Journal of endovascular therapy : an official journal of the International Society of Endovascular Specialists; Jun 2015; vol. 22 (no. 3); p. 396-400

Abstract

PURPOSE To review the literature on pararenal endovascular aneurysm repair (EVAR) to determine the frequency and clinical relevance of chimney graft occlusions. METHODS A comprehensive search of the English-language literature abstracted in the Medline and the Cochrane Library databases was performed to identify case series involving pararenal aortic pathologies (degenerative aneurysms, penetrating atherosclerotic ulcers, type Ia endoleaks, and para-anastomotic aneurysms) treated with EVAR and chimney grafts; thoracoabdominal, iliac, or aortic arch chimney graft placements were excluded, as were case reports in which the total number of chimney grafts implanted at the reporting center could not be determined. The literature search identified 83 studies regarding chimneys/snorkels for pararenal pathologies published between January 2007 and March 2014. Of these, 7 studies met the inclusion criteria and were included in the analysis. RESULTS There were 15 (4.5%) occlusions in the overall 334 renovisceral vessels in which chimney grafts were deployed. The mean time to chimney graft occlusion was 3.5 months (range 1-270 days) over a mean follow-up of 1.4 months (range 9-24). The target arteries were the renal artery (n=12) and the superior mesenteric artery (SMA; n=3). Seven patients were asymptomatic, and no description was given in 5 cases. In the other 3 patients, the symptoms were acute renal failure, intestinal ischemia, and malignant hypertension. The treatment strategy included open conversion and iliorenal bypass (n=1), exploratory laparotomy to revascularize the SMA (n=1), hemodialysis (n=1), placement of bare metal stents (n=4), conservative treatment (n=2), and unknown (n=6). One (6.7%) patient died (an occluded SMA). Two patients with renal chimney occlusion suffered from temporary renal function deterioration. CONCLUSION The present analysis identified a low rate of chimney graft occlusions, which appear to occur generally a few months after placement. Involvement of the renal artery had no severe clinical consequences, while occlusion of the SMA can be associated with life-threatening complications. More detailed information regarding occluded chimney grafts will be needed in future publications to help identify the causes.

26. Strategies that minimize the risk of iliac limb occlusion after EVAR.

Authors: Wu, Michael S H; Boyle, Jonathan R
Source: Journal of endovascular therapy : an official journal of the International Society of Endovascular Specialists; Feb 2012; vol. 19 (no. 1); p. 86-87

Abstract

AIM The aim of this study was to review the management of acute type B aortic dissection (TBAD) with acute limb ischemia. A search using the “PubMed” resulted in 254 records by combining the Medical Subject Heading keywords (listed separately). The articles were assessed for their validity, correct pathology and patient cohort. Inclusion criteria included all patients with complicated acute TBAD who were candidates for open thoracic endovascular aortic repair (TEVAR). The exclusion criteria included type A, asymptomatic acute or chronic TBAD, penetrating ulcer or intramural hematoma. TBAD with limb ischemia has a poor prognosis if not diagnosed, triaged and treated promptly. Clinical presentation and diagnostic strategy as well as various imaging are reviewed. Early mortality rate for complicated acute TBAD (with malperfusion to lower extremity) is 12%. The management has moved from open operation to primary TEVAR. In cases with anatomic obstruction, open surgical techniques such as femoral-femoral bypass, axillo-femoral bypass or surgical fenestration can be successful in relief of malperfusion to the affected limb. One-year survival rates are 85%. A complete to partial reverse aortic remodeling occurred in 78% of survivors of acute TBAD, if primary TEVAR is applied. Acute TBAD with limb ischemia remains a clinical challenge that requires prompt diagnosis and treatment. TEVAR of acute TBAD is associated with relatively low morbidity and mortality, and is more often used as primary approach for patients with limb ischemia. The outcomes with TEVAR compare favorably to the open repair, and initiate reverse aortic remodeling in majority of the survivors.

27. [Lower body ischemia due to bending of the stent after hybrid treatment for chronic stansford type B aortic dissection].

Authors: Nakao, Mitsutaka; Yamashiro, Masahito; Matsumura, Yoko; Yoshitake, Michio; Tanaka, Kei; Sakamoto, Yoshimasa; Hashimoto, Kazuhiro
Source: Kyobu geka. The Japanese journal of thoracic surgery; Aug 2013; vol. 66 (no. 9); p. 791-794
Lower body ischemia due to bending of a stented graft at the thoracic aorta was rare, particularly when it occurred in several days after surgery. We experienced this complication and performed the 3rd-time thoracic endovascular repair (TEVAR). A 49-year-old man with a chronic aortic dissection of Stanford type B underwent TEVAR; however, we failed to close the entry because of the tortuously bended distal arch of the aorta. Then it was decided the patient undergo a hybrid treatment with arch replacement and frozen elephant trunk. Seventeen days after the surgery, the blood pressure of the patient’s lower limb was reduced rapidly and his renal function deteriorated. Bending of the stent was revealed by computed tomography (CT). The patient underwent the 3rd-time emergency TEVAR, and his symptoms improved.

28. Response to letter to the editor: 'Re: Endograft limb occlusion in EVAR: iliac tortuosity quantified by three different indices on the basis of pre-operative CTA.'
Authors: Taudorf, M; Schroeder, T V; Lönn, L
Source: European journal of vascular and endovascular surgery: the official journal of the European Society for Vascular Surgery; Dec 2014; vol. 48 (no. 6); p. 712
Publication Date: Dec 2014
Publication Type(s): Letter Comment
Database: Medline
Available in full text at European Journal of Vascular and Endovascular Surgery from Elsevier

29. Commentary on: "endograft limb occlusion in EVAR: iliac tortuosity quantified by three different indices on the basis of preoperative CTA".
Authors: Rancic, Z
Source: European journal of vascular and endovascular surgery: the official journal of the European Society for Vascular Surgery; Nov 2014; vol. 48 (no. 5); p. 534-535
Publication Date: Nov 2014
Publication Type(s): Journal Article Comment
Database: Medline
Available in full text at European Journal of Vascular and Endovascular Surgery from Elsevier

30. Re. 'Endograft limb occlusion in EVAR: iliac tortuosity quantified by three different indices on the basis of pre-operative CTA'.
Authors: Lau, Y-F; Senaratne, J; Ghatwary, T
Source: European journal of vascular and endovascular surgery: the official journal of the European Society for Vascular Surgery; Dec 2014; vol. 48 (no. 6); p. 711-712
Publication Date: Dec 2014
Publication Type(s): Letter Comment
Database: Medline
Available in full text at European Journal of Vascular and Endovascular Surgery from Elsevier

31. Successful endovascular repair in two cases of graft limb occlusion after endovascular aneurysm repair for abdominal aortic aneurysms.
Authors: Hoshina, Katsuyuki; Kato, Masaaki; Mikuriya, Akiyoshi; Ohkubo, Nobukazu
Source: Surgery today; May 2010; vol. 40 (no. 5); p. 487-490
Publication Date: May 2010
Publication Type(s): Case Reports Journal Article
Database: Medline
Available in full text at Surgery Today from EBSCOhost
Abstract:
Among 148 abdominal aortic aneurysm patients who underwent endovascular aneurysm repair at our institution, two cases of graft limb occlusion (GLO) were identified and successfully treated with endovascular repair. Guidewire cannulation against the occluded limb is the most important aspect of the procedure. After a thrombectomy, balloon dilatation is performed followed by stent-graft deployment. Various procedures such as thrombectomy, thrombolysis, and extra-anatomical bypass have been adopted for the treatment of GLO. Our use of endovascular techniques, including overlapping stent grafts, has some benefits, namely, better patency of anatomical route revascularization, decreased risk of ipsilateral shower embolization due to the stent graft’s sealing over the irregular remnant thrombus, and easy access to angioplasty for tortured iliac arteries. However, shower embolization during catheter handling or future fabric failure due to friction is the potential complication associated with endovascular techniques. Intravascular repair techniques and stent graft use should therefore be an early step of the GLO treatment algorithm.

**Authors**
Sivamurthy, Nayan; Schneider, Darren B; Reilly, Linda M; Rapp, Joseph H; Skovobogatyy, Herman; Chuter, Timothy A M

**Source**
Journal of vascular surgery; Apr 2006; vol. 43 (no. 4); p. 662-670

**Publication Date**
Apr 2006

**Publication Type(s)**
Research Support, Non-u.s. Gov't Comparative Study Journal Article

**Database**
Medline

**Available in full text at**
Journal of Vascular Surgery from Free Access Content

**Abstract**
OBJECTIVE Endograft limb occlusion is an infrequent but serious complication of endovascular abdominal aortic aneurysm (AAA) repair. The insertion of additional stents within the endograft limb may prevent future occlusion. This study evaluates limb patency with and without adjunctive stenting of endograft limbs at the time of endovascular AAA repair.

**METHODS** We performed a retrospective review of 248 patients who underwent endovascular abdominal aortic aneurysm repair with the Zenith AAA endovascular graft between 1999 and 2004. Among these patients, two groups were identified: 64 patients with adjunctive stents placed in 85 limbs and 184 patients without additional bare stent placement in endograft limbs at the time of endovascular AAA repair.

**RESULTS** Women comprised 23% of stented and 11% of unstented patients ($P = .02$). The mean length of follow-up in the stented and unstented groups was 2.0 years. There were 13 instances of limb thrombosis in 13 patients (5.2% of patients, 2.7% of limbs), all in the unstented group. No limb occlusions occurred in the presence of adjunctive bare metal stents. Seventy-three percent of the occlusions occurred $\leq$ 6 months of endovascular AAA repair. Two patients (15%) had no symptoms of lower-extremity ischemia despite graft limb occlusion and did not undergo intervention. The others underwent thrombectomy ($n = 2$), thrombectomy with bare stent placement ($n = 3$), femoral-femoral bypass ($n = 4$), thrombolysis ($n = 1$), and thrombolysis with bare stent placement ($n = 1$). Of the seven who underwent thrombectomy or thrombolysis, three had no additional stents placed at the secondary procedure, and two of these three went on to rethrombose. By life-table analysis, primary patency at 3 years in the stented and nonstented limbs was 100% +/- 0% and 94% +/- 3%, respectively ($P = .05$).

**CONCLUSIONS** The intraoperative insertion of additional bare metal stents appeared to eliminate the risk of thrombosis and was without complication. Of the 85 stented limbs in this series, not one occluded. The overall rate of limb thrombosis was low, with most limb occlusions occurring $\leq$ 6 months of stent-graft insertion, and would probably have been even lower had we been able to identify all high-risk cases for prophylactic adjunctive stenting. Limb occlusion denotes an underlying problem with the graft, which if left untreated after thrombectomy or thrombolysis will lead to rethrombosis. Postoperative imaging was of little value in detecting impending limb occlusion. Based on these findings, we believe one should identify and stent any limbs that appear to be at risk for thrombosis, but this study lacks the data to predict which limbs need stenting.

33. Successful Endovascular Management of Intraoperative Graft Limb Occlusion and Iliac Artery Rupture Occurred during Endovascular Abdominal Aortic Aneurysm Repair.

**Authors**
Lim, Jae Hong; Sung, Yong Won; Oh, Se Jin; Moon, Hyeon Jong; Lee, Jeong Sang; Choi, Jae-Sung

**Source**
The Korean journal of thoracic and cardiovascular surgery; Feb 2014; vol. 47 (no. 1); p. 71-74

**Publication Date**
Feb 2014

**Publication Type(s)**
Journal Article

**Database**
Medline

**Available in full text at**
The Korean Journal of Thoracic and Cardiovascular Surgery, The from National Library of Medicine

**Abstract**
For high-risk patients, endovascular aortic aneurysm repair (EVAR) is a good option but may lead to serious complications, which should be addressed immediately. A 75-year-old man with a history of abdominal surgery underwent EVAR for an aneurysm of the abdominal aorta and iliac arteries. During EVAR, iliac artery rupture and graft limb occlusion occurred, and they were successfully managed by the additional deployment of an iliac stent graft and balloon thrombectomy, respectively. We, herein, report a rare case of the simultaneous development of the two fatal complications treated by the endovascular technique.

34. Type B aortic dissection after endovascular abdominal aortic aneurysm repair causing endograft collapse and severe malperfusion.

**Authors**
Iyer, Vikram; Rigby, Mark; Vrabec, George

**Source**
Journal of vascular surgery; Aug 2009; vol. 50 (no. 2); p. 413-416

**Publication Date**
Aug 2009

**Publication Type(s)**
Case Reports Journal Article

**Database**
Medline
Abstract
We report a unique case of type B aortic dissection occurring 11 weeks after endovascular repair of an abdominal aortic aneurysm. This resulted in severe organ and limb malperfusion with collapse and occlusion of the endograft. Successful endovascular salvage is described along with a brief review of the literature.

35. Ischemic complications after endovascular abdominal aortic aneurysm repair.

Authors
Maldonado, Thomas S; Rockman, Caron B; Riles, Eric; Douglas, Diah; Adelman, Mark A; Jacobowitz, Glenn R; Gagne, Paul J; Nalbandian, Matthew N; Cayne, Neal S; Lamparello, Patrick J; Salzberg, Stephanie S; Riles, Thomas S

Source
Journal of vascular surgery; Oct 2004; vol. 40 (no. 4); p. 703

Publication Date
Oct 2004

Publication Type(s)
Journal Article

Abstract
OBJECTIVESLimb and pelvic ischemia are known complications after endovascular abdominal aortic aneurysm repair (EVAR). The objective of this paper is to present our experience with the incidence, presentation, and management of such complications.METHODSOVer 9 years 311 patients with aortic aneurysms underwent EVAR. A retrospective review identified 28 patients (9.0%) with ischemic complications.RESULTSANumber 28 patients with ischemic complications, 21 had lower extremity ischemia and 7 had pelvic ischemia: colon (n = 4), buttock (n = 2), and spinal cord (n = 2). Of the 21 patients with lower extremity ischemia, 15 had limb occlusions (71.4%), 3 due to embolization (14.7%) and 3 the result of common femoral artery thromboses (14.7%). Limb occlusions were manifested as severe acute arterial ischemia (n = 6), rest pain (n = 3), intermittent claudication (n = 5), and decreased femoral pulse (n = 1). Limb occlusions were managed with thrombectomy and stent placement (n = 4), femorofemoral bypass (n = 7), eventual explantation because of persistent endoleak (n = 1), and expectant management (n = 3). The 3 patients with occlusions managed expectantly all had intermittent claudication, which has subsequently improved. In the 6 patients with lower extremity ischemia due to embolization or common femoral artery injury presentation was acute, and embolectomy was performed, followed by femoral artery endarterectomy and patch angioplasty or placement of an interposition graft. One patient who had a prolonged postoperative course including cardiac arrest subsequently required distal bypass and ultimately above-knee amputation. Among the 7 patients with pelvic ischemia, 2 patients had unilateral hypogastric artery embolization before the original surgery. Among the patients with colon ischemia, 3 were seen immediately postoperatively, and required colectomy and colostomy. Two patients who required urgent colectomy subsequently had multiple organ failure, and died in the perioperative period. One patient had abdominal pain 1 week after surgery, which was managed with bowel rest, with subsequent improvement. In 2 patients spinal cord ischemia developed immediately after surgery, which resulted in persistent paraplegia. Buttock ischemia developed in 2 patients, 1 of whom required fasciotomy because of gluteal compartment syndrome, and had transient renal failure.CONCLUSIONSIschemic complications are not uncommon after EVAR, and may exceed the incidence with open surgical repair. Limb ischemia is most often a result of limb occlusion, and can be successfully managed with standard interventions. Pelvic ischemia often results from atheroembolization despite preservation of hypogastric arterial circulation. Colonic and spinal ischemia are associated with the highest morbidity and mortality.


Authors
Brookes-Fazakerley, Steven D; Thorpe, Philippa; Chan, Colin; Jackson, Gillian E

Source
Journal of surgical case reports; Mar 2015; vol. 2015 (no. 3)

Publication Date
Mar 2015

Publication Type(s)
Journal Article

Abstract
Brookes-Fazakerley, Steven D; Thorpe, Philippa; Chan, Colin; Jackson, Gillian E

Available in full text at Journal of Vascular Surgery from Elsevier
Available in full text at Journal of Vascular Surgery from Free Access Content
Available in print at North Manchester Hospital Library from JOURNAL OF VASCULAR SURGERY
Available in full text at Journal of Vascular Surgery from Free Access Content
Available in full text at Journal of Surgical Case Reports from Oxford University Press
Available in full text at Journal of Surgical Case Reports from National Library of Medicine
Available in full text at Journal of Surgical Case Reports from Directory of Open Access Journals
Available in full text at Journal of Surgical Case Reports from Directory of Open Access Journals

Available in full text at Journal of Surgical Case Reports from Highwire Press
Available in full text at Journal of Surgical Case Reports from Directory of Open Access Journals

OBJECTIVESLimb and pelvic ischemia are known complications after endovascular abdominal aortic aneurysm repair (EVAR). The objective of this paper is to present our experience with the incidence, presentation, and management of such complications.

METHODS
Over 9 years 311 patients with aortic aneurysms underwent EVAR. A retrospective review identified 28 patients (9.0%) with ischemic complications.

RESULTS
Among 28 patients with ischemic complications, 21 had lower extremity ischemia and 7 had pelvic ischemia: colon (n = 4), buttock (n = 2), and spinal cord (n = 2). Of the 21 patients with lower extremity ischemia, 15 had limb occlusions (71.4%), 3 due to embolization (14.7%) and 3 the result of common femoral artery thromboses (14.7%). Limb occlusions were manifested as severe acute arterial ischemia (n = 6), rest pain (n = 3), intermittent claudication (n = 5), and decreased femoral pulse (n = 1). Limb occlusions were managed with thrombectomy and stent placement (n = 4), femorofemoral bypass (n = 7), eventual explantation because of persistent endoleak (n = 1), and expectant management (n = 3). The 3 patients with occlusions managed expectantly all had intermittent claudication, which has subsequently improved. In the 6 patients with lower extremity ischemia due to embolization or common femoral artery injury presentation was acute, and embolectomy was performed, followed by femoral artery endarterectomy and patch angioplasty or placement of an interposition graft. One patient who had a prolonged postoperative course including cardiac arrest subsequently required distal bypass and ultimately above-knee amputation. Among the 7 patients with pelvic ischemia, 2 patients had unilateral hypogastric artery embolization before the original surgery. Among the patients with colon ischemia, 3 were seen immediately postoperatively, and required colectomy and colostomy. Two patients who required urgent colectomy subsequently had multiple organ failure, and died in the perioperative period. One patient had abdominal pain 1 week after surgery, which was managed with bowel rest, with subsequent improvement. In 2 patients spinal cord ischemia developed immediately after surgery, which resulted in persistent paraplegia. Buttock ischemia developed in 2 patients, 1 of whom required fasciotomy because of gluteal compartment syndrome, and had transient renal failure.

CONCLUSIONS
Ischemic complications are not uncommon after EVAR, and may exceed the incidence with open surgical repair. Limb ischemia is most often a result of limb occlusion, and can be successfully managed with standard interventions. Pelvic ischemia often results from atheroembolization despite preservation of hypogastric arterial circulation. Colonic and spinal ischemia are associated with the highest morbidity and mortality.
Abstract

Total hip replacement (THR) is a common procedure to treat patients with a fractured neck of femur. Ipsilateral major vessel injury with acute lower limb ischaemia is a rare but potentially devastating complication. Contralateral acute limb ischaemia is unreported. We present the case of a contralateral, acute lower limb ischaemia following THR for a fractured neck of femur in the presence of an endovascular aortic aneurysm repair (EVAR) and femoro-femoral crossover grafts. We advise early vascular surgery consultation for patients undergoing THR with an EVAR stentgraft in situ to help minimize risks of peri- and postoperative graft occlusion and consequent acute lower limb ischaemia.

37. Limb occlusion after endovascular repair of abdominal aortic aneurysms with supported endografts.

Authors
Maleux, Geert; Koolen, Marcel; Heye, Sam; Nevelsteen, André

Source
Journal of vascular and interventional radiology : JVIR; Oct 2008; vol. 19 (no. 10); p. 1409-1412

Publication Date
Oct 2008

Publication Type(s)
Clinical Trial Journal Article

Database
Medline

Abstract
PURPOSE To assess the time period of onset, etiology, and outcomes of limb occlusion after endovascular repair of abdominal aortic aneurysms with supported endografts.

MATERIALS AND METHODS From 1998 to 2007, 288 patients underwent endovascular aneurysm repair (EVAR) to exclude an infrarenal aortic aneurysm. In the majority of patients, a Zenith stent-graft (n = 187) or Excluder stent-graft (n = 71) was implanted. Nine patients presented with limb occlusion during follow-up. All occluded stent-grafts were modular (n = 8) or aortomonoiliac (n = 1) Zenith endoprostheses. One additional patient who was previously treated with a Zenith aortomonoiliac stent-graft was referred to our institution for further treatment of stent-graft thrombosis.

RESULTSThe initial clinical presentations were acute ischemia (n = 5), buttock claudication (n = 3), and incidental findings on follow-up imaging (n = 2). Occlusion occurred within the first month after EVAR (n = 5), between the first and second month after EVAR (n = 2), 10 months after EVAR (n = 1), and 4-5 years after EVAR (n = 2). Underlying causes of occlusion were kinking of the stent-graft (n = 5), small-diameter endograft limb with extension to the external iliac artery (n = 3), and migration and dislocation of an endograft limb (n = 2). Treatment consisted of catheter-directed thrombolysis and stent placement (n = 3), surgical thrombectomy or bypass operation (n = 5), and expectant management (n = 2). Outcome of all revascularization procedures showed immediate clinical success in all patients and no late recurrent limb ischemia at a mean follow-up of 38.9 months.

CONCLUSIONS Limb occlusion of aortic stent-grafts mostly occurs shortly after EVAR and can be related to underlying kinking of the metallic skeleton, extension of the stent-graft into the external iliac artery, or migration and dislocation of an endograft limb. Satisfactory and durable clinical outcomes can be obtained after appropriate revascularization.

38. Occlusion of endovascular stent-graft for abdominal aortic aneurysm three years after surgery.

Authors
Fukunaga, Ryota; Ito, Hiroyuki; Maehara, Yoshihiko

Source
Fukuoka Igaku Zasshi = Hukuoka Acta Medica; Aug 2002; vol. 93 (no. 8); p. 161-166

Publication Date
Aug 2002

Publication Type(s)
Case Reports English Abstract Journal Article

Database
Medline

Abstract
A 79-year old man was admitted to our department with complaints of bilateral foot coldness, numbness and intermittent claudication. He underwent endovascular repair for abdominal aortic aneurysm three years before. An abdominal X-ray showed highly kinked endovascular stent-graft which indicated graft migration, and aortography showed occlusion of stent-graft and infrarenal aorta. An axillo-bifemoral bypass was performed and blood flow to the lower extremities was restored. Endovascular repair for AAA has been established worldwide as a less invasive treatment. Endovascular repair can be performed with low mortality and morbidity in the short period; however, in the long-term follow-up series, several late complications, such as late endoleaks, graft occlusion, AAA expansion, and even AAA rupture were encountered. Indication for endovascular repair for AAA still remains controversial because of these late complications; therefore, great attention must be paid for patient selection for endovascular repair.


Authors
O'Neil, Stephen; Collins, Anton; Harkin, Denis

Source
Irish journal of medical science; Sep 2012; vol. 181 (no. 3); p. 373-376

Publication Date
Sep 2012

Publication Type(s)
Case Reports Journal Article

Database
Medline

Abstract
Available in full text at Irish Journal of Medical Science from EBSCOhost
Abstract

PURPOSE This case aims to highlight the need for careful scrutiny of the distal aorta during endovascular aneurysm repair (EVAR) planning to avoid potentially avoidable graft limb occlusion. CASE REPORT We present a case of graft limb occlusion after EVAR, unresponsive to endovascular re-intervention requiring surgical extra-anatomic revascularization, due to a narrow distal aorta causing graft impingement and collapse. CONCLUSION We suggest clinicians should be aware of this potential pitfall during EVAR planning and beware the narrow distal aorta.

40. Endograft limb occlusion and stenosis after ANCURE endovascular abdominal aneurysm repair.

Authors
Parent, F Noel; Godziachvili, Vasso; Meier, George H; Parker, Frank M; Carter, Kathleen; Gayle, Robert G; Demasi, Richard J; Gregory, Roger T

Source
Journal of vascular surgery; Apr 2002; vol. 35 (no. 4); p. 686-690

Publication Date
Apr 2002

Publication Type(s)
Journal Article

Database
Medline

Available in full text at Journal of Vascular Surgery from Free Access Content
Available in print at North Manchester Hospital Library from JOURNAL OF VASCULAR SURGERY
Available in print at Royal Oldham Hospital Library from JOURNAL OF VASCULAR SURGERY

Abstract

OBJECTIVE The purpose of this study was to define the incidence and treatment of endograft limb stenosis or occlusion (endograft limb dysfunction [ELD]) in a single center with the ANCURE unsupported bifurcated or aortouniiliac endograft by using intraoperative completion angiography and postoperative color duplex ultrasound scanning (CDU). METHODS Sixty-seven endografts (58 bifurcated, 9 uniiliac) were implanted between February 1996 and July 2000. Intraoperative completion aortography was performed in every patient. Postoperative assessment of the endograft consisted of CDU and computed tomography scanning and kidney, ureter and bladder radiographs within 7 days of implantation, at 3 and 6 months after the operation, and every 6 months thereafter. RESULTS At the time of endograft implantation, widely patent normal-appearing endograft limbs were revealed by means of the initial completion angiogram in 58 of 67 patients (group 1). ELD subsequently developed in seven of these 58 patients (13.4%). The results of the completion angiogram were not normal in the remaining nine patients (group 2), leading to the deployment of a self-expanding stent within the endograft limbs. The results of subsequent angiography were normal. No ELD has occurred in any patient in group 2 to date. The primary assisted patency rate at 30 months was 88% +/- 5.2% for group 1 versus 100% +/- 0% for group 2 (P = not significant, Log-rank test). Postoperative ELD occurred in seven patients (10.4%). Endovascular graft thrombosis occurred in three patients (3 endograft limbs). In each case, an endovascular approach was attempted; however, the guidewire would not traverse the occluded endovascular graft limb. Revascularization was accomplished by means of femorofemoral bypass grafting. Endovascular graft stenosis occurred in four patients (4 endograft limbs). Three patients with bifurcated endografts and limb stenosis who had no symptoms diagnosed by means of CDU were successfully treated by means of balloon angioplasty with self-expanding stent implantation, and the endograft limbs remained patent at 3, 5, and 26 months follow-up. The remaining patient who had an aortouniiliac endograft with recurrent severe stenoses underwent endograft explantation and aortobilateral bypass grafting. The overall incidence of ELD during or after endovascular abdominal aortic aneurysm repair was 23.8% (16 of 67 patients). CONCLUSION Unsupported endografts are at risk for developing ELD. The use of stents for limb support at the time of the initial endograft implantation may prevent subsequent ELD and bears further study. Endograft limb occlusion usually presents with acute severe ischemic symptoms, and the failure of operative thrombectomy necessitates femorofemoral artery bypass grafting. Endograft limb stenosis is identified by means of CDU surveillance in the postoperative period. Prompt treatment with percutaneous transluminal angioplasty/stent yields satisfactory primary assisted patency.

Intraoperative intravenous ultrasound scanning, oblique angiograms, pressure gradients, and completion angiography may be necessary to detect and treat ELD.

41. Endovascular repair of graft limb occlusion after endovascular repair for abdominal aortic aneurysm using 0.014-inch guidewire and coronary balloon.

Authors
You, Ji Hoon; Park, Chang-Bum; Park, Hoon-Ki; Jin, Eun-Sun; Kim, Chong-Jin

Source
International journal of cardiology; Dec 2011; vol. 153 (no. 2); p. e37

Publication Date
Dec 2011

Publication Type(s)
Letter Case Reports

Database
Medline

Available in full text at International Journal of Cardiology from Elsevier

42. Endovascular graft limb occlusion.

Authors
Woody, Jonathan D; Makaroun, Michel S

Source
Seminars in vascular surgery; Dec 2004; vol. 17 (no. 4); p. 262-267

Publication Date
Dec 2004

Publication Type(s)
Comparative Study Journal Article Review

Database
Medline
Abstract

Endovascular aneurysm repair (EVAR) has undergone a tremendous evolution in the nearly 15 years since it was first described. Continual refinement of the technology and techniques associated with EVAR and the respectable short-term results of this procedure led the United States Food and Drug Administration to approve several devices for the endovascular treatment of abdominal aortic aneurysm (AAA). There has been a corresponding rapid dissemination of this technology throughout the vascular surgery community in the United States. Availability and critical analysis of mid- and long-term follow-up data on the increasing number of patients who have undergone EVAR has begun to raise questions about the long-term durability and effectiveness of EVAR. Numerous complications of EVAR are now recognized and well described in the literature. One of these is graft limb dysfunction. Graft limb occlusion occurs in a significant number of patients and it is imperative that physicians who perform EVAR have a thorough understanding of this condition. There are a variety of factors that predispose patients to development of graft limb occlusion. These factors can be classified as either anatomic or graft-related. When patients present with graft limb occlusion, endovascular treatment is usually possible and it is highly effective. Some cases require traditional surgical treatment. Prevention of graft limb occlusion is of paramount importance. It can only be achieved with an aggressive search for graft limb compromise and liberal use of angioplasty and/or stenting at the time of graft implantation.
## Search Strategy

**Strategy 169717**

<table>
<thead>
<tr>
<th>#</th>
<th>Database</th>
<th>Search term</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Medline</td>
<td>(endovascular aneurysm repair).ti,ab</td>
<td>6960</td>
</tr>
<tr>
<td>2</td>
<td>Medline</td>
<td>(endovascular aortic aneurysm repair).ti,ab</td>
<td>5776</td>
</tr>
<tr>
<td>3</td>
<td>Medline</td>
<td>(EVAR).ti,ab</td>
<td>2828</td>
</tr>
<tr>
<td>4</td>
<td>Medline</td>
<td>(Endovascular abdominal aneurysm repair).ti,ab</td>
<td>4012</td>
</tr>
<tr>
<td>5</td>
<td>Medline</td>
<td>(Endovascular abdominal aortic aneurysm repair).ti,ab</td>
<td>3865</td>
</tr>
<tr>
<td>6</td>
<td>Medline</td>
<td>(Endovascular aortic repair).ti,ab</td>
<td>8388</td>
</tr>
<tr>
<td>7</td>
<td>Medline</td>
<td>(abdominal aortic aneurysm*).ti,ab</td>
<td>17260</td>
</tr>
<tr>
<td>8</td>
<td>Medline</td>
<td>&quot;AORTIC ANEURYSM, ABDOMINAL&quot;/</td>
<td>16035</td>
</tr>
<tr>
<td>9</td>
<td>Medline</td>
<td>(1 OR 2 OR 3 OR 4 OR 5 OR 6 OR 7 OR 8)</td>
<td>26429</td>
</tr>
<tr>
<td>10</td>
<td>Medline</td>
<td>(limb isch?emia).ti,ab</td>
<td>10765</td>
</tr>
<tr>
<td>11</td>
<td>Medline</td>
<td>(limb occlusion*).ti,ab</td>
<td>3941</td>
</tr>
<tr>
<td>12</td>
<td>Medline</td>
<td>(occluded endograft limb*).ti,ab</td>
<td>20</td>
</tr>
<tr>
<td>13</td>
<td>Medline</td>
<td>&quot;BLOOD VESSEL PROSTHESIS&quot;/ae OR &quot;BLOOD VESSEL PROSTHESIS IMPLANTATION&quot;/ae</td>
<td>8442</td>
</tr>
<tr>
<td>14</td>
<td>Medline</td>
<td>&quot;GRAFT OCCLUSION, VASCULAR&quot;/</td>
<td>9447</td>
</tr>
<tr>
<td>15</td>
<td>Medline</td>
<td>ISCHEMIA/</td>
<td>46159</td>
</tr>
<tr>
<td>16</td>
<td>Medline</td>
<td>&quot;ILIAC ARTERY&quot;/</td>
<td>13014</td>
</tr>
<tr>
<td>17</td>
<td>Medline</td>
<td>(15 AND 16)</td>
<td>920</td>
</tr>
<tr>
<td>18</td>
<td>Medline</td>
<td>(10 OR 11 OR 12 OR 13 OR 14 OR 17)</td>
<td>29728</td>
</tr>
<tr>
<td>19</td>
<td>Medline</td>
<td>(9 AND 18)</td>
<td>3797</td>
</tr>
<tr>
<td>20</td>
<td>Medline</td>
<td>(1 OR 2 OR 3 OR 4 OR 5 OR 6)</td>
<td>9834</td>
</tr>
<tr>
<td>21</td>
<td>Medline</td>
<td>(18 AND 20)</td>
<td>2759</td>
</tr>
<tr>
<td>22</td>
<td>Medline</td>
<td>(10 OR 11 OR 12 OR 13 OR 14)</td>
<td>29105</td>
</tr>
<tr>
<td>23</td>
<td>Medline</td>
<td>(20 AND 22)</td>
<td>2748</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>24</td>
<td>Medline</td>
<td>23 [DT 2007-2017] [Languages English]</td>
<td>2274</td>
</tr>
<tr>
<td>26</td>
<td>Medline</td>
<td>(10 OR 11 OR 12 OR 14)</td>
<td>21834</td>
</tr>
<tr>
<td>27</td>
<td>Medline</td>
<td>(20 AND 26)</td>
<td>441</td>
</tr>
<tr>
<td>28</td>
<td>Medline</td>
<td>(20 OR 26) [DT 1990-2017]</td>
<td>28696</td>
</tr>
<tr>
<td>29</td>
<td>Medline</td>
<td>(20 AND 26)</td>
<td>441</td>
</tr>
</tbody>
</table>