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Search details

Interventions for carotid blowout.

Resources searched

NHS Evidence; TRIP Database; Cochrane Library; BNI; CINAHL; EMBASE; MEDLINE; Google Scholar

**Database search terms:** carotid adj2 (blowout* OR "blow out"); CBS; carotid; CAROTID ARTERIES; HEMORRHAGE; ARTERY RUPTURE; carotid adj2 rupture*

**Evidence search string(s):** "cartotid blowout syndrome" OR (CBS carotid) / carotid (blowout OR rupture OR "blow out")

**Google search string(s):** carotid (blowout OR rupture OR "blow out") / carotid blowout

Summary

There is quite a lot of research on interventions for carotid blowout. As you were interested in interventions, I have excluded those papers dealing with pathological, diagnostic or aetiological aspects.

Guidelines

**ENT UK**

Head and neck cancer: multidisciplinary management guidelines 2011

Everyone involved needs to be acutely aware of what is needed by way of immediate measures (e.g. pressing on the neck in the event of a “carotid blowout” or removing the clips in the event of a rapid expanding haematoma) versus the need to get to the theatre to
attend to the problem directly. Proximity to the emergency theatres and kit available on the ward should be an important consideration.

Evidence-based reviews

None found.

Published research

1. Endovascular treatment paradigm of carotid blowout syndrome: Review of 8-years experience

Author(s) Wan W.S., Lai V., Lau H.Y., Wong Y.C., Poon W.L., Tan C.B.

Citation: European Journal of Radiology, January 2013, vol./is. 82/1(95-99), 0720-048X;1872-7727 (January 2013)

Publication Date: January 2013

Abstract: Objectives: Endovascular treatment is effective in treating carotid blowout syndrome (CBS). We reviewed our experience in addressing CBS over eight years and presented an account of the treatment paradigm and management algorithm. Method: All cases of CBS from 2003 to 2010 with endovascular treatment performed in our center were reviewed. 15 CBS in 14 patients were recruited. Based on our management algorithm, treatment regimen was stratified into deconstructive or constructive methods. Their clinical presentations, angiographic features, angiographic and clinical outcomes were reviewed. Results: 10 patients were treated with deconstructive method by means of permanent vessel occlusion (PVO) and 4 patients were treated with constructive method by means of placement of covered stent (n = 3) or flow diverting device (n = 1). Immediate hemostasis was achieved in all cases. 7 (50%) patients, in whom 5 treated with PVO and 2 with covered stent, had favorable outcomes and survived at a median follow-up period of 4 months (range: 1-84 months). Conclusion: Permanent vessel occlusion remains the gold standard of treatment and tends to show a favorable long-term outcome. Off-label use of covered stent and flow-diverting device can produce satisfactory results should balloon occlusion test fail, but long-term follow up would be required for definitive assessment. 2012 Elsevier Ireland Ltd. All rights reserved.

Source: EMBASE

2. Endovascular palliation of multivessel blowout syndrome in the setting of a nonresectable neck sarcoma

Author(s) Nassiri N., Kapoor R., Qato K., Vitek J., Rosen R.J., Al Moutran H., Costantino P.D., Green R.M.

Citation: Annals of Vascular Surgery, January 2013, vol./is. 27/1(111.e5-111.e9), 0890-5096;1615-5947 (January 2013)

Publication Date: January 2013

Abstract: Carotid blowout syndrome is a rare life-threatening complication of head and neck malignancy. Current literature has focused exclusively on the carotid system and associated branches. We present a unique case of multivessel blowout in the setting of a large nonresectable neck sarcoma requiring various endovascular techniques for palliation. Annals of Vascular Surgery Inc.

Source: EMBASE


Author(s) Agid R, Simons M, Casaubon LK, Sniderman K

Citation: Interventional Neuroradiology, December 2012, vol./is. 18/4(386-90), 1591-
**Publication Date:** December 2012

**Abstract:** We present a rare case of carotid tear caused by iatrogenic erroneous insertion of a dialysis sheath into the common carotid artery (CCA). This was treated by placement of a covered stent-graft in the CCA over the puncture site. This treatment achieved hemostasis while preserving the carotid artery with good outcome. The technical details are presented and the relevant literature regarding treatment of carotid blowout syndrome is discussed. This case suggests that placement of a covered stent-graft is a good option not only for the "usual" blowout syndrome due to head and neck tumors, but also for treatment of iatrogenic injury to the carotid artery.

**Source:** Medline

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**4. Covered stents safely utilized to prevent catastrophic hemorrhage in patients with advanced head and neck malignancy**

**Author(s)** Miller T., Burns J., Farinhas J., Pasquale D., Haboosheh A., Bello J.A., Brook A.

**Citation:** Journal of NeuroInterventional Surgery, November 2012, vol./is. 4/6(426-434), 1759-8478;1759-8486 (November 2012)

**Publication Date:** November 2012

**Abstract:** Purpose: The purpose of this study was to review the use of covered stents in patients with squamous cell carcinoma of the head and neck threatening bilateral neurovascular structures. Methods: The radiology information system was searched for all patients with bilateral head and neck carcinoma treated with covered stents in the carotid vasculature from 2006 through 2009. Five patients (one woman) of mean age 60.5 years (range 45-69) were identified. All had carotid blowout syndrome after treatment for primary squamous cell carcinoma of the head and neck with subsequent tumor recurrence or metastases immediately threatening bilateral carotid vasculature. Covered stents were placed. Long-term follow-up included clinical progress, verification of stent patency and detection of tumor progression via ultrasound or contrast-enhanced CT after the first month and then every 3-6 months. All patients were maintained on antiplatelet medication after treatment. Results: Covered stents were safely deployed in all patients. Mean survival was 5 months with one outlier surviving for 3 years. There were no subsequent uncontrollable hemorrhages. Conclusion: The use of covered stents for avoidance of catastrophic hemorrhage following treatment in patients with head and neck tumors with bilaterally threatened carotid arteries was successful.

**Source:** EMBASE

Available in fulltext from Journal of NeuroInterventional surgery at Highwire Press

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**5. Delayed carotid blow-out syndrome: A new complication of chemoradiotherapy treatment in pharyngolaryngeal carcinoma**

**Author(s)** Esteller E., Leon X., De Juan M., Quer M.

**Citation:** Journal of Laryngology and Otology, November 2012, vol./is. 126/11(1189-1191), 0022-2151;1748-5460 (November 2012)

**Publication Date:** November 2012

**Abstract:** Background: Carotid blow-out syndrome is one of the most devastating complications of head and neck carcinoma. It usually occurs as a post-operative complication or when the tumour compromises the vascular axis. Methods and results: We report two patients who suffered carotid blow-out syndrome but who did not have the usual predisposing factors. Both patients had a pharyngolaryngeal carcinoma that was treated with chemoradiotherapy. Residual non-tumoural ulceration was seen along the lateral wall of the hypopharynx in both cases. This ulceration eventually reached the vascular axis, precipitating carotid rupture and death. Conclusion: Residual non-tumoural ulceration of the lateral wall of the hypopharynx after chemoradiotherapy should be considered with the utmost caution. Once persistence of the tumour is excluded, surgery is indicated to protect the vascular axis, in order to prevent carotid blow-out syndrome. 1984 JLO Limited.
6. Endovascular management of carotid blowout.

Author(s) Zussman B, Gonzalez LF, Dumont A, Tjoumakaris S, Rosenwasser R, Hasan D, Cognetti D, Axelrod R, Jabbour P

Citation: World Neurosurgery, July 2012, vol./is. 78/1-2(109-14), 1878-8750 (2012 Jul)

Publication Date: July 2012

Abstract: OBJECTIVE: To highlight pertinent aspects of emergent endovascular management of carotid rupture, or carotid blowout syndrome (CBS), an emergent, life-threatening complication of head and neck cancer and its treatments. METHODS: A retrospective chart review was conducted of all patients with carotid blowouts at the authors’ institution from 2008-2010. A systematic literature review was also performed. RESULTS: Eight patients (three women and five men) with an average age of 61 years (range 47-78 years) were reviewed. Seven patients had a positive history for squamous cell carcinoma of the neck, and five patients had active malignant disease. Carotid arterial deconstruction using liquid embolic material, coil embolization, or both achieved immediate hemostasis in every case (100%). No patients died as a result of their initial hemorrhage, but one patient had lethal hemorrhage at 1 day postoperatively. Two patients experienced nonlethal postoperative complications. At an average follow-up of 3 months (range<1-8 months), three patients were alive, three had died as a result of their underlying disease, and two had died of other causes. CONCLUSIONS: The treatment of patients with terminal malignant disease and CBS should provide maximum relief and minimize the risks of repeat surgery, morbidity, and mortality. Endovascular management of CBS with deconstructive techniques achieves immediate hemostasis and definitive treatment. The risks of intraoperative mortality and recurrent hemorrhage are low. Copyright 2012 Elsevier Inc. All rights reserved.

Source: Medline


Author(s) Oyama H, Kito A, Maki H, Hattori K, Noda T, Wada K

Citation: Nagoya Journal of Medical Science, February 2012, vol./is. 74/1-2(193-8), 0027-7622;0027-7622 (2012 Feb)

Publication Date: February 2012

Abstract: The patient had thyroid cancer and underwent subtotal thyroidectomy. Local recurrence occurred on both sides 5 years and 6 months later. The sterno-hyoid muscle and sterno-thyroid muscle were severed and the tumor around the cricoid cartilage was removed. The tumor extended into the space between the right common carotid artery and internal jugular vein and was located under the right common carotid artery and vagus nerve on the lateral side. The carotid sheath was peeled off of the carotid artery quite easily. The right common carotid artery ruptured abruptly at the distal side during this procedure. The right common carotid artery had two layers, which were very fragile, so the direct suture or repair with a graft was impossible. The carotid artery could not be trapped with ligation because the cerebral vascular supply was not examined preoperatively. This portion was repaired using the remaining carotid sheath. However, re-bleeding occurred at the proximal portion of the previous laceration spontaneously. Fibrin glue with oxidized cellulose was initially used to seal the second small hole in this lesion. The second ruptured section was repaired using the remaining sterno-thyroid and sterno-hyoid muscles. The proximal portion of the right common carotid artery was reinforced with the harvested external jugular vein. These procedures resulted in hemostasis. Three-dimensional CT angiography showed irregular stenosis just after the operation, but it recovered 11 days later. No cerebral infarction occurred after the operation and the patient’s general condition was good.

Source: Medline

**Author(s)** Rimmer, J, Giddings, C E B, Vaz, F, Brooks, J, Hopper, C

**Citation:** Journal of Laryngology & Otology, 01 February 2012, vol./is. 126/2(111-115), 00222151

**Publication Date:** 01 February 2012

**Source:** CINAHL

9. Self expandable polytetrafluoroethylene stent for carotid blowout syndrome.

**Author(s)** Tatar EC, Yildirim UM, Dundar Y, Ozdek A, Isik E, Korkmaz H

**Citation:** B-ENT, 2012, vol./is. 8/1(61-4), 1781-782X;1781-782X (2012)

**Publication Date:** 2012

**Abstract:** Carotid blowout syndrome (CBS) is an emergency complication in patients undergoing treatment for head and neck cancers. The classical management of CBS is the ligation of the common carotid artery, because suturing is not possible due to infection and necrosis of the field. In this case report, we present a patient with CBS, in whom we applied a self-expandable polytetrafluoroethylene (PTFE) stent and observed no morbidity. Endovascular stent is a life-saving technique with minimum morbidity that preserves blood flow to the brain. We believe that this method is preferable to ligation of the artery in CBS.

**Source:** Medline

10. Emergency rescue and vascular reconstruction of carotid artery rupture: A report of 6 cases

**Author(s)** Zhu M.-h., Zheng H.-l., Chen S.-c., Chen D.-h.

**Citation:** Academic Journal of Second Military Medical University, 2012, vol./is. 33/7(738-741), 0258-879X (2012)

**Publication Date:** 2012

**Abstract:** Objective To summarize our experience in rescuing fatal bleeding induced by carotid artery rupture(CAR) and in asascular reconstruction. Methods Six patients (11 times) with CAR-induced fatal bleeding were treated in our department uring Dec. 2002 to Dec. 2008. The patients included 4 males and 2 females, with an age range of 12-67 years old and a median of 48 years old. The primary illness included vocal cord paralysis (2 cases) after operation of thyroid carcinoma, recurrent thyroid carcinoma (1 case), recurrent hypopharyngeal carcinoma (1 case), head and neck trauma (1 case) and carotid body tumor case. Four patients received radiotherapy (60-80 Gy) before second operation. One patient (2 times) had in-nominate artery blowout, 4 (8 times) had common carotid blowout, and one had internal carotid artery blowout. CAR occurred during or after surgical operations in 4 patients (8 times) and was caused by external injury in 1 case (1 time). Results Restore of CA after complete exposure of rupture was performed for 5 times, anastomosis by artificial blood vessel for 1 time, direct anastomosis for 1 time, reconstruction by great saphenous vein for 2 times, and ligation of total carotid artery for 2 times. Of all patients, 3 cases undergoing vascular reconstruction succeeded by one try, 2 by 2 tries, and 2 cases underwent ligation of artery because of suture falling off for radiotherapy of infection. Muscle flaps including pectoralis major myocutaneous flap (3 cases) and sternocleidomastoid faps (2 cases) were used to protect vascular anastomosis. All cases were successfully rescued, without perioperative death. One patient developed hemiplegia after ligation of carotid artery. All cases had complete follow-up data. One patient died due to bleeding one week after discharge, 1 died due to recurrent tumor within one year after operation. By now one patient survived for 3 years and 3 for 5 years. Conclusion Once CAP occurs, prompt press by hands and quick anti-shock procedure are the prerequisites of successful rescue. reconstruction or repair of carotid artery can prevent complications of the nervous system, and individualized vascular reconstruction trategy should be employed. Ligation of carotid is effective to rescue patients of CAR, but it should only be chosen when reconstruction is impossible.
11. Carotid blow out syndrome. endovascular management by stenting and embolization

**Author(s)** Tisnado J., Fox W., Amendola M., Sydnor M., Amendola C., Ehlenberger C.

**Citation:** Emergency Radiology, December 2011, vol./is. 18/6(467), 1070-3004 (December 2011)

**Publication Date:** December 2011

**Abstract:** Purpose: Carotid blow out syndrome (CBOS) is a catastrophic emergency associated with high morbidity and mortality (M&M). Usual causes are: head and neck malignant tumor invasion, post operative, inflammatory and trauma, among others. Conventional surgical management, including carotid artery and/or branch ligation and/or carotid artery bypass, is fraught with highM&M, may be ineffective with limited success. With the advent of covered and uncovered, balloon-expandable or self-expandable metallic stents, emergent management of CBOS has improved and currently a permanent or temporary success is expected. Materials and Methods: During the last years, we have studied 12 patients (adults, children, male, female) with CBOS of different etiologies, considered difficult or not manageable by surgery. Insertion of different types of stents, covered or uncovered, self-expanding or balloon-expandable, has been successful. We used Gore Viabahn Endoprosthesis, iCast (Atrium), Fluency Plus Stent-Graft (Bard), Wallstent and Wallgraft (Boston Scientific) and Protege (Bard). Results: All procedures were done in the IR suite and were successful in managing CBOS. No major stenting or embolization complications were found. Patients had a long or temporary survival in a relatively short followup. Conclusion: Emergent insertion is a safe, effective and easy procedure to permanently or temporarily manage CBOS. A longer follow-up and more patients treated are necessary to determine long-term role of stenting in CBOS. Surgical management may be difficult and ineffective. Placement of stents, with or without adjuvant embolization, must be considered the first choice in desperate situations.

**Source:** EMBASE


**Author(s)** Pampana E, Gandini R, Stefanini M, Fabiano S, Chiaravalloti A, Morosetti D, Spano S, Simonetti G

**Citation:** Interventional Neuroradiology, December 2011, vol./is. 17/4(490-4), 1591-0199;1591-0199 (2011 Dec)

**Publication Date:** December 2011

**Abstract:** "Carotid blowout syndrome" is defined as a hemorrhage caused by rupture of the carotid artery and its branches, and may be a severe complication of rhinopharyngeal carcinoma. This study aimed to highlight the usefulness and versatility of endovascular stent-graft placement as a rescue treatment in life-threatening carotid blowout syndrome. We describe the unconventional use of a 6 x 5 mm balloon-expandable coronaric covered stent in a patient with a diagnosis of spinocellular rhinopharyngeal carcinoma, followed by carotid blowout syndrome. Although long-term follow-up is needed to assess the eventuality of bleeding recurrence, the immediate clinical results were satisfactory.

**Source:** Medline


**Author(s)** Adachi A., Kobayashi E., Watanabe Y., Yoneyama-Sarnecky T., Hayasaka M., Suzuki H., Okamoto Y., Saeki N.

**Citation:** Japanese Journal of Neurosurgery, November 2011, vol./is. 20/8(597-603), 0917-950X (November 2011)

**Publication Date:** November 2011
**Abstract:** Background: Carotid Blowout Syndrome (CBS), or Carotid Artery Rupture (CAR), is a delayed complication with potentially fatal consequences occurring after the implementation of radiotherapy on head and neck tumors. In this report we describe two patients received endovascular treatment for severe hemorrhagic CBS developing 36 and 2 years, respectively, after radiotherapy. Both patients survived and responded positively to treatment. Methods: Case 1 was an 80-year-old woman found with minor hemorrhage near the bifurcation of the common carotid artery, 36 years after neck irradiation. She experienced frequent hemorrhagic events during the following years. Six years after the initial discovery of bleeding, she experienced massive hemorrhage, lapsed into shock, and was admitted to an Emergency Room. Connective tissue around the carotid artery was largely exposed due to neck skin defect. After hemorrhage was halted by manual compression, transient hemostasis was achieved with coil embolization of the aneurysm presumed to be the source of bleeding. Recurrent hemorrhage developed two weeks later with unraveled coil mass extrusion. Parent artery occlusion was performed by endovascular trapping, achieving permanent hemostasis. Case 2 presented massive nasal bleeding originating from the petrous segment of the internal carotid artery, 2 years after having been treated with heavy particle irradiation for olfactory neuroblastoma. Ischemic tolerance was confirmed by balloon occlusion test. Based on previous experiences, the bleeding was immediately halted by endovascular trapping. Result: Both patients were subsequently discharged, free of new neurological symptoms. Conclusion: Emergent hemostatic treatment is required in CBS developing severe hemorrhage. However, within irradiation fields, temporal embolization devices hardly lead to complete resolution. This is due to the deteriorated condition of the vascular wall incapable to enduring the expansion power of coils, stents or balloons. Bypass grafting is also difficult, due to the fragile surrounding tissue. Although, the application of sufficiently-long covered stents is anticipated in the future, parent artery embolization is often required to save the patient’s life even when the occlusion test is impossible. In such cases, endovascular trapping out of irradiation fields is the most reliable and efficacious treatment for achieving permanent hemostasis.

**Source:** EMBASE

14. Two cases of emergent endovascular treatment for carotid blowout syndrome after free flap reconstruction for neck cancer.

**Author(s)** Fujioka M, Takahata H

**Citation:** Journal of Cranio-Maxillo-Facial Surgery, July 2011, vol./is. 39/5(372-5), 1010-5182;1878-4119 (2011 Jul)

**Publication Date:** July 2011

**Abstract:** Carotid blowout is a devastating complication in patients with head and neck malignancy, and is associated with high morbidity and mortality. For patients with bleeding originating in the internal or common carotid artery, treatment options are limited. These include the endovascular remodelling strategies using a stent or embolization of the aneurysm with coils. We describe two cases of pseudoaneurysmal rupture in the common carotid artery with massive bleeding in patients with head and neck malignancies and a history of long-term radiation treatment. They underwent immediate coil embolization and wall stent deployment and, which resulted in the successful control of bleeding. Although these endovascular treatments often result in recurrent carotid blowout syndrome, they can be useful and effective in treating emergent carotid rupture in patients for whom balloon occlusion test is contraindicated. Copyright 2010 European Association for Cranio-Maxillo-Facial Surgery. Published by Elsevier Ltd. All rights reserved.

**Source:** Medline

15. Amplatzer vascular plug for occlusion of parent artery in carotid blowout with active extravasation.

**Author(s)** Shankar JJ, Maloney WJ, Vandorpe R

**Citation:** Interventional Neuroradiology, June 2011, vol./is. 17/2(224-7), 1591-0199;1591-0199 (2011 Jun)

**Publication Date:** June 2011
Abstract: Carotid blowout is a devastating complication in patients with head and neck malignancy. Various treatments including high risk surgery, carotid stenting or carotid occlusion using either coils or detachable balloons have been described. The key for any treatment is the rapidity at which it can be performed. We describe treatment of common carotid blowout secondary to neoplastic infiltration using four Amplatzer vascular plugs deployed in less than ten minutes.

Source: Medline

16. The use of a covered stent in carotid blowout syndrome.

Author(s) McGettigan B, Parkes W, Gonsalves C, Eschelman D, Keane W, Boon MS

Citation: Ear, Nose, & Throat Journal, April 2011, vol./is. 90/4(E17), 0145-5613;1942-7522 (2011 Apr)

Publication Date: April 2011

Abstract: Rupture of the extracranial carotid arteries or their major branches is known as carotid blowout syndrome (CBS). CBS is a well-recognized complication of cancer of the head and neck and subsequent radiation therapy. A few treatment modalities are available, including open ligation and different endovascular techniques, but questions regarding both the immediate and delayed complications of these procedures persist. In this case report, we describe the management of acute CBS in a 54-year-old man who had previously been treated for follicular thyroid carcinoma. The patient was hemorrhaging from a pseudoaneurysm of the left common carotid artery. A self-expanding polytetrafluoroethylene (Teflon)-covered stent was successfully deployed endovascularly, and this resulted in cessation of the bleeding and restoration of flow through the vessel. We examine the covered-stent approach to treating acute CBS, and we discuss other treatment approaches that have been described in the literature.

Source: Medline

Available in fulltext from ENT: Ear, Nose and Throat Journal at EBSCOhost


Author(s) Shah H, Gemmete JJ, Chaudhary N, Pandey AS, Ansari SA

Citation: Ajnr: American Journal of Neuroradiology, April 2011, vol./is. 32/4(743-7), 0195-6108;1936-959X (2011 Apr)

Publication Date: April 2011

Abstract: BACKGROUND AND PURPOSE: CSP in patients with HNC presenting with CBS can provide immediate hemostasis to prevent exsanguination. We evaluated the safety and efficacy of CSP to control acute life-threatening hemorrhage in patients with HNC presenting with CBS. MATERIALS AND METHODS: We retrospectively reviewed 10 patients (7 men, 3 women; mean age, 59 years) with HNC presenting with acute life-threatening hemorrhage from CBS that was treated with CSP. We studied patient demographics, presentations, procedures, initial and delayed complications, and technical and clinical outcomes on follow-up. RESULTS: All patients achieved immediate hemostasis following CSP. Periprocedural complications consisted of groin hematomas (n=2), acute limb ischemia requiring thrombectomy, and an asymptomatic temporal lobe hemorrhage. Imaging and clinical follow-up were available for a mean of 17.7 months (range, 1-60 months). Two patients remained asymptomatic with a patent stent and no evidence of rebleeding at 17 and 21 months, respectively. Recurrent hemorrhages requiring retreatment were encountered in 3 patients secondary to stent infections (30%) at mean duration of 8 months. Neurologic morbidity resulted from stent thrombosis and stroke at 8 months in a single patient. Mortality was unrelated to CSP but was a result of palliative hospice care (n=3) at a mean of 2 months or natural disease progression (n=1) with documented patency of the stent at 6 months. CONCLUSIONS: Acute life-threatening hemorrhage from CBS related to advanced HNC can be safely and effectively treated with CSP. However, potential delayed ischemic or infectious complications are common in the
exposed or infected neck.

**Source:** Medline

Available in fulltext from *American Journal of Neuroradiology* at **Highwire Press**


**Author(s)** Garcia-Egido AA, Payares-Herrera MC

**Citation:** Journal of Palliative Medicine, February 2011, vol./is. 14/2(124-5), 1557-7740;1557-7740 (2011 Feb)

**Publication Date:** February 2011

**Source:** Medline

Available in fulltext from *Journal of Palliative Medicine* at **EBSCOhost**


**Author(s)** Oweis Y, Gemmete JJ, Chaudhary N, Pandey A, Ansari S

**Citation:** Cardiovascular & Interventional Radiology, February 2011, vol./is. 34 Suppl 2/(S31-5), 0174-1551;1432-086X (2011 Feb)

**Publication Date:** February 2011

**Abstract:** We describe the delayed development of intracranial abscesses following emergent treatment with a covered stent-graft for carotid blowout syndrome (CBS) in a patient with head and neck cancer. The patient presented with hemoptysis and frank arterial bleeding through the tracheostomy site. A self-expandable stent-graft was deployed across a small pseudoaneurysm arising from the right common carotid artery (RCCA) and resulted in immediate hemostasis. Three months later, the patient suffered a recurrent hemorrhage. CT of the neck demonstrated periluminal fluid around the caudal aspect of the stent-graft with intraluminal thrombus and a small pseudoaneurysm. Subsequently, the patient underwent a balloon test occlusion study and endovascular sacrifice of the RCCA and right internal carotid artery. MRI of the brain demonstrated at least four ring-enhancing lesions within the right cerebral hemisphere consistent with intracranial abscesses that resolved with broad-spectrum antibiotic coverage.

**Source:** Medline

Available in fulltext from *CardioVascular and Interventional Radiology* at **EBSCOhost**


**Author(s)** Powitzky R, Vasan N, Krempl G, Medina J

**Citation:** Annals of Otology, Rhinology & Laryngology, 01 July 2010, vol./is. 119/7(476-484), 00034894

**Publication Date:** 01 July 2010

**Abstract:** Objectives: The objective was to review the clinicopathologic features of carotid blowout syndrome (CBS) in patients with head and neck cancer (HNC) and present a management algorithm. Methods: We reviewed all HNC patients with a diagnosis of CBS seen at our tertiary cancer hospital from 1994 to 2009 and performed a retrospective review of all English-language studies documenting CBS cases within the past 15 years. Results: Eight patients with HNC developed CBS at our institution, and another 132 HNC patients were presented in 21 studies. Patients with CBS typically have a history of radiotherapy (89%), nodal metastasis (69%), and neck dissection (63%). This disease usually occurs proximal to the carotid bifurcation and is commonly associated with soft tissue necrosis in the neck (55%) and mucocutaneous fistulas (40%). Half of CBS patients present with sentinel bleeding, but 60% of patients will develop a life-threatening hemorrhage requiring emergent intervention. Over 90% of patients with CBS were treated...
with endovascular therapy, and surgical ligation was rarely indicated. The morbidity and mortality rates of patients with CBS are significant; only 23% have survived without evidence of disease. Conclusions: Carotid blowout syndrome is uncommon and can be rapidly fatal without prompt diagnosis and intervention. Although endovascular treatment within the carotid system can have a significant risk of mortality and neurologic morbidity, it has become the treatment of choice for CBS.

Source: CINAHL
Available in fulltext from Annals of Otology, Rhinology and Laryngology at EBSCOhost
Available in fulltext from Annals of Otology, Rhinology and Laryngology at EBSCOhost

Author(s) Trehan V, Sayal A, Wadhera R, Gulati SP, Meher R, Kalra V, Girhotra M
Citation: American Journal of Otolaryngology, July 2010, vol./is. 31/4(283-5), 0196-0709;1532-818X (2010 Jul-Aug)
Publication Date: July 2010
Source: Medline

22. Life-threatening late hemorrhage due to superior thyroid artery dissection after anterior cervical discectomy and fusion.
Author(s) Yu NH, Jahng TA, Kim CH, Chung CK
Citation: Spine, July 2010, vol./is. 35/15(E739-42), 0362-2436;1528-1159 (2010 Jul 1)
Publication Date: July 2010
Abstract: STUDY DESIGN: Case report.OBJECTIVE: The object of this report is to identify causes of late bleeding after anterior cervical discectomy and to suggest an optimal management plan.SUMMARY OF BACKGROUND DATA: The anterior discectomy and fusion is one of the most common spine procedures for cervical disc disease. Although this procedure has a low postoperative morbidity rate, rarely fatal vascular complications occur, the majority of which can be predicted intraoperatively. However, causes of unpredicted delayed bleeding are not fully understood.METHODS: We reviewed the hospital charts and radiographs of a patient who underwent coil embolization for late bleeding after anterior cervical discectomy with fusion (ACDF).RESULTS: A 33-year-old man underwent ACDF for cervical discs at C3-C4 and C4-C5. Intraoperatively, there was no major bleeding and the operation was completed after meticulous hemostasis. The patient was discharged 6 days after surgery without complications. However, at 16 days after surgery, the patient revisited the emergency room with sudden progressive neck swelling and accompanying respiratory difficulty. Because the neck swelling was rapidly progressing, the wound was opened in the intensive care unit under local anesthesia due to suspicion of hematoma. After evacuating the hematoma, we encountered active bleeding, which was controlled with gauze packing, but we were unable to identify the bleeding focus. After intubation, emergency right common carotid angiography was performed. Dissection of the right superior thyroid artery with active bleeding was identified, and this was promptly embolized with coils. After angiographic intervention, the remnant hematoma was removed in an operating room. The patient was discharged 5 days later without complication.CONCLUSION: This is the first report that shows late hemorrhage due to superior thyroid artery dissection after ACDF. This case cautions that intraoperative injury to an artery, unrecognized at operation, may cause late hemorrhage.

Source: Medline
Available in fulltext from Spine at the ULHT Library and Knowledge Services’ eJournal collection

23. [Rescue of postoperative carotid blowout in head and neck neoplasms].
OBJECTIVE: To investigate the prevention and rescuing measures of postoperative fatal bleeding induced by carotid blowout in head and neck tumors.

METHODS: Seven cases with postoperative carotid bleeding treated from October 2003 to August 2009 were reviewed retrospectively. Of the patients, 6 were with common carotid blowout and one with internal carotid artery blowout. All patients underwent pre- or post-operative radiotherapy for primary head and neck tumours and 3 patients had neck defect repair with deltopectoral skin flap, frontal flap or free radial arm flap respectively. After carotid blowout bleeding, the patients were treated in time with X ray transcatheter intervention including transcatheter arterial embolization (TAE) and self-expanding covered stent implantation, followed by repairing the carotid region with appropriate myocutaneous flaps.

RESULTS: Of 7 patients with carotid blowout, 5 patients were successfully rescued with X ray transcatheter intervention, of them 2 with self-expanding covered stent implantation and 2 with TAE respectively, and other 2 patients died due to rapid bleeding. Of the successfully rescued patients, 2 patients were with the repair of carotid area by pectoralis major myocutaneous flap, one by submental flap and one by local flap, but another one not with flap repair. Follow-up showed the 3 patients rescued with self-expanding covered stent implantation were survival for 6, 12, and 20 months, respectively, and the 2 patients rescued with TAE died of repeated carotid blowout in 2 and 13 months later, respectively.

CONCLUSIONS: The planned and timely X ray transcatheter intervention is an effective method to treat carotid blowout bleeding in the patients underwent head and neck tumour surgeries. Compared with TAE, self-expanding covered stent implantation may be more reliable for restoring the blood supply of head and neck region, with less complications. One-stage repair of carotid region with myocutaneous flap is of great importance to protect the carotid and to promote the wound healing.

Source: Medline
Abstract: Carotid blowout syndrome (CBS) is a high-risk condition associated with significant morbidity and mortality that may result from invasion and destruction of the cervical carotid vasculature from head and neck squamous cell carcinoma. Endovascular approaches offer multiple modalities for treatment to prevent morbidity and death. In this paper we review our experience in addressing CBS and present an up-to-date algorithm of endovascular management. 16 lesions were identified in 8 patients treated with 9 procedures over the past year. Pseudoaneurysm and/or active extravasation were documented in at least one vessel in all 8 cases presenting with acute CBS. There were 13 pseudoaneurysms in external carotid artery (ECA) trunk (5), ECA branches (4), internal carotid artery (ICA) (1) and common carotid artery (CCA) (3). There were 3 additional ICA lesions due to tumor infiltration, resulting in ICA occlusion (2) and long segment stenosis (1). Permanent vessel occlusion was performed in 11 lesions of the ECA trunk (4), ECA branches (4) and ICA (3). Stent-grafts were placed in 5 lesions in the CCA (3), ICA (1) and ECA trunk (1). Technical success and immediate hemostasis were achieved in all patients. There were no procedural deaths or immediate complications. With a median follow-up of 2 months (range, 1-13 months), three patients died: one from recurrent CBS, one from global brain ischemia after a cardiac arrest event unrelated to CBS and one from systemic disease. There was no other recurrence of bleeding or neurological complication. Endovascular techniques offer an armamentarium to effectively address CBS, significantly affecting the care and outcome in this particular oncologic population. These techniques should be offered as early as possible in the context of a multidisciplinary approach.

Source: EMBASE
Available in fulltext from Journal of NeuroInterventional surgery at Highwire Press

26. [Fatal hemorrhage following surgery for head and neck carcinoma].
Author(s) Ni S, Xu ZG, Wang XL, Liu SY, Qi YF, Tang PZ
Citation: Chung-Hua Chung Liu Tsa Chih [Chinese Journal of Oncology], January 2010, vol./is. 32/1(60-3), 0253-3766;0253-3766 (2010 Jan)
Publication Date: January 2010
Abstract: OBJECTIVE: To study the surgical management of fatal hemorrhage following head and neck surgery for cancer.METHODS: The clinical data of 32 cases of fatal hemorrhage following head and neck surgery from 1976 to 2008 in our department were analyzed retrospectively.RESULTS: Hemorrhage was caused by carotid blowout in 20 cases. The carotid ligation was performed in 13 cases, only 6 cases got long-term survival. In 12 cases, hemorrhage was caused by tracheo-innominate artery fistula, only 2 cases received surgical management, and no long-term survivors.CONCLUSION: Fatal hemorrhage following head and neck surgery is an uncommon but frequently fatal complication, and the successful management of it depends on early diagnosis and correct treatment.
Source: Medline

27. Massive hemorrhage during oral and maxillofacial surgery: ligation of the external carotid artery or embolization?
Author(s) Bouloux GF, Perciaccante VJ
Citation: Journal of Oral & Maxillofacial Surgery (02782391), 01 July 2009, vol./is. 67/7(1547-1551), 02782391
Publication Date: 01 July 2009
Source: CINAHL
Available in print at Lincoln County Hospital Professional Library

Author(s) Biswas D, Daudia A, Jones NS, McConachie NS

Citation: Journal of Laryngology & Otology, 01 June 2009, vol./is. 123/6(692-694), 00222151

Publication Date: 01 June 2009

Source: CINAHL

29. Complications of carotid blowout syndrome in patients with head and neck cancers treated by covered stents

Author(s) Chang F.-C., Luo C.-B., Lirng J.-F., Guo W.-Y., Wu H.-M., Teng M.M.H., Chang C.-Y.

Citation: Interventional Neuroradiology, November 2008, vol./is. 14/SUPPL. 2(29-33), 1123-9344 (November 2008)

Publication Date: November 2008

Abstract: The purpose of this study was to improve clinical assessment of carotid-blowout syndrome (CBS) in patients with head-and-neck cancers and with covered stents by evaluating immediate and delayed complications of reconstructive management. Eleven such patients were treated with self-expandable covered stents. We evaluated immediate and delayed complications by assessing clinical and imaging findings. Technical success and immediate hemostasis were achieved in all patients. Immediate complications were noted in four patients (36.4%), including thromboembolism in three patients and, in one patient, dissection of the carotid artery and type III endoleak by the overlapped self-expandable stent causing rebleeding. Delayed complications were noted in eight patients (72.7%), including six episodes of rebleeding in five patients, distal marginal stenosis in five patients, and delayed carotid thrombosis in three patients (one with brain abscess formation). We suggest close follow-up of the patients and aggressive re-intervention of their complications to improve outcomes.

Source: EMBASE

30. Endovascular covered stent reconstruction improved the outcomes of acute carotid blowout syndrome: Experiences at a Single Institute

Author(s) Chen Y.-L., Wong H.-F., Ku Y.-K., Wong A.M.-C., Wai Y.-Y., Ng S.-H.

Citation: Interventional Neuroradiology, November 2008, vol./is. 14/SUPPL. 2(23-27), 1123-9344 (November 2008)

Publication Date: November 2008

Abstract: Carotid blowout is a devastating complication in patients with head and neck cancer, commonly encountered as a delayed complication of radiation therapy. The clinical outcomes in patients with carotid blowout are discouraging; even transarterial embolization has been performed to control the acute massive bleeding. In recent years, covered stents have been reported as an alternative treatment producing favorable results. In this study, 13 consecutive patients with acute carotid blowout syndrome were treated at our institute by covered-stent reconstruction between December 2005 and December 2007. The median posthemorrhagic survival period after reconstruction (187 days) was more than that reported in patients treated only with transarterial embolization (26 days). Though the estimated mortality was about 54%, those who survived showed favorable outcomes, and only one transit complication of acute in-stent thrombosis occurred. Thus, endovascular covered-stent reconstruction is a safe and effective approach to manage acute carotid blowout syndrome.

Source: EMBASE

31. Endovascular management of carotid blowout syndrome in patients with head
Abstract: Endovascular treatments for carotid blowout syndrome (CBS) have been advocated by interventional neuroradiologists. We therefore retrospectively evaluated the efficacy of endovascular treatments of CBS in 16 patients with head and neck cancers (HNC). The clinical, treatment and outcome data were evaluated in 16 HNC patients with CBS, all of whom underwent permanent embolization or covered stent graft of the affected carotid artery. All patients received multimodal treatments, including radiotherapy (mean total dose, 78.5 Gy). CBS was caused by tumor carotid invasion in 8 patients, pharyngocutaneous fistula in 7, and laryngeal chondroradionecrosis in 1, with the external and common carotid arteries being the most common rupture sites. CBS was occluded by embolization or revascularized by covered stent placement. Immediate hemostasis was achieved in all patients; however, 7 patients had recurrent CBS, all of whom were retreated effectively by endovascular management. Three patients had strokes and four had extrusion of intervention materials from the infected wounds. Most patients died of tumor progression, with a mean survival time of five months from initial CBS; only two patients survived. Endovascular therapy, by both permanent occlusion and stent grafts, is effective in hemostasis of CBS but its long-term efficacy may not be high in these HNC patients.

Source: EMBASE

32. A self-expandable stent overlapped with a stent-graft as a cause of endoleak in a patient with carotid blowout syndrome


Source: EMBASE

33. Endovascular carotid reconstruction in palliative head and neck cancer patients with threatened carotid blowout presents a beneficial supportive care measure.

Abstract: ABSTRACT Carotid blowout is a devastating complication in patients with head and neck malignancy. The traditional surgical treatment for carotid blowout is often technically difficult and is associated with an unacceptably high morbidity and mortality. Recently, endovascular therapy has been proposed for head and neck surgical patients. Preliminary reports showed a better outcome with less morbidity and mortality compared to the previous treatment modalities. The use of such techniques in cases of impending or acute carotid blowout syndrome has been previously described to be beneficial for palliative head and neck cancer patients as well. We introduce a case of a head and neck cancer patient receiving palliative care, presenting with threatened carotid blowout, who was managed with endovascular placement of a covered stent under elective conditions in order to prevent an inevitable carotid rupture. In the present case endovascular carotid stenting allowed preservation of the vessel, prevented the dramatic situation of carotid rupture, and facilitated a rapid hospital discharge without any neurologic or stenting sequelae.
34. Patients with head and neck cancers and associated postirradiated carotid blowout syndrome: endovascular therapeutic methods and outcomes.

**Author(s)** Chang FC, Lirng JF, Luo CB, Wang SJ, Wu HM, Guo WY, Teng MM, Chang CY

**Citation:** Journal of Vascular Surgery, May 2008, vol./is. 47/5(936-45), 0741-5214;0741-5214 (2008 May)

**Publication Date:** May 2008

**Abstract:** PURPOSE: This study retrospectively evaluated the technical and hemostatic outcomes of reconstructive and deconstructive endovascular management in patients with head and neck cancers associated with carotid blowout syndrome (CBS). METHODS: Twenty-four patients with head and neck cancers with CBS involving the main trunk of carotid artery underwent endovascular therapy. This included reconstructive management with self-expandable stent grafts to preserve the diseased carotid artery in 11 patients and deconstructive management with balloons, coils, or acrylic adhesives to occlude the diseased carotid artery in 13 patients. Based on clinical severity and therapeutic priority, we classified CBS in our patients into two groups: acute or impending and threatened. The angiographic severity was graded from 0 to 3. Evaluation of technical outcome included technical success, initial and delayed complications, and patency of stent graft in the reconstructive group. The hemostatic outcome was evaluated by immediate hemostatic result, rebreeding, and duration of hemostasis. Sex, age, clinical and angiographic severities, local wound complications, and location of the pathologic lesion were examined as predictors of the technical and hemostatic outcomes of endovascular management by using Cox regression method. RESULTS: Technical success and immediate hemostasis were achieved in all patients of both groups. Initial complications during the procedures were encountered in four patients (36.4%) who underwent reconstructive management and in one patient (7.7%) who underwent deconstructive management (P = .142). Delayed complications during the follow-up were seen in one patient (9.1%) with reconstructive management and one patient (7.7%) with deconstructive management (P > .99). Rebleeding occurred in five patients (45.5%) in the reconstructive management group and in three patients (23.1%) in the deconstructive management group (P = .659). The mean duration of hemostasis after initial reconstructive and deconstructive management was 4.0 +/- 8.1 and 8.5 +/- 10.1 months, respectively (P = .249). Rebleeding was noted in 7 of 11 patients (63.6%) with acute CBS and in 1 of 13 patients (7.7%) with impending and threatened CBS (P = .008). CONCLUSION: There is no significant difference in technical and hemostatic outcomes between the reconstructive and deconstructive endovascular management methods. Hemostatic results were influenced by clinical severity. The rebleeding rate is higher in patients with advanced and acute clinical severity.

**Source:** Medline

35. Stent-grafts in the treatment of emergent or urgent carotid artery disease: review of 25 cases.

**Author(s)** Hoppe H, Barnwell SL, Nesbit GM, Petersen BD

**Citation:** Journal of Vascular & Interventional Radiology, January 2008, vol./is. 19/1(31-41), 1051-0443;1051-0443 (2008 Jan)

**Publication Date:** January 2008

**Abstract:** PURPOSE: To report the authors’ initial experience with carotid artery stent-grafts in a comparatively large patient series for the treatment of acute bleeding and impending rupture or the prevention of distal embolization. MATERIALS AND METHODS: This retrospective study was approved by the institutional review boards and performed according to HIPPA standards. Twenty-five patients were treated with 27 carotid artery stent-grafts (Gore Viabahn, n = 10; Bard Fluency, n = 9; polytetrafluoroethylene-covered Palmaz, n = 5; and Wallgraft, n = 3). Thirteen stent-grafts were placed in patients with carotid blow-out syndrome (including three patients with carotid-airway fistula), 12 in patients with either pseudoaneurysm (n = 9) or true aneurysm (n = 3), and two in patients...
with intractable high-grade bare stent restenosis. RESULTS: The technical success rate was 100% (27 of 27 cases). No acute procedural transient ischemic attacks or strokes occurred. Procedural dissections occurred in two of the 27 cases (7.4%). Short-term complications occurred in three of the 27 cases (11%) (repeat hemorrhage, n = 2; common carotid artery occlusion, n = 1). The overall patient mortality rate was 36% (nine of 25 patients, all with carotid blow-out syndrome). Six-month follow-up in 15 of the 16 living patients demonstrated widely patent stent-grafts. Two patients with pseudoaneurysm also demonstrated patent stents at 18- and 33-month follow-up. CONCLUSIONS: Stent-grafts may be useful in the treatment of carotid artery bleeding syndrome, aneurysm, and stenosis, with a high procedural success rate in selected cases. The results of mid-term follow-up are encouraging, but results of long-term follow-up must be evaluated in future studies.

Source: Medline


Author(s) Luo CB, Teng MM, Chang FC, Chang CY, Guo WY

Citation: Otolaryngology - Head & Neck Surgery, January 2008, vol./is. 138/1(86-91), 0194-5998;0194-5998 (2008 Jan)

Publication Date: January 2008

Abstract: OBJECTIVE: To report clinical manifestations, angiographic features, and outcomes of endovascular management in 14 patients with 15 radiation carotid blowout syndromes of nasopharyngeal carcinomas. STUDY DESIGN AND SUBJECTS: Retrospective chart review of 14 patients with nasopharyngeal carcinomas (mean age 49 years) with 15 radiation carotid blowout syndromes who had undergone endovascular embolization to manage oronasal bleeding in the past 10 years. RESULTS: Average radiation dose to affected carotid artery was 73 gray units (latent period: 33 months). Radiation carotid blowout syndrome was detected in internal (n = 10), external (n = 4), or common carotid artery (n = 1). Detachable balloons were used in 11 affecting arteries for vascular occlusion; 4 were treated by liquid adhesives or coil. Endovascular treatment was successful in all 15 radiation carotid blowout syndromes with cessation of hemorrhage. One patient had hemiparesis after embolization. Mean clinical follow-up was 21 months. CONCLUSION: Radiation carotid blowout syndrome in nasopharyngeal carcinoma may occur in various periods or arteries. Endovascular embolization provides both safe and effective management.

Source: Medline

37. The emergency use of endografts in the carotid circulation to control hemorrhage in potentially contaminated fields.

Author(s) Sorial E, Valentino J, Given CA, Endean ED, Minion DJ

Citation: Journal of Vascular Surgery, October 2007, vol./is. 46/4(792-8), 0741-5214;0741-5214 (2007 Oct)

Publication Date: October 2007

Abstract: We report our experience with the use of endoluminal grafts to control emergency bleeding in two patients with tracheoinnominate fistulas and three patients with carotid blowouts. Systemic infectious complications were not seen. However, rebleeding occurred in one patient, and extensive stent coverage to control bleeding was required in a second. Survival was usually limited by the patient's cancer. There was one long-term survivor without cancer whose tracheostomy was placed for neurologic compromise. A review of the literature for similar cases identified 18 additional endografts placed for carotid blowout and 3 placed for tracheoinnominate fistulas. Overall, infectious complications occurred in only two patients, whereas rebleeding occurred in eight patients. On the basis of these findings, we believe that endografts are useful to control emergency hemorrhage in these two pathologies because treatment is usually palliative, given the poor survival secondary to the underlying disease. However, more extensive graft coverage may
be necessary considering the erosive nature of these processes. 

Source: Medline

38. Placement of covered stents for carotid blowout in patients with head and neck cancer: Follow-up results after rescue treatments

Author(s) Pyun H.W., Lee D.H., Yoo H.M., Lee J.H., Choi C.G., Kim S.J., Suh D.C.

Citation: American Journal of Neuroradiology, September 2007, vol./is. 28/8(1594-1598), 0195-6108 (September 2007)

Publication Date: September 2007

Abstract: BACKGROUND AND PURPOSE: Placement of a covered stent to control carotid blowout (CB) in malignant tumors of the head and neck has been reported to be an effective treatment. However, it is not uncommon to encounter recurrent hemorrhage. The purpose of this study was to evaluate the follow-up results of patients treated with covered stents. MATERIALS AND METHODS: We retrospectively reviewed the results of 7 consecutive patients who underwent placement of a covered stent to control CB. Most of them had poor wound healing because of previous irradiation, surgery, or both. The initial procedures were successful in all patients. Their clinical course was reviewed for rebleeding, additional endovascular treatments in recurrent cases, and outcomes. RESULTS: Recurrence developed in 6 of 7 patients. The interval between the first procedure and the hemorrhagic event was from 3 to 44 days. In 6 patients who had a recurrent CB, 4 had rebleeding from the previous site of the stent, whereas 2 other patients experienced recurrent bleeding in a different area from the site of the stent. Additional endovascular treatments were carried out in all affected patients by another insertion of a covered stent (n = 3), coil embolization (n = 2), or insertion of a covered stent followed by permanent arterial occlusion (n = 1). CONCLUSION: Placement of a covered stent in patients with head and neck cancer who sustain CB showed frequent rebleeding despite favorable initial rescue results. Recurrent CB at the previous stent site developed frequently in patients with uncontrolled wound infection. Concomitant or short-interval arterial trapping should be considered selectively in those conditions.

Source: EMBASE

Available in fulltext from American Journal of Neuroradiology at Highwire Press

39. Iliac stent graft for common carotid artery rupture

Author(s) Rigatelli G., Sacco L.L., Sacco A., Bedendo E., Cardaioli P.

Citation: Cardiovascular Revascularization Medicine, July 2007, vol./is. 8/3(226-227), 1553-8389 (July/September 2007)

Publication Date: July 2007

Source: EMBASE

40. Covered stent treatment of carotid blowout syndrome

Author(s) Gaba R.C., West D.L., Bui J.T., Owens C.A., Marden F.A.

Citation: Seminars in Interventional Radiology, March 2007, vol./is. 24/1(47-52), 0739-9529 (March 2007)

Publication Date: March 2007

Abstract: Carotid artery blowout is a devastating complication of head and neck malignancy, irradiation, and trauma. New endovascular therapies of acute carotid artery rupture involve stent-directed, carotid-sparing treatment strategies. We report a case of successful covered stent treatment of carotid artery hemorrhage in the setting of head and neck cancer and review the literature describing the use of this therapeutic method. Evaluation of 19 recently reported cases of covered stent treatment of carotid artery blowout due to head and neck cancer and presenting with sentinel or acute hemorrhage demonstrates that this method is a fast and effective means of controlling bleeding, with a
technical success rate of ~95%. A significant early recurrent hemorrhage rate raises concern regarding the short-term safety and efficacy of this therapy, however, and suggests that stent graft treatment of carotid artery rupture due to head and neck malignancy is best suited as a temporizing measure before more definitive therapy. Copyright 2007 by Thieme Medical Publishers, Inc.

Source: EMBASE
Available in fulltext from Seminars in Interventional Radiology at National Library of Medicine

41. Carotid blowout syndrome in patients with head-and-neck cancers: Reconstructive management by self-expandable stent-grafts

Author(s) Chang F.-C., Lirng J.-F., Luo C.-B., Guo W.-Y., Teng M.M.H., Tai S.-K., Chang C.-Y.
Citation: American Journal of Neuroradiology, January 2007, vol./is. 28/1(181-188), 0195-6108 (January 2007)
Publication Date: January 2007
Abstract: BACKGROUND AND PURPOSE: Some reports of reconstructive management of carotid blowout syndrome (CBS) with stent-grafts are promising, but some are unfavorable. This study sought to evaluate the hemostatic efficacy, safety, and outcome of reconstructive, endovascular stent-graft placement in patients with head-and-neck cancers in association with CBS. METHODS: Eight patients with head-and-neck cancers with CBS were treated with self-expandable stent-grafts. We evaluated the initial hemostatic results, complications, and outcomes by assessing the clinical and imaging findings. RESULTS: Immediate hemostasis was achieved in all patients. Initial complications included stroke in 1 patient and asymptomatic thrombosis of the carotid artery in 2 patients. Delayed complications included rebleeding, delayed carotid thrombosis, and brain abscess formation. Rebleeding was noted in 4 patients and was successfully managed with a second stent-graft and embolization in 2 of them. Delayed carotid thrombosis with follow-up after 3 months was found in 3 patients, 1 of whom had associated brain abscesses. CONCLUSION: Although stent-grafts achieved immediate and initial hemostasis in patients with head-and-neck cancers and CBS, long-term safety, stent patency, and permanency of hemostasis appeared unfavorable. This treatment may be for temporary or emergency purposes rather than serving as a permanent measure. We suggest its applications in patients with acute CBS that precludes performance of an occlusion test, as well as when carotid occlusion poses an unusually high risk of neurologic morbidity. We also propose prophylactic antibiotic treatment and combined embolization of pathologic vascular feeders to improve outcomes.

Source: EMBASE
Available in fulltext from American Journal of Neuroradiology at Highwire Press

42. Endoluminal stent placement in the management of recurrent carotid blowout syndrome

Author(s) Kasthoori J.J., Nawawi O.
Citation: Journal of the Hong Kong College of Radiologists, 2007, vol./is. 10/2(62-65), 1029-5097 (2007)
Publication Date: 2007
Abstract: This report is of a patient with acute carotid blowout syndrome that was managed successfully with emergency placement of a covered stent. A 68-year-old man with carcinoma of the tongue had been treated surgically and underwent repeated radiotherapy for recurrence. He presented with intermittent brisk bleeding from a wound in his neck. An urgent carotid angiogram was performed and revealed a pseudoaneurysm, for which a covered stent was successfully placed. 2007 Hong Kong College of Radiologists.

Source: EMBASE
43. Carotid artery haemorrhage: an uncommon complication of constipation in a patient with severe haemophilia A.

**Author(s)** Shortt J, Street AM  
**Citation:** European Journal of Haematology, December 2006, vol./is. 77/6(544), 0902-4441;0902-4441 (2006 Dec)  
**Publication Date:** December 2006  
**Source:** Medline  
Available in fulltext from European Journal of Haematology at EBSCOhost

44. Transarterial embolization of acute external carotid blowout syndrome with profuse oronasal bleeding by N-butyl-cyanoacrylate.

**Author(s)** Luo CB, Teng MM, Chang FC, Chang CY  
**Citation:** American Journal of Emergency Medicine, October 2006, vol./is. 24/6(702-8), 0735-6757;0735-6757 (2006 Oct)  
**Publication Date:** October 2006  
**Abstract:** OBJECTIVES: Assess duration, efficacy, and safety of emergent transarterial embolization of acute external carotid blowout syndrome (ECBS) with N-butyl-cyanoacrylate. METHODS: Medical records were reviewed for 16 patients (15 men, 1 woman; age range, 28-85 years) who had 17 acute ECBS events that presented with profuse transoronasal bleeding. Predisposing factors were carcinoma associated with surgery and/or radiotherapy (n = 14) or trauma (n = 3). Affected arteries were the internal maxillary artery (n = 5), superior thyroid artery (n = 4), lingual artery (n = 4), facial artery (n = 2), or ascending pharyngeal artery (n = 2). RESULTS: Endovascular treatment successfully obliterated all acute ECBSs with cessation of profuse hemorrhage. Mean duration of procedure was 54 minutes. Three patients had recurrent carotid blowout syndrome events, with 1 resulting death. Clinical follow-up range was 2 to 23 months. CONCLUSIONS: Transarterial N-butyl-cyanoacrylate embolization can successfully manage acute ECBS with profuse hemorrhage. The technique is both efficient and safe, and the procedure can be rapidly completed.  
**Source:** Medline

45. Endovascular management of the carotid blowout syndrome.

**Author(s)** Broomfield SJ, Bruce IA, Luff DA, Birzgalis AR, Ashleigh RJ  
**Citation:** Journal of Laryngology & Otology, August 2006, vol./is. 120/8(694-7), 0022-2151:1748-5460 (2006 Aug)  
**Publication Date:** August 2006  
**Abstract:** Bleeding from the carotid artery or its branches (‘carotid blowout’) is a well recognized complication following treatment or recurrence of head and neck cancer. The traditional surgical treatment for carotid blowout is often technically difficult and is associated with an unacceptably high morbidity and mortality. The majority of such patients are currently treated conservatively with end of life supportive measures. We report the case of a young patient with recurrent supraglottic carcinoma complicated by carotid blowout on two separate occasions over a five month period, which was successfully treated endovascularly under local anaesthetic, without neurological sequelae. With the continuing development of interventional radiology, endovascular techniques are now emerging as a viable, low morbidity treatment option in selected patients.  
**Source:** Medline  
Available in print at Lincoln County Hospital Professional Library  
Available in print at Pilgrim Hospital Staff Library

**Author(s)** Chang FC, Lirng JF, Tai SK, Luo CB, Teng MM, Chang CY

**Citation:** Ajnr: American Journal of Neuroradiology, August 2006, vol./is. 27/7(1543-5), 0195-6108;0195-6108 (2006 Aug)

**Publication Date:** August 2006

**Abstract:** A patient with hypopharyngeal cancer developed carotid blowout syndrome (CBS) treated by self-expandable stent-graft in the left carotid artery. CT scan for progressive right hemiparesis 4 months later showed multiple left cerebral abscesses and left carotid thrombosis. Although deployment of stent-grafts for CBS can achieve initial hemostasis in patients with head-and-neck cancer, the placement of a stent-graft in a field of necrosis and infection is associated with poor long-term outcome. We recommend the use of prophylactic antibiotics if endovascular foreign materials are placed in a contaminated field.

**Source:** Medline

Available in fulltext from American Journal of Neuroradiology at [Highwire Press](https://www.highwire.org)

47. Brain abscess formation: A delayed complication of carotid blowout syndrome treated by self-expandable stent-graft

**Author(s)** Chang F.-C., Lirng J.-F., Tai S.-K., Luo C.-B., Teng M.M.H., Chang C.-Y.

**Citation:** American Journal of Neuroradiology, August 2006, vol./is. 27/7(1543-1545), 0195-6108 (August 2006)

**Publication Date:** August 2006

**Abstract:** A patient with hypopharyngeal cancer developed carotid blowout syndrome (CBS) treated by self-expandable stent-graft in the left carotid artery. CT scan for progressive right hemiparesis 4 months later showed multiple left cerebral abscesses and left carotid thrombosis. Although deployment of stent-grafts for CBS can achieve initial hemostasis in patients with head-and-neck cancer, the placement of a stent-graft in a field of necrosis and infection is associated with poor long-term outcome. We recommend the use of prophylactic antibiotics if endovascular foreign materials are placed in a contaminated field.

**Source:** EMBASE

Available in fulltext from American Journal of Neuroradiology at [Highwire Press](https://www.highwire.org)

48. Radiation acute carotid blowout syndromes of the ascending pharyngeal and internal carotid arteries in nasopharyngeal carcinoma

**Author(s)** Luo C.-B., Teng M.M.-H., Chang F.-C.

**Citation:** European Archives of Oto-Rhino-Laryngology, July 2006, vol./is. 263/7(644-646), 0937-4477 (July 2006)

**Publication Date:** July 2006

**Abstract:** Acute carotid blowout syndrome (CBS) was defined as free rupture of the carotid artery associating with catastrophic hemorrhage. Most radiation acute CBSs in nasopharyngeal carcinoma (NPC) are found in petrous segment of the internal carotid artery (ICA) because of high-dose radiation in this area associated with nearby osteonecrosis. The occurrence of acute CBSs in the small branch of the external carotid artery and cervical ICA following radiotherapy in NPC patient is very rare. We present a rare case of NPC with radiation acute CBSs in the ascending pharyngeal and cervical ICA in a 3-month interval that were successfully managed by endovascular embolization. Springer-Verlag 2006.

**Source:** EMBASE

Available in fulltext from European Archives of Oto-Rhino-Laryngology at [EBSCOhost](https://www.ebscohost.com)
49. The application of covered stent in the rescue treatment of carotid blowout with pseudoaneurysm formation

Author(s) Xu G.-F., Dae C.-S., Ho S.K.

Citation: Journal of Interventional Radiology, March 2006, vol./is. 15/3(142-145), 1008-794X (March 2006)

Publication Date: March 2006

Abstract: Objective: To evaluate the result of covered stent for carotid blowout with pseudoaneurysm formation. Methods: Four patients with carotid blow out accompanied by pseudoaneurysm formation due to head and neck malignancies, who presented with life-threatening massive neck or oral bleedings, were treated with self-expanding polytetrafluoroethylene(PTFE)-covered nitinol stents through percutaneous transluminal approach. Results: Covered stents were successfully performed in four patients, one in the mid portion of common carotid artery(CCA), two in the carotid bulb, and one in the distal CCA, containing six stents altogether. After treatment, angiography showed successful occlusion of the pseudoaneurysm, patency of carotid artery lumen, and significant improvement of clinical symptoms without neurologic deficit. One patient with the mid portion blowout of CCA, showed extension of the previous pseudoaneurysm below the lower margin of the stent 11 days after the first stent placement, so that the second covered stent was placed with no recurrent hemorrhage on the two months follow-up. Another patient with pseudoaneurysm near the carotid bulb, showed angiographically the successful occlusion of the pseudoaneurysm after coil embolization and placement of covered stent and bare stent, but extension of pseudoaneurysm in lower margin of the previous stent was found six weeks after the procedure, an additional covered stent was deployed with stoppage of bleeding. Conclusions: Self-expanding covered nitinol stenting is a safe and effective option for carotid blowout with pseudoaneurysm formation, especially for rescue treatment of life-threatening bleeding pseudoaneurysm of the carotid artery. Long-term follow-up and larger series are required for further evaluation of the stent efficacy.

Source: EMBASE

50. Life-threatening common carotid artery blowout: Rescue treatment with a newly designed self-expanding covered nitinol stent


Citation: British Journal of Radiology, March 2006, vol./is. 79/939(226-231), 0007-1285 (March 2006)

Publication Date: March 2006

Abstract: Carotid blowout is a devastating complication in patients with head and neck malignancy. A covered stent offers an alternative to treatment of a carotid blowout patient thought to be at high risk for surgery or carotid occlusion. Stent placement in the common carotid artery or carotid bulb is a technical challenge because of large luminal diameter and luminal calibre discrepancy between internal carotid artery and common carotid artery. We present four patients with common carotid rupture and massive bleeding who were treated with self-expanding covered stents, among them, two cases were treated with newly designed self-expanding polytetrafluoroethylene (PTFE)-covered nitinol stents. 2006 The British Institute of Radiology.

Source: EMBASE

Available in fulltext from British Journal of Radiology at Highwire Press
Available in print at Lincoln County Hospital Professional Library


Author(s) Sesterhenn AM, Iwinska-Zelder J, Dalchow CV, Bien S, Werner JA
AIMS: Acute or subacute haemorrhage is one of the most frightening complications in patients suffering from advanced head and neck cancer. Few articles report experience with superselective endovascular therapy for this purpose. Is endovascular therapy underestimated in the field of palliative head and neck cancer therapy? This study set out to investigate this question. PATIENTS AND METHODS: A review was undertaken of the clinical courses of seven patients (six men, one woman) suffering from incurable, advanced head and neck cancer (four pharyngeal, two laryngeal, one neck) and treated with superselective endovascular strategies as an emergency procedure for acute bleeding. RESULTS: All patients were successfully treated without evidence of neurological complication. Patients reached a median survival of 20 weeks (range eight-168 weeks). Following endovascular treatment all patients were discharged from the hospital within several days. Three patients survived almost free of symptoms for several weeks and were able to stay at home with their families until their death. CONCLUSION: We conclude that in the field of palliative care, superselective endovascular therapy deserves to be considered alongside standard treatment options for the management of acute haemorrhage from advanced head and neck cancer.

Source: CINAHL
Available in print at Lincoln County Hospital Professional Library
Available in print at Pilgrim Hospital Staff Library

52. Critical spontaneous rupture of a common carotid artery pseudo-aneurysm.

Author(s) Masuda K, Ozawa H, Fujii M, Kimura S, Nagasaki K, Matsunaga T, Tsunoda K
Citation: Lancet, 10 December 2005, vol./is. 366/9502(2034-2034), 01406736
Publication Date: 10 December 2005
Source: CINAHL
Available in print at Pilgrim Hospital Staff Library
Available in fulltext from Lancet, The at Elsevier
Available in print at Grantham Hospital Staff Library
Available in print at Lincoln County Hospital Professional Library

53. Carotid blowout treated by direct percutaneous puncture of internal carotid artery with temporary balloon occlusion

Author(s) Chang F.-C., Linrg J.-F., Luo C.-B., Teng M.M.H., Guo W.-Y., Chang C.-Y.
Citation: Interventional Neuroradiology, December 2005, vol./is. 11/4(349-354), 1123-9344 (December 2005)
Publication Date: December 2005
Abstract: Direct percutaneous puncture of a cervical carotid pseudoaneurysm for coil placement or acrylic embolization is described for the endovascular management of acute carotid blowout. However, direct puncture of the internal carotid artery (ICA) for the endovascular management of carotid blowout has not been described. We report a difficult case of acute carotid blowout syndrome in a patient who had radiation-induced occlusion of the right common carotid artery with vasculopathy and pseudoaneurysm in the right cervical ICA. Collaterals from the branches of the controlateral external carotid artery (ECA) anastomosed with branches of right ECA supplied the vasculopathy. We performed direct percutaneous puncture of the bulb of the right ICA using a spinal needle and placed fiber coils to occlude antegrade flow of the artery. During the injection of a mixture of N-butyl cyanoacrylate and lipiodol oil for embolization of the remaining carotid bulb, we transiently inflated an occlusion balloon in the controlateral common carotid artery to further arrest antegrade flow in the ICA. The vasculopathy and pseudoaneurysm of the right cervical ICA
were successfully embolized, with preservation of the distal branches of the right ICA.

Source: EMBASE

54. Radiology quiz case 2... spontaneous rupture of the left common carotid artery.
Author(s) Chen S, Young C, Cheng P
Citation: Archives of Otolaryngology - Head & Neck Surgery, 01 September 2005, vol./is. 131/9(822-824), 08864470
Publication Date: 01 September 2005
Source: CINAHL
Available in fulltext from Archives of Otolaryngology - Head and Neck Surgery at Silverchair Information Systems
Available in fulltext from Archives of Otolaryngology - Head and Neck Surgery at Highwire Press
Available in print at Pilgrim Hospital Staff Library

55. The management of carotid artery rupture
Author(s) Upile T., Triaridis S., Kirkland P., Archer D., Searle A., Irving C., Evans P.R.
Citation: European Archives of Oto-Rhino-Laryngology, August 2005, vol./is. 262/7(555-560), 0937-4477 (August 2005)
Publication Date: August 2005
Abstract: Carotid artery rupture is fortunately an uncommon complication of head and neck cancer treatment. Eleven episodes of carotid artery rupture following irradiation and major head and neck resection were identified over a 6-year period. We review our experience and discuss the predisposing factors that can cause this complication, important aspects of management and outcome. During this 6-year period, 11 episodes of carotid artery rupture were treated in our unit. All patients had received prior irradiation (more than 60 Gy) and undergone a major surgical resection or resections. The average age was 59 years; all patients had a salivary fistula, local infection and a manifest 'herald bleed' just before their major carotid artery rupture. These patients were resuscitated, taken to theatre and the neck explored, with control of the vessel and debridement of necrotic tissue. Soft tissue coverage was in the form of a flap. Many of the factors predisposing to carotid artery rupture can be ameliorated or treated early in order to avoid this complication. Early and aggressive nutritional support together with correction of haematological abnormalities promote wound healing and prevent tissue breakdown. The detection and treatment of infection also reduces fistula formation and wound compromise. We present our protocol for the early, aggressive management of these patients with carotid artery rupture. Springer-Verlag 2005.
Source: EMBASE
Available in fulltext from European Archives of Oto-Rhino-Laryngology at EBSCOhost

56. Carotid artery rupture during angioplasty: Endovascular treatment and 5-year follow-up [Portuguese] Ruptura carotidea durante angioplastia: Tratamento endovascular e seguimento por 5 anos
Author(s) Andrade G., Marques R., Pires N.B., Abath C.
Citation: Jornal Vascular Brasileiro, June 2005, vol./is. 4/2(200-204), 1677-5449;1677-5449 (June 2005)
Publication Date: June 2005
Abstract: The carotid artery angioplasty has emerged as a potential therapeutic alternative for the atherosclerotic disease. There are several possible complications, but the carotid artery rupture is very rare, and the management ranges from conservative to open surgery. We report a case of carotid rupture during angioplasty. A conservative management with
balloon inflation was attempted, but a stent-graft was necessary to control the active bleeding. The recovery was uneventful, and during the 61-month follow-up, the patient was asymptomatic with normal carotid ultrasonography. We alert that a rupture of a carotid artery during angioplasty is rare, but the risk is real. The endovascular treatment of that laceration is possible and effective, presenting an excellent mid-term outcome. Copyright 2005 by Sociedade Brasileira de Angiologia e Cirurgia Vascular.

**Source:** EMBASE

**57. Emergent endovascular treatment with direct carotid puncture for exsanguinating Carotid Blowout Syndrome.**

**Author(s)** Wang H, Fraser K, Bortolotti C, Lanzino G

**Citation:** Neurocritical Care, 2005, vol./is. 2/2(176-8), 1541-6933;1541-6933 (2005)

**Publication Date:** 2005

**Abstract:** INTRODUCTION: Carotid Blowout Syndrome (CBS) carries an exceedingly high mortality rate. Various established endovascular techniques are successful in treating less acute CBS, but exsanguinating patients with hemodynamic compromise continue to pose a significant clinical challenge. METHODS: We report a 53-year-old male with squamous cell carcinoma of the anterior tongue presented with a sentinel hemoptysis followed by a massive oral hemorrhage. The patient suffered a cardiac arrest secondary to acute blood loss, from which he was successfully resuscitated. RESULTS: An occlusion technique is presented involving direct carotid puncture for successful treatment of hemodynamically unstable, exsanguinating patients. CONCLUSION: This technique accomplishes rapid arrest of exsanguination, minimal hemorrhage site manipulation, and successful carotid occlusion.

**Source:** Medline

**58. Carotid blowout with infection: management with endovascular and open vascular approaches--a case report.**

**Author(s)** Hertz JA, Valentino J, Kwolek CJ, Endean ED

**Citation:** Vascular & Endovascular Surgery, September 2004, vol./is. 38/5(477-81), 1538-5744;1538-5744 (2004 Sep-Oct)

**Publication Date:** September 2004

**Abstract:** The management of patients with head and neck cancer can be complicated by massive carotid artery hemorrhage, often requiring ligation owing to the emergent conditions and scarring from previous surgery and radiation. A case of emergent endovascular management of carotid artery hemorrhage in a patient treated for pharyngeal carcinoma is described. Hemorrhage was controlled, but on follow-up the patient developed a carotid-cutaneous fistula with exposure of the coils. Further management required the use of autogenous vein to replace the involved vessels. This case demonstrates that endovascular control of carotid hemorrhage can be successful, but close follow-up is necessary to identify potential subsequent complications.

**Source:** Medline

Available in fulltext from Vascular and Endovascular Surgery at EBSCOhost

**59. Outcomes for overlapping stents in the extracranial carotid artery**

**Author(s)** Lesley W.S., Weigele J.B., Chaloupka J.C.

**Citation:** Catheterization and Cardiovascular Interventions, July 2004, vol./is. 62/3(375-379), 1522-1946 (July 2004)

**Publication Date:** July 2004

**Abstract:** Various diseases of the carotid artery are treatable by stenting. However, few reports of overlapping carotid stents exist. As a result, the indications, long-term outcomes, and potential complications of this technique remain largely unknown. We therefore present
and examine a series of 11 patients treated by this unique stenting method. A retrospective single-institution review was performed for patients in whom overlapping carotid stents were placed. Only patients with imaging follow-up beyond 3 months were included. Of 38 patients who had extracranial carotid artery stents placed, 11 patients fulfilled the inclusion criteria for both overlapping stents and imaging follow-up greater than 3 months (range, 0.4-3 years; mean, 1.3 years). Clinical follow-up ranged between 0.4 and 3.6 years (mean, 2.1 years). Carotid pathology within this cohort included atheromatous stenosis (n = 3), recurrent stenosis following carotid endarterectomy (n = 2) or stenting (n = 1), postirradiation angiitis (n = 1), carotid artery kink created by initial stent placement (n = 2), and both traumatic (n = 1) and neoplastic (n = 1) carotid blowout syndrome. No permanent stroke or stenting-related death occurred. Focal stenosis or intimal hyperplasia resulting in 35% or less luminal narrowing developed in three patients (27%) after tandem stenting. Overlapping stents provide a durable treatment for a variety of extracranial carotid pathologies. Clinically and hemodynamically significant (> 50%) poststenting stenosis or intimal hyperplasia did not occur in this series. 2004 Wiley-Liss, Inc.

Source: EMBASE

60. Delayed Complications of Endovascular Stenting for Carotid Blowout

Author(s) Simental A., Johnson J.T., Horowitz M.

Citation: American Journal of Otolaryngology - Head and Neck Medicine and Surgery, November 2003, vol./is. 24/6(417-419), 0196-0709 (November/December 2003)

Publication Date: November 2003

Abstract: Endovascular stents are used in a wide variety of situations including management of acute hemorrhage from a carotid artery blowout. The long-term efficacy of these devices in this setting has not been elucidated. Two cases of carotid stenting for carotid artery blowouts in the face of cervical malignancy and overlying infection were followed over time. In both patients, initial control of carotid bleeding was followed by delayed stent-related complications. Although carotid stents are useful for control of acute carotid blowouts, their long-term efficacy in the setting of head and neck malignancy and overlying infection is suspect.

Source: EMBASE

61. Preliminary experience with endovascular reconstruction for the management of carotid blowout syndrome.

Author(s) Lesley WS, Chaloupka JC, Weigele JB, Mangla S, Dogar MA

Citation: Ajnr: American Journal of Neuroradiology, May 2003, vol./is. 24/5(975-81), 0195-6108; 0195-6108 (2003 May)

Publication Date: May 2003

Abstract: BACKGROUND AND PURPOSE: Permanent balloon occlusion (PBO) of the carotid artery has been previously shown to be an effective means to treat carotid blowout syndrome (CBS). However, despite the effectiveness of this endovascular technique, concern remains regarding its potential for producing delayed cerebral ischemic complications in 15% to 20% of patients. This significant limitation of carotid PBO led our group to evaluate an alternative management strategy, consisting of endovascular reconstruction of the carotid artery (ERCA) in patients thought to be at particularly high risk for carotid occlusion (ie, provocative balloon test occlusion, angiographic documented incomplete circle of Willis, or contralateral carotid artery occlusion).METHODS: We reviewed all cases of CBS referred to our service, in which ERCA was chosen as a management strategy for patients thought to be at high risk for PBO, based on previously defined criteria.RESULTS: Sixteen carotid blowout events occurred in 12 patients with CBS who were deemed to be at high risk for cerebral ischemic complications, which were managed with ERCA by using a variety of stent devices and techniques. Adjunctive embolization of carotid pseudoaneurysms was performed in five of these patients by using platinum coils or acrylic glue. Hemostasis was achieved in all cases, although one patient with traumatic CBS and three patients with aggressive head and neck cancer-related CBS, required retreatment with ERCA. Recurrent CBS rates were similar to those reported in
other studies using PBO. Overall, no treatment-related strokes or deaths occurred. **CONCLUSION:** CBS managed with ERCA can be performed safely and with efficacy of outcomes at least equivalent to those previously reported in association with conventional carotid PBO, therefore representing an excellent alternative endovascular technique for patients who are at increased risk of stroke after PBO.

**Source:** Medline

Available in fulltext from *American Journal of Neuroradiology* at **Highwire Press**


**Author(s)** Jain R, Marotta TR, Redekop G, Anderson DW

**Citation:** Otolaryngology-Head & Neck Surgery, 01 November 2002, vol./is. 127/5(470-473), 01945998

**Publication Date:** 01 November 2002

**Source:** CINAHL

63. Management of carotid 'blowout' with endovascular stent grafts.

**Author(s)** Warren FM, Cohen JI, Nesbit GM, Barnwell SL, Wax MK, Andersen PE

**Citation:** Laryngoscope, March 2002, vol./is. 112/3(428-33), 0023-852X;0023-852X (2002 Mar)

**Publication Date:** March 2002

**Abstract:** OBJECTIVES/HYPOTHESIS: Since 1992, endovascular techniques for vascular occlusion and stenting have evolved significantly. Endovascular occlusion of the carotid artery has been used in the management of carotid “blowout.” Although it seems logical to expand this application to the use of arterial stents to repair rather than occlude the artery when cerebral cross-circulation is inadequate, concerns remain regarding the placement of a foreign body in a contaminated field. The purpose of the present report is to describe our experience with endovascular stents for control of carotid hemorrhage.

**STUDY DESIGN:** Retrospective case review.

**METHODS:** Retrospective review of three cases of acute or threatened carotid hemorrhage managed with endovascular stent placement.

**RESULTS:** Two patients presented with acute carotid blowout, and one patient with a probable sentinel bleed. All patients previously had been heavily treated with surgery and irradiation: Two had developed pharyngocutaneous fistulas, and one had an open wound filled with tumor that surrounded the carotid artery. All were thought to be at significant risk for stroke if the carotid artery was occluded. In all three patients, stent placement resolved the acute hemorrhage. Mean duration of follow-up was 8.3 months. In two patients, the stent became exposed, ultimately thrombosed or extruded, or both. The third patient had no residual sequelae of stenting but died 3 months later.

**CONCLUSION:** When an unacceptable risk of cardiovascular accident makes occlusion unwise, acute carotid hemorrhage can be successfully managed with directed placement of endovascular stents, but the long-term sequelae of placing these foreign bodies in a field with ongoing contamination make this a temporizing rather than permanent measure for use while more definitive long-term solutions are pursued.

**Source:** Medline

Available in fulltext from *Laryngoscope* at **Ovid**

64. Target-specific multimodality endovascular management of carotid artery blowout syndrome.

**Author(s)** Levy EI, Horowitz MB, Koebebe C, Jungreis CC

**Citation:** Ear, Nose, & Throat Journal, February 2002, vol./is. 81/2(115-8), 0145-5613;0145-5613 (2002 Feb)

**Publication Date:** February 2002

**Abstract:** We describe a novel multimodality endovascular approach to safely control
hemorrhage from a carotid artery pseudoaneurysm and tumor vasculature associated with a squamous cell carcinoma. This approach was used in the case of a 68-year-old man who had previously undergone a laryngectomy, chemotherapy, and brachytherapy and who subsequently experienced acute oropharyngeal bleeding. Angiography detected a carotid artery pseudoaneurysm and significant tumor vascularity. A target-specific multimodality approach was taken to embolize the potential etiologies for both the current and any future hemorrhages. Stent-assisted coiling of the pseudoaneurysm was successful. The tumor blush was treated with polyvinyl alcohol particles and both retrievable and nonretrievable coils. Endovascular surgeons have become increasingly involved in the management of patients with carotid injuries and with neoplasms in and around the skull base. Current endovascular technology provides a rapid target-specific approach to the treatment of carotid artery blow-out syndrome and has a greater potential to lower morbidity than does carotid sacrifice.

Source: Medline
Available in fulltext from ENT: Ear, Nose and Throat Journal at EBSCOhost

65. Delayed carotid artery rupture in advanced cervical cancer - A dilemma in emergency management
Author(s) Witz M., Korzets Z., Shnaker A., Lehmann J.M., Ophir D.
Citation: European Archives of Oto-Rhino-Laryngology, 2002, vol./is. 259/1(37-39), 0937-4477 (2002)
Publication Date: 2002
Abstract: Carotid artery rupture in the setting of advanced carcinoma of the head and neck constitutes a surgical emergency. This report details three such patients, two of whom presented with profuse bleeding, the other with imminent rupture. Notably, our first patient ruptured 27 years after having had radiotherapy for carcinoma of the larynx. This patient had had no previous surgery and at operation no recurrent tumor was evident. In the other two patients, previous surgery had demonstrated tumor invasion of the carotid artery. The choice of therapy in this calamitous condition is controversial, the question being whether to resect and reconstruct or ligate the ruptured artery. Our three patients underwent ligation with no recurrence of bleeding and no neurological sequelae for a follow-up period of 5-36 months. Of paramount importance is the hemodynamic stabilization of the patient prior to being submitted to surgery. Our results favor ligation rather than resection and reconstruction as the procedure of choice in this difficult predicament.
Source: EMBASE
Available in fulltext from European Archives of Oto-Rhino-Laryngology at EBSCOhost

66. Internal carotid artery hemorrhage after irradiation and osteoradionecrosis of the skull base.
Author(s) Lam HCK, Abdullah VJ, Wormald PJ, Van Hasselt CA
Citation: Otolaryngology-Head & Neck Surgery, 01 November 2001, vol./is. 125/5(522-527), 01945998
Publication Date: 01 November 2001
Source: CINAHL

Author(s) Kwok PC, Cheung JY, Tang KW, Wong WK
Citation: Journal of Vascular & Interventional Radiology, July 2001, vol./is. 12/7(895-6), 1051-0443;1051-0443 (2001 Jul)
Publication Date: July 2001
Source: Medline

**Author(s)** Kwok P.C.-H., Cheung J.Y.-L., Kwok Wing Tang, Wong Kan Wong

**Citation:** Journal of Vascular and Interventional Radiology, 2001, vol./is. 12/7(895-896), 1051-0443 (2001)

**Publication Date:** 2001

**Source:** EMBASE

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69. Endovascular treatment of acute carotid blow-out syndrome.

**Author(s)** Macdonald S, Gan J, McKay AJ, Edwards RD

**Citation:** Journal of Vascular & Interventional Radiology, October 2000, vol./is. 11/9(1184-8), 1051-0443;1051-0443 (2000 Oct)

**Publication Date:** October 2000

**Source:** Medline

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70. Acute internal carotid artery rupture (carotid blow out): Emergency treatment by endovascular coil occlusion of carotid artery. A case report

**Author(s)** Cherian M., Prasad Kalva S., Abraham T.

**Citation:** Rivista di Neuroradiologia, 2000, vol./is. 13/4(599-602), 1120-9976 (2000)

**Publication Date:** 2000

**Abstract:** We report a rare case of acute internal carotid artery rupture following radical resection and radiotherapy for an ulcerative carcinoma of the tongue. The patient presented with acute bleeding from the post operative site two weeks following radiotherapy. A surgical pressure bandage was placed and angiography was performed. There was a massive bleed from the ICA once the dressing was removed. The common carotid and internal carotid arteries were occluded with platinum 0.035 coils placed rapidly and the bleeding stopped. As the collateral circulation was good, the patient had no neurological deficits. There are only a few case reports of carotid blow out (carotid rupture) in literature. Most of the cases are treated by either surgery or endovascular detachable balloons. To our knowledge, this is the first case where microcoils were used to treat carotid blow out.

**Source:** EMBASE

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71. Endovascular therapeutic occlusion following bilateral carotid artery bypass for radiation-induced carotid artery blowout: Case report

**Author(s)** Toyoda T., Sawatari K., Yamada T., Kaneko H., Yamashita T., Taniuchi N.

**Citation:** Radiation Medicine - Medical Imaging and Radiation Oncology, 2000, vol./is. 18/5(315-317), 0288-2043 (2000)

**Publication Date:** 2000

**Abstract:** A patient with breast cancer received radiation therapy to the upper chest wall. Twenty-two years later, she presented with repeated severe bleeding through a left lower neck ulcer. She was taken to surgery for hemostasis, which was not successful because the carotid artery was surgically inaccessible. To manage for explosive carotid blowout, we performed common carotid artery ligation and endovascular coil embolization after contralateral-external-carotid to ipsilateral-common-carotid artery bypass with a polytetrafluoroethylene (PTFE) graft. The patient has experienced no ischemic events or bleeding since this treatment.

**Source:** EMBASE
72. Recurrent carotid blowout syndrome: Diagnostic and therapeutic challenges in a newly recognized subgroup of patients

Author(s) Chaloupka J.C., Roth T.C., Putman C.M., Mitra S., Ross D.A., Lowlicht R.A., Sasaki C.T.

Citation: American Journal of Neuroradiology, 1999, vol./is. 20/6(1069-1077), 0195-6108 (1999)

Publication Date: 1999

Abstract: BACKGROUND AND PURPOSE: To our knowledge, recurrent carotid blowout syndrome (rCBS) has not been well described. Our purpose was to review our institution's recent experience with patients who presented with multiple episodes of carotid blowout syndrome (CBS), and who were referred for emergent diagnostic angiography and endovascular therapy. METHODS: We retrospectively reviewed the last 46 consecutive patients who had a clinical diagnosis of CBS. All patients were examined and treated prospectively according to a standardized protocol. Most patients (43 of 46) had undergone extensive primary and salvage radical surgery with intraoperative brachytherapy or external beam radiation or both. The remaining three patients had either traumatic or iatrogenic CBS. RESULTS: Twelve patients (26%) in our series had more than one episode of CBS in which a total of 32 (20 recurrent) events were observed (average 2.7, range 2-4). Intervals of rCBS ranged from 1 day to 6 years. Thirteen (65%) of 20 recurrent events were attributed to progressive disease (PD), and seven (35%) of 20 to treatment failures (TFs). In the PD group, seven (54%) of 13 had recurrent ipsilateral disease, and six (46%) of 13 had recurrent contralateral disease. Etiologies of rCBS were as follows: seven exposed carotids; seven carotid pseudoaneurysms; eight small-branch pseudoaneurysms; five tumor hemorrhages; three hyperemic/ulcerated wounds; and one aortic arch rupture. Twenty-seven of 32 events were treated with endovascular therapy, which included the following: nine carotid occlusions; 11 small-branch embolizations; three transarterial tumor embolizations; one carotid stent; and two direct-puncture embolizations. Four of six TFs were retreated successfully with endovascular therapy; the remaining two TFs were managed successfully by surgery. In the PD group, hemorrhagic complications of rCBS were managed successfully in all but one patient, who died. No permanent neurologic or ophthalmologic complications occurred. CONCLUSION: Recurrent CBS is a frequently encountered problem in which most cases are caused by PD resulting from both multifocal iatrogenic arteriopathy and occasional wound complications that are characteristic of aggressively managed head and neck surgical patients. Initial TFs are encountered often as well. Despite the diagnostic and therapeutic challenges of rCBS, most cases can be retreated effectively.

Source: EMBASE

Available in fulltext from American Journal of Neuroradiology at Highwire Press

73. Percutaneous direct-puncture acrylic embolization of a pseudoaneurysm after failed carotid stenting for the treatment of acute carotid blowout.

Author(s) Roth TC, Chaloupka JC, Putman CM, Ross DA, Weaver EM, Tarro J, Wecht DM, Sasaki CT

Citation: Ajnr: American Journal of Neuroradiology, May 1998, vol./is. 19/5(912-6), 0195-6108;0195-6108 (1998 May)

Publication Date: May 1998

Abstract: We report a difficult case of recurrent carotid blowout syndrome in a patient who had a rupture of the common carotid artery with formation of a large pseudoaneurysm. Conventional management of this emergency, consisting of composite occlusion of the internal and common carotid arteries, was not possible owing to prior clinical failure of balloon test occlusion. This led to an initial attempt to cover the site of rupture with overlapping self-expanding stents, which was only temporarily successful in controlling the hemorrhage. When a subsequent episode of carotid rupture with life-threatening hemorrhage occurred, percutaneous direct-puncture acrylic embolization with temporary flow arrest was used to successfully obliterate the pseudoaneurysm.

Source: Medline
74. Endovascular therapy for the carotid blowout syndrome in head and neck surgical patients: diagnostic and managerial considerations.

Author(s) Chaloupka JC, Putman CM, Citardi MJ, Ross DA, Sasaki CT

Citation: Ajnr: American Journal of Neuroradiology, May 1996, vol./is. 17/5(843-52), 0195-6108;0195-6108 (1996 May)

Publication Date: May 1996

Abstract: PURPOSE: To review our institution's recent experience with patients with carotid blowout syndrome who were referred for emergency diagnostic angiography and endovascular therapy. METHODS: Eighteen consecutive patients who had had surgery for cancer of the head and neck and in whom carotid blowout syndrome had occurred were referred to our service in accordance with a standardized protocol. RESULTS: Twenty-three angiographic pathoetiologic conditions were diagnosed in the 18 patients; the majority of these were pseudoaneurysms involving various segments of the carotid system. Multiple lesions were detected in five patients. Most patients were treated by means of permanent balloon occlusion; in 8 patients with either multiple lesions or impending rupture requiring flap reconstruction, a composite permanent balloon occlusion of the affected carotid system was performed. Hyperacute hemorrhages were arrested in all cases. Hemorrhages reoccurred in 2 cases, and in 2 patients who had permanent balloon occlusion of the internal carotid artery, transient ischemic attacks occurred, which appeared to be related to temporary collateral reserve failure. No permanent neurologic complications ensued. CONCLUSION: Our recent experience with carotid blowout syndrome suggests that this clinical diagnosis represents a heterogeneous group of angiographic pathoetiologies that the physician should evaluate carefully before proceeding with endovascular therapy. Specific endovascular approaches depend on the pathoetiologic mechanism of active or impending hemorrhage and the urgency with which intervention is required.

Source: Medline

Available in fulltext from American Journal of Neuroradiology at Highwire Press

75. Emergency balloon embolization for carotid artery rupture secondary to postoperative infection

Author(s) Hirai T., Korogi Y., Sakamoto Y., Hamatake S., Murakami R., Ikushima I., Takahashi M.

Citation: CardioVascular and Interventional Radiology, 1996, vol./is. 19/1(50-52), 0174-1551 (1996)

Publication Date: 1996

Abstract: Two cases of carotid artery rupture due to postoperative infection were treated successfully with an emergency endovascular technique. A detachable balloon was attached to a 2 Fr microcatheter and was introduced through a 9 Fr guiding catheter. The balloons were detached at the rupture site and just proximal to the lesion. This technique has several advantages over surgical procedures.

Source: EMBASE

76. Postoperative carotid artery rupture caused by actinomyces infection

Author(s) Friedman H.D., Evangelisti P.A., Emko P.

Citation: Otolaryngology - Head and Neck Surgery, 1996, vol./is. 114/1(145-147), 0194-5998 (1996)

Publication Date: 1996

Source: EMBASE

Author(s) Citardi MJ, Chaloupka JC, Son YH, Ariyan S, Sasaki CT

Citation: Laryngoscope, October 1995, vol./is. 105/10(1086-92), 0023-852X;0023-852X (1995 Oct)

Publication Date: October 1995

Abstract: The reported mortality (40%) and neurologic morbidity (25%) rates for carotid rupture remain unacceptably high. This study was conducted to assess the impact of endovascular detachable balloon occlusion and the changing characteristics of carotid rupture in head and neck surgery. Between January 1, 1988, and June 30, 1994, 18 carotid ruptures were identified in 15 patients. Etiologic factors included radical surgery, radiation therapy, wound complications, and recurrent or persistent carcinoma. In 15 of 18 instances of carotid rupture, patients survived without major neurologic sequelae. After the introduction of endovascular techniques in 1991, the 12 patients whose hemorrhage was definitively managed through permanent balloon occlusion survived without significant neurologic sequelae. Endovascular occlusion techniques in the monitored patient may significantly improve the outcome after carotid rupture.

Source: Medline

Available in fulltext from Laryngoscope at Ovid

78. Radiation induced carotid artery blow out: a case report.

Author(s) Gupta S

Citation: Acta Chirurgica Belgica, September 1994, vol./is. 94/5(299-300), 0001-5458;0001-5458 (1994 Sep-Oct)

Publication Date: September 1994

Abstract: Radiotherapy has been associated with various morbid problems. We report a case of large vessel rupture early, after radiation for malignancy of the hypopharynx. The possible etiopathogenesis is discussed with the management of the patient. The case is unusual as the damage to the large vessel is seen soon after the conclusion of the radiation therapy. The aim of the report is to bring forth a radiation associated complication.

Source: Medline

Google Scholar / Microsoft Academic Research

Contemporary management of carotid blowout
J Cohen, I Rad - Current opinion in otolaryngology & head and ..., 2004 - journals.lww.com
Abstract Purpose of review: The purpose of this report is to summarize existing literature with respect to carotid artery blowout and to present an up-to-date algorithm for its management that incorporates recent advances with respect to its diagnosis and treatment. Cited by 45 Related articles All 2 versions Cite

Management of carotid ’blowout’ with endovascular stent grafts
FM Warren, JI Cohen, GM Nesbit… - The …, 2002 - Wiley Online Library
Objectives/Hypothesis Since 1992, endovascular techniques for vascular occlusion and stenting have evolved significantly. Endovascular occlusion of the carotid artery has been used in the management of carotid “blowout.” Although it seems logical to expand this ... Cited by 48 Related articles All 3 versions Cite

Carotid stenting for impending carotid blowout: suitable supportive care for head and neck cancer patients?
G Desuter, F Hammer, Q Gardiner, V Gregoire… - Palliative …, 2005 - pmj.sagepub.com
Background: Carotid blowout (CB) represents a dramatic end-of-life situation for palliative head and neck cancer patients, their relatives and caregivers. Recently, endovascular therapy has been proposed for head and neck surgical patients. Preliminary reports ...

Cited by 18 Related articles All 4 versions Cite

Endovascular management of impending carotid rupture in a patient with advanced head and neck cancer
Abstract Purpose: To describe an innovative endovascular technique combining a flexible self-expanding stent-graft to protect the common and internal carotid artery with selective coil embolization of the affected external carotid artery (ECA) branches. Case Report: A 42 ...

Cited by 16 Related articles All 5 versions Cite

Update on endovascular management of the carotid blowout syndrome
A Mazumdar, CP Derdeyn, W Holloway... - Neuroimaging Clinics of ..., 2009 - Elsevier
Carotid blowout syndrome can be a life-threatening late complication of surgical and radiation therapy for head and neck tumors in the vicinity of the cervical carotid artery. The syndrome spans a spectrum of pathology from impending to acute rupture of the artery. ...

Cited by 8 Related articles All 3 versions Cite

Management of Carotid ???Blowout??? With Endovascular Stent Grafts (Citations: 20)
Frank M. Warren, James I. Cohen, Gary M. Nesbit, Stanley L. Barnwell, Mark K. Wax, Peter E. Andersen

Endovascular management of the carotid blowout syndrome (Citations: 2)
S J Broomfield, I A Bruce, D A Luff, A R Birzgalis, R J Ashleigh
Journal: Journal of Laryngology and Otology - J LARYNGOL OTOL , vol. 120, no. 08, 2006

Endovascular Management of Carotid Blowout: Institutional Experience and Literature Review
Benjamin Zussman, L. Fernando Gonzalez, Aaron Dumont, Stavropoula Tjoumakaris, Robert Rosenwasser, David Hasan, David Cognetti, Rita Axelrod, Pascal Jabbour
Journal: World Neurosurgery

Abstract No. 371: Carotid blowout syndrome: Emergent endovascular management by stenting and/or embolization
J. Tisnado, M. A. Amendola, C. Amendola, C. A. Ehlenberger, W. C. Fox

ORIGINAL RESEARCH Placement of Covered Stents for Carotid Blowout in Patients with Head and Neck Cancer: Follow up Results after Rescue Treatments

Sternocleidomastoid muscle interposition to prevent carotid artery blowout
K. Alok Pathak, Norbert R. Viallet, Richard W. Nason

Diagnosis and Endovascular Surgical Management of Carotid Blowout Syndrome
John C. Chaloupka, Walter S. Lesley, Minako Hayakawa, Shih-Wei Hsu
SP194 – Endovascular management of carotid blowout syndrome
Unknown

Long term outcome of endovascular management of the carotid blowout syndrome in head and neck cancer
Unknown