RESIDENT ABSTRACTS

PRESENTED:
FEBRUARY 5, 2016
Abstract Title: Intermittent Massive Hemoptysis

Abstract Information:

Case Description

This is a 60yo female with history of intermittent hemoptysis, AVR, hemi-aortic arch replacement on anticoagulation that presented for large volume hemoptysis. She was initially treated with empiric pulse dose steroids and plasmapheresis X 5d. She had negative vasculitis workup several times and differential diagnosis at that time was diffuse alveolar hemorrhage (DAH) or pauci immune pulmonary capillaritis. Her initial bronchoscopy was concerning for DAH though localized to right lower lobe as the blood did not clear with serial lavage. She underwent bronchial artery angiography, which did not reveal a structural source of her bleeding. There was concern that there could be a cardiac etiology to her bleeding such as severe MR leading to hemolysis. She had an ECHO, which showed good function of the valves and right heart cath showed normal pressures. On hospital day 9 she had another episode of large volume hemoptysis causing shock and required blood transfusion. She was emergently intubated at that time and another bronchoscopy was done which appeared to localize the bleeding to the superior segment of the left lower lobe. CT angiography supported this location as a source. She was started on an empiric course of plasmapheresis and rituximab to treat presumed vasculitis. On a follow up bronch there were tracheal lesions, which appeared to be benign granulation tissue. Thoracic surgery was consulted for possible segmentectomy, however, they suggested repeat attempt at IR embolization, which was not possible at our hospital so the patient was transferred to the University of Colorado Hospital.

She had another CT angio there that showed a concerning lesion at the area of the aortic arch repair extending from the aortic arch to close proximity to the left lateral tracheal wall. A repeat right heart cath showed a dilated aortic arch with an ulceration at the aortic root repair suture line that may be concerning for possible occluded fistula vs pseudoaneurysm. A pre op bronchoscopy was done which showed a pulsating erosion noted 3cm above the carina on the anterior portion of the trachea. She had surgical repair of the defect. Postoperative diagnosis was direct communication between pseudoaneurysm of distal aortic anastomosis to trachea with ulcer corresponding to this communication within the tracheal wall.

Case Discussion

This case is exceptional because this patient had four discrete episodes of massive hemoptysis secondary to a tracheal aortic fistula. Tracheal aortic fistulas have been reported rarely in the literature in the adult population and the majority of these few cases are of tracheal innominate artery fistula after tracheostomy. The intermittent nature of the bleeding is unique given the connection was with the aorta and you would expect constant flow and life threatening hemoptysis without stopping. There is commonly a sentinel bleed in trachea-aortic fistula but rare to have more than one as they will often be lethal. This case illustrates the importance of recognizing this defect in adult patients and surgical correction of a
fistula in a symptomatic patient. Our patient responded well to appropriate surgical correction of the defect and has had no complications or further hemoptysis even after resuming anti coagulation.

The internal medicine provider can take away a few important points from this case. First there is a broad differential diagnosis for pulmonary hemorrhage that should be worked through in a step wise manner with a pulmonary specialist. It is important to find the etiology of the bleeding, as it could be life threatening in some cases. It is important to always search for the underlying cause and understand the limitations of your knowledge and the abilities of the facility and transfer to a higher level of care if needed.
A 76 year-old male veteran with end stage renal disease (ESRD) with a right upper extremity AV fistula, diabetes, and complete heart block status post pacemaker placement presented with complaints of facial swelling and new onset dyspnea after completion of his scheduled hemodialysis (HD) session. He reported increasing facial and tongue swelling after each HD session over the past month. Prior to this presentation, his symptoms had not been accompanied by dyspnea. He had no new medications and was not taking an ACE inhibitor or ARB. Vital signs were within normal limits. He had right neck and face swelling without stridor or stigmata of respiratory distress. Skin exam did not reveal rash or hives. A portable chest x-ray demonstrated mild pulmonary edema without any. A bedside fiberoptic laryngoscopy revealed mild epiglottic and supraglottic edema. Our patient was admitted to the intensive care unit (ICU) for airway monitoring, given epinephrine, and started on solumederol, famotidine and diphenhydramine and for suspected angioedema. C4, C1 esterase inhibitor (both qualitative and functional) and C1q level were all within normal limits. Patient symptomatically improved with tapered course of corticosteroids. The day after discharge he again developed facial edema and was readmitted. Computerized tomography (CT) scan of neck revealed chronic superior vena cava narrowing surrounding the pacemaker leads with extensive collateralization. On further questioning of patient, symptoms began after being placed in recumbent position during HD. Vascular surgery was consulted and recommended stenting of the stenotic area. He underwent balloon angioplasty followed by placement of a 14mm x 60mm stent from the subclavian vein to the superior vena cava. This resulted in complete resolution of presenting complaints.

Learning objectives
1. Identify differential diagnosis for facial and laryngeal swelling.
2. Recognize SVC syndrome is a rare but possible side effect of pacemaker placement.

Facial and laryngeal swelling is commonly encountered by the hospitalist. The differential diagnosis of laryngeal and facial edema includes angioedema (hereditary, acquired and medication induced), allergic reaction, trauma, mass effect and superior vena cava syndrome. Superior vena cava syndrome is most often associated with a malignancy such as bronchial carcinoma or lymphoma. It is rarely a late complication of pacemaker placement with incidence thought to be 1/3100. The etiology is thought to be induced by endothelial disruption from repeated mechanical trauma by the leads against the vessel wall. In our patient was likely to have this exacerbated during his regular HD sessions as the area was under high. Diagnosis can be made by CT of the chest with the gold standard being contrast venography. Treatment includes percutaneous stenting as in our patient but thrombolysis with a short course of anticoagulation has also been used with success.
Abstract Title: Undiagnosed Patent Ductus Arteriosus Complicating Closure of a Large Ventricular Septal Defect in a 25-year old immigrant with still reversible pulmonary arterial hypertension

Background:

Ventricular septal defect (VSD) and persisting ductus arteriosus (PDA) create a functional left-to-right shunt and are usually diagnosed early in infancy. If left untreated they can lead to pulmonary artery hypertension (PAH), cyanotic disease and Eisenmenger’s syndrome. In cases of significant VSD shunt, a PDA can have low flow and be missed on echo.

A PDA that was unrecognized preoperatively complicated this VSD repair.

Case:

A 25-year old immigrant from Eastern Europe presented with progressive dyspnea on exertion and fatigue. He reported taking digoxin for an unknown heart condition. His exam was unremarkable with the exception of a 4/6 pansystolic murmur. Hemoglobin was 16.3 g/dl with unremarkable CBC and CMP. EKG showed normal sinus rhythm and bifascicular block. CXR revealed an enlarged heart with prominent pulmonary vasculature. Echo showed preserved cardiac function but a large membranous VSD (2 x 3 cm). A Swan-Ganz-Catheter measured PAP of 95/40 mmHg, mean PAP of 56 mmHg, PVR of 205 dyn.s/cm5, SVR of 1465 dyn.s/cm5, CI of 2.5 L/min/m2, and Qp/Qs of 4.5.

After bicaval cannulation, application of cardioplegia and crossclamping of the aorta severe volume overload of the heart occurred despite total cardiopulmonary bypass (CPB). A right atriotomy was performed for a transatrial approach but severe hemorrhage occurred. This situation is characteristic for a PDA, as it allows blood to circulate back from the aorta into the pulmonary artery, left atrium, left ventricle, through the VSD into right ventricle and right atrium while on total CPB. Depending on the PDA size this volume can reach significance and result in inability to unload the heart.

After extremely difficult preparation the PDA was successfully closed with two ligature sutures. Bypass was continued without difficulty. The VSD was closed with a patch without complications. Immediately postoperatively nitric oxide was overlapped with sildenafil and PAP came down to 42/25 mmHg. Further recovery was uneventful.

Conclusion:

Patients with congenital heart disease should be evaluated for PDA by preoperative echocardiogram. If unrecognized preoperatively, it can significantly complicate surgery due to severe hemorrhage while on total cardiopulmonary bypass.
Abstract Title: A Devastating complication of epidural injection for chronic back pain

Abstract Information:

**Introduction:** This is a case of a patient who presented with complaints of back and lower extremity pain with associated weakness and urinary incontinence following an epidural injection for chronic back pain earlier that day.

**Case Description:** The patient is a 69 year old female with a past medical history of coronary artery disease, breast cancer and osteoarthritis who presented to the hospital complaining of back and leg pain with associated lower extremity numbness. She had received an epidural injection earlier the same day for chronic back pain. Of note, the patient has had multiple previous successful therapeutic epidural injections. She was able to ambulate to her car post procedure however noted she had difficulty ambulating out of her car once she arrived home and approximately 20 minutes later reported bilateral lower extremity pain and weakness with associated loss of urinary function. A lumbar MRI was performed as a part of her initial evaluation in the ED. Imaging was initially interpreted by offsite radiology that evening as: severe central stenosis with prominent posterior epidural fat “incidental / non-acute findings.” The ED physician reported these findings to the on-call neurosurgeon who felt it would be appropriate to evaluate the patient the following morning. The initial lower extremity exam by the ED physician does not make any notation of strength deficits however; the admitting physicians noted a left lower extremity strength of 2 out of 5 and a right lower extremity strength of 3 out of 5. The following day the on-site radiologist interpreted the lumbar spine MRI as having a posterior epidural fluid collection that could possible represent an epidural hematoma, 9 mm x 5cm in size from L1-L4 with compression to the intrathecal nerve roots. The patient’s medical team was alerted to the discrepancy. The patient was then taken to surgery for decompressive laminectomy and foraminotomy. Following surgery, she has persistent near total loss of strength in both of her lower extremities and loss of bowel and bladder control.

**Discussion:** Unfortunately this case was complicated both by a delay in diagnosis as well as a known procedural risk. Although the patient has a previous history of successful therapeutic epidural injections for chronic back pain management, the procedure is non-FDA approved with recent studies indicating limited clinical benefits. Given the devastating effects of the complications associated with this procedure and limited benefit in the treatment of chronic back pain, this case calls into question the risk versus benefits for routine use of therapeutic epidural injections.

**References:**


Introduction:

Celiac disease (CD) is a chronic malabsorptive syndrome of genetically susceptible individuals who ingest gluten, which is found in grains such as wheat, rye, and barley. Previously described as a disease of European ancestry, it is believed to affect up to 1% of the general population [1]. Although classically associated with iron deficiency anemia, vitamin deficiencies, and gastrointestinal complaints, the majority of patients with celiac disease exhibit minor or non-gastrointestinal manifestation; however, only a minute number of cases have described the association between celiac disease and cardiomyopathy [2]. We describe a young patient with rapid onset dilated cardiomyopathy in the setting of iron deficiency anemia who was found to have underlying celiac disease.

Case description:

An 18 year old male with a long standing history of severe iron deficiency anemia who presented with fevers, shortness of breath, hemoptysis, and cough. He had originally been seen at an outside hospital and treated for community acquired pneumonia and discharged. Despite treatment, his symptoms continued to worsen, and the patient was admitted 3 days later. Review of systems was significant for palpitations with activity and occasional dizziness. On physical exam, the patient had tachycardia, pallor, cachectic appearance, and an abdominal exam with mild tenderness to palpation on left upper and lower quadrants without guarding. Initial work up showed laboratory findings consistent with iron deficiency anemia and elevated ESR and CRP. Notably, an EKG showed findings of a new left bundle branch block with a prolonged QT interval and non-specific T wave changes while troponins were negative. CT chest imaging revealed pulmonary edema, dilated left ventricle, and cardiomegaly. An echocardiogram showed an ejection fraction of 20-30%. While workups for viral, infiltrative, and rheumatologic etiologies of cardiomyopathy were largely negative, Gliadin IgA and IgG antibody screens were positive, suggestive of celiac sprue. The patient was discharged with instructions to avoid gluten containing foods and was scheduled for GI and Cardiology follow up.

Unfortunately, this writer encountered the patient on the inpatient Cardiology service one year after discharge where he was found to have decompensated CHF with a new EF 10% after failing to follow-up with either GI or Cardiology. He also reported dietary non adherence. He is now on the heart failure team to consider work-up for advanced therapies.

Discussion:

Celiac-induced cardiomyopathy has been infrequently discussed in studies. Many mechanisms for development of DCM due to CD have been proposed: carnitine deficiency due to chronic malabsorption, increased absorption of intestinal infectious agents causing myocardial damage, and auto-immune destruction. Only association between CD and DCM has been indicated in approximately 1-5% of patients [3,4]. A prevalence study in Iran demonstrated a linear relationship of positive anti transglutaminase and age
suggesting that length of exposure may predispose patients to development of antibodies [5]. Based on these articles and cardiology consultation, this Celiac-induced cardiomyopathy was felt to be the most likely diagnosis.

Our case illustrates the importance of determining the underlying cause of DCM as the damage may reversible depending on the diagnosis. The paucity of the data on Celiac-induced cardiomyopathy underscores the difficulty practicing evidence-based medicine (EBM) in a rare disease population. A RCT is unlikely in this or similarly rare populations. This patient required treatment based on case reports alone. This patient’s case demonstrates the imprecise world of medicine that today’s physician still practices in despite the EBM culture.

References:


Abstract Title: Social isolation and Frailty in the Health, Aging and Body Composition Study (HABC).

Abstract Information:

**Background:** Social isolation is a risk factor for many different diseases in geriatric populations including increased hospitalization rates, heart disease, cancer, and mortality. Frailty is a complex syndrome marked by loss of function, strength and physiological reserve in elderly individuals. We evaluated the potential relationship between frailty and social isolation in African Americans (AA) and Caucasians.

**Methods:** Cross-sectional study using the HABC study for all individuals enrolled during the first year of the study (1997-1998). The Lubben Social Network Scale (LSNS) was used to measure social isolation and fatigue and the 400-meter walk test were used to measure frailty. First, the LSNS was categorized into 4 levels based on the commonly used clinical cutoffs. Second, a 2 level categorical variable based on the LSNS cutoff of less than 16, which is considered the most isolated group that we used for bivariate and multivariate analysis. The 400 meter walk test was analyzed for completion as an outcome and as a categorical variable with four levels also based on clinical cutoffs. Multinomial and standard logistic regression to calculate the odds of fatigue or impaired 400 meter walk test results were stratified by race.

**Results:** In bivariate analysis, 400 meter walk speed was significantly slower in socially isolated individuals (321 seconds vs. 317 seconds, p<.001), these isolated subjects were also more likely to report fatigue (9.80% vs. 6.84 %, p<.001). Multivariate analysis included adjustment for age, gender, education, income, marital status, insurance status, presence of depression, and multiple comorbidities. In multivariate analysis of AA using the categorical LSNS as the exposure, the odds ratios and 95% confidence intervals are reported as follows; fatigue (OR 1.04 95% CI .759-1.433, p>.05), the ability to complete the 400 meter walk test (OR 1.13, 95% CI .86-1.69, p>.05) and the 400 meter walk test score (OR 1.12, 95% CI .931-1.34, p>.05.) In multivariate analysis of Caucasians using the categorical LSNS as the exposure, the outcomes are as follows fatigue (OR 0.88, 95% CI 1.58-1.128, p>.05), ability to complete the 400 meter walk test (OR 1.06, 95% CI .83-1.35, p>.05), and the 400 meter walk test (OR 1.06, 95% CI .924-1.297, p>.05.) Using the most isolated group as the exposure, the results of the multivariate analysis for AA are as follows: fatigue (OR 1.71, 95% CI 1.13-2.59, p<.05), the ability to complete the 400 meter walk (OR 1.09, 95 % CI 1.82-1.52, p>.05), the 400 meter walk test (OR 1.03, 95% CI .76-1.33, p<.05). In multivariate analysis of Caucasians using the most isolated group as the exposure, the outcomes are as follows: fatigue (OR 1.33, 95% CI .78-2.26, p>.05), the ability to complete the 400 meter walk (OR 1.16, 95% CI .88-1.5, p>.05), the 400 meter walk test (OR 0.96, 95% CI 1.77-1.21.)
Conclusion: These findings suggest that social isolation may be a risk factor for frailty among well-functioning elderly, especially in African Americans. More longitudinal investigation and awareness of social isolation is needed in the medicine and public health.
Objectives: Community-associated Clostridium difficile infection (CA-CDI) is increasing, and many patients with CA-CDI lack traditional risk factors. In fact, a large number of CA-CDI patients have no previous antibiotic exposure, and they tend to be younger and healthier compared to patients with hospital-associated CDI. However, risk factors for CA-CDI are not well understood. We conducted a retrospective study to determine the clinical characteristics of CA-CDI.

Methods: Patients with potential CA-CDI were identified from a database maintained for infection control surveillance at an urban hospital in Denver, Colorado, between 10/1/2012 and 9/30/2014. Patients were included if they were tested positive for C. difficile. The National Healthcare Safety Network definition was used to define CA-CDI. A chart review was conducted to determine previous antibiotic exposure. Health care contact in the 6 months prior to CDI, including hospital stay, clinic visits, acute care or ED visits, outpatient surgery <24 hr, and observation <24 hr were documented. Clinical details of the acute infection such as severity, laboratory data and other stool pathogens as well as pertinent medications and co-morbidities were recorded.

Results: 152 patients were identified with possible CA-CDI, and 124 patients were included in the study. 28 patients were excluded because of age <18 (1), negative testing (12), deficient medical records (1), previous CDI <8 weeks (5), and recent hospital stay or hospital observation >24hr (9). 54% (67/124) of included patients with CA-CDI were male, and the median age was 53 (IQR 42- 61). Of 124 patients with CA-CDI, 60 patients (48%) had no antibiotic exposure within the previous 6 months. Cephalosporins (3+4 generation) were the most frequently prescribed antibiotics (25/64; 39%), followed by fluoquinolones (24/64; 37.5%). 13% of patients with CA-CDI (16/124) had no health care contact documented in the chart in the 6 months prior CDI. The median number of outpatient visits was 5 (IQR 1-9). 38/124 (31%) of patients were hospitalized within the 6 months prior to the diagnosis (median: 8 days, IQR 4-21). The majority of patients (56%) were treated as inpatient for the acute CA-CDI episode with a median hospital stay of 7 days (IQR 4-11). Only 16/124 required ICU stay.

Conclusion: Almost half of CA-CDI cases had no prior antibiotic exposure although 87% had prior health care contact. Our data suggest that relying on antibiotic exposure to detect CDI may not be sufficient. Further work, including the selection of control patients, may help determine novel risk factors for CA-CDI.
Abstract Title: Trim the FATT: A High Value Care Strategy to Decrease Unnecessary Telemetry Use In Hospitalized Patients

Abstract Information:

Background: Up to 35% of telemetry days in academic hospitals are not guideline-driven.1 The "Choosing Wisely" campaign recommends that non-ICU telemetry usage be avoided, yet no policy governs continuation.2 With costs ranging from $600 to $1400 per day, an opportunity exists for improving value through interventions aimed at increasing guideline-driven telemetry usage.3

Purpose: To decrease inappropriate telemetry use on a medical specialties unit at a tertiary academic medical center through the implementation of an evidence-based decision support tool for telemetry use.

Methods: We conducted structured chart reviews to determine current appropriateness and to identify documented rationale for telemetry use. In addition, we surveyed Internal Medicine (IM) residents on their knowledge of and attitudes towards telemetry. To promote awareness of appropriate telemetry ordering, we developed a high-value care campaign titled “Trim the FATT” (Foley, Access, Telemetry, Thromboembolic prevention). The campaign targeted IM residents, faculty hospitalists, and hospital-based advanced practitioners. The campaign included: (1) Education of attending hospitalists during faculty meetings, (2) Dissemination of pocket cards, which included an evidence-based decision support tool, and (3) A shortcut macro phrase in our electronic health record to improve documentation of telemetry ordering rationale.

Results: 60 IM residents responded to a baseline survey (response rate 35%) prior to the “Trim the FATT” campaign launch. 50 (83%) of respondents were not aware of existing guidelines for telemetry usage and 55 (91%) endorsed ordering based solely on their clinical instincts. A chart review of 62 patients confirmed that there were 69 patient-days of non-guideline driven telemetry over 209 total telemetry days (33% of telemetry days were not evidence-based). Over half of inappropriate use was due to continuation of telemetry past the recommended stop date. A subsequent chart review following the initial “Trim the FATT” campaign launch showed that 5 of 22 patients (22%) remained on telemetry without an identifiable indication.

Conclusion: We developed a high-value telemetry utilization strategy combining education and clinical decision support to enhance appropriate utilization of telemetry on a medical specialties unit. There is a need to deliver evidence-based decision support around telemetry monitoring directly to frontline providers. Inappropriate use of telemetry monitoring likely increases cost of care without any additional benefit to patient care. This initial intervention will inform future improvement cycles to sustain reduction of inappropriate telemetry patient-days.
Abstract Title: The Metamorphosis: One Tumor’s Tale of Transformation

Abstract Information:

Introduction

Patients with MEN1 syndromes have occasionally been found to have neuroendocrine tumors that simultaneously or sequentially secrete different hormones, however each hormone is typically produced by a separate and pathologically distinct tumor. Multiple hormones co-secreted by a single neuroendocrine tumor are exceedingly rare.

Case

A 54 year old woman with a 3 year history of a gastrin-secreting neuroendocrine tumor (gastrinoma) with metastases to the liver, bone, and adrenal glands presented to the Emergency Department with several weeks of intermittent altered mental status associated with dizziness and nausea. On the morning of presentation, she had an episode of seizure-like activity and was found to have a blood glucose level of 20mg/dL during EMS transport. Upon arrival to the hospital, her blood glucose level had risen to 50mg/dL following dextrose administration. Several additional doses of dextrose and a dextrose drip were required to maintain her blood glucose levels above 100mg/dL. She became asymptomatic once normoglycemia was achieved. A pro-insulin level of 99pmol/L, insulin level of 30uIU/mL, and C-peptide level of 3.9ng/mL with a negative sulfonylurea screen and a corresponding glucose of 54mg/dL was consistent with insulinoma. CT imaging of her abdomen and pelvis did not demonstrate the presence of new tumor burden. She was initially treated with prednisone followed by octreotide. She maintained her glucose above 70mg/dL for 48 hours, and both therapies were continued for ongoing treatment at the time of discharge.

Discussion

Insulinomas are thought to arise from the ductal/acinar system of the pancreas. The majority of tumors are benign, but some have malignant potential. The diagnosis of an insulinoma is made when inappropriately elevated insulin levels are found in the presence of symptomatic hypoglycemia. Serum insulin greater than 5uIU/mL, C-peptide level greater than 0.2ng/mL, pro-insulin levels greater than 5pmol/L, and a corresponding glucose less than 55mg/dL are suggestive of the diagnosis. Although the most definitive treatment is tumor resection, diazoxide and somatostatin analogs are reasonable choices in those unable to undergo surgery.
The presence of discrete neuroendocrine tumors that secrete different hormones in the same patient are very unusual, particularly in the absence of MEN1. It is exceptionally uncommon for dual-secretion to occur from the same tumor. Our patient had never undergone testing for MEN1 gene mutations, however, she had no significant family history and no evidence of additional malignancies. Imaging during this admission was not significantly changed from previous, and it was the consensus of oncology and endocrinology that her overall clinical picture was most suggestive of a transformation of her gastrinoma into a co-secreting insulinoma.
**Abstract Title:** Clinic patient presenting with palpable purpura without other organ involvement

**Abstract Information:**

**Introduction:** Leukocytoclastic vasculitis (LcV) is a form of skin vasculitis, secondary to the deposition of immune complexes within small vessels and vascular damage caused by nuclear debris from infiltrating neutrophils. It is associated with multiple diseases processes such as sepsis, autoimmune disorders or medications. In this case, the patient (pt) presented with an unknown cause of LcV that did not resolve after removing the suspected cause. (1)

**Case:** A 67 year old female with past medical history of hypertension (HTN), basal cell carcinoma (BCC), allergic rhinitis, and angioedema secondary to an ace inhibitor presented with one week of pruritic, papular, nonblanchable rash on bilateral legs which subsequently spread to bilateral arms and abdomen. The rash spared palms, soles, and facial regions. Pt recently had a root canal for which she received an unknown antibiotic. Her only other medication was atenolol-chlorthalidone. We identified case reports that indicated both atenolol and chlorthalidone have been associated with LcV. For this reason, the medication was discontinued and no improvement in the rash was noted. Surgical history was only significant for BCC removal. Family history included mother with HTN and asthma and father with lung cancer and HTN. Work up included a CMP, CBC, and an ANA comprehensive panel that were within normal limits. Skin biopsy with direct immunofluorescence showed IgA mediated small vessel vasculitis, consistent with leukocytoclastic vasculitis. Patient was started on prednisone therapy, and her symptoms resolved.

**Discussion:** This case illustrates the importance of considering leukocytoclastic vasculitis in a patient with palpable purpura without other organ involvement, particularly in a patient taking an antibiotic, diuretic, NSAID or anti-hypertensive agent. Ruling out autoimmune conditions or viruses, such as HIV and hepatitis B is crucial in the management of the vasculitis. Treatment consists of removing the offending agent and adding prednisone, colchicine or dapsone if the underlying cause is not due to infection. However, there are no large controlled studies evaluating which treatment options are best or guidelines to dictate therapy. (1)

Paradoxical embolisms can occur when there is a venous thrombotic event that paradoxically travels through a patent foramen ovale. Patent foramen ovale is an anatomic phenomenon that allows passage from the right atrium to the left atrium while bypassing pulmonary circulation. It occurs in approximately 27% of the general population and is usually discovered incidentally only with imaging studies, typically, ultrasound, computed magnetic resonance or computed multi detector tomography. The final location is often thought to be in cerebral vasculature but can also extend to any arterial pathway in the body. Checking for patent foramen ovale remains crucial to understanding clot origin and arterial embolus pathophysiology, and ought to be done when arterial embolus is diagnosed.

A 73-year-old female presented to the emergency room for a cold and pulseless left limb. An arterial ultrasound was performed which demonstrated occlusion at the left popliteal artery. She was taken to surgery and underwent arteriography with embolectomy to follow. One day post operatively, a venous doppler was done for complaints of right leg edema prior to surgery. This resulted in a DVT in the right popliteal, posterior tibial and peroneal veins. Her history was complicated by melanoma diagnosed four years prior for which she had diffuse metastasis to soft tissue, bone and a solitary brain metastasis that was treated with radiation therapy and parietal craniotomy with resection 1 month prior. An echocardiogram with saline bubble agitation was done to evaluate the origin of her arterial thrombus. It was discovered that she had a patent foramen ovale. We suspected that the right deep venous thrombus had paradoxically traveled through the patent foramen ovale and down the descending aorta to cause her left leg arterial occlusion. However, this is only suspected mechanism as we were not able to directly observe passage of clot through her patent foramen ovale. It is possible that the clot could have originated on the arterial circuit given her trousseau syndrome, or hyper coagulability secondary to cancer.

Per hematology/oncology and cardiothoracic surgical recommendations, she was treated on a combination of Aspirin and life long Coumadin with a Lovenox bridge and sent home to follow up outpatient. The risk of surgical closure did not outweigh the benefits, especially given that oral anticoagulation was just as effective and required in her case as she was hyper-coagulable.

This case illustrates the importance of echocardiogram with bubble study for the evaluation of a patent foramen ovale in all diagnosed arterial thrombosis. Given the prevalence of undiscovered PFO, all patients with arterial occlusion should have an echo with saline agitation.
done as it may help determine management, ie life long anticoagulation or surgical closure of the patent foramen ovale. We must not assume that the only location for paradoxical embolus through the superior aortic vessels into cerebral vasculature but rather understand that arterial paradoxical clot destination can be in any distal vessel to the aortic valve.

Sources:


