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Dealing With Drug-Seeking Patients

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by CASEY L. PENN

ON THE COVER 104

Dealing With Drug-Seeking Patients

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PRSA 2019 Prism Award Finalist Printed Periodicals

Kevin St. Clair, MD

Derm Dilemma: Purulent Ulcer

Ashley Ederle, MD;
Kevin St. Clair, MD

A 45-year-old woman presents with a painful, purulent ulcer with a violaceous border on her lower extremity. She reports the lesion first appeared a few months ago as a "tender bump" that rapidly progressed into the lesion pictured below. The patient denies fever, but has experienced vague malaise and mild arthralgias. There has been no improvement noted with over-the-counter topical antibiotics.

Subsequent appropriate step(s) in the evaluation or management of this patient should include:

A. Urgent, aggressive debridement of the lesion
B. Wet to dry dressing changes
C. Silver nitrate application
D. Biopsy of ulcer edge
E. Initiation of anti-staphylococcal antibiotic therapy

Correct answer: D. Biopsy of ulcer edge.

This patient has pyoderma gangrenosum (PG), a sterile neutrophilic dermatosis that most commonly presents in middle-aged adults as a tender papule or vesicle that rapidly progresses into an ulcer with a purulent, necrotic base and violaceous border with surrounding erythema. The diagnosis of PG is one of exclusion; a thorough history, physical, and biopsy are essential to rule out the presence of other diagnostic possibilities, including infection and malignancy. Because of the pathergy phenomenon (inducement of ulceration at the site of trauma or injury), aggressive surgical debridement should be avoided. Approximately one-third of patients with PG exhibit pathergy. Systemic disease is present in over 50% of PG cases, most commonly inflammatory bowel disease, symmetric polyarthritis, or hematologic disorders. Therefore, pertinent history and evaluation regarding the presence of associated comorbidities, if not already known, is critical.

Figure 1.

Treatment for PG depends on severity and whether the lesion occurs independently or in association with aforementioned systemic diseases. Mild PG may be treated with superpotent topical corticosteroids or topical tacrolimus, whereas extensive disease may warrant systemic therapy with cyclosporine with or without systemic corticosteroids, dapsone, mycophenolate mofetil, or tumor necrosis factor-alpha inhibitors. Control of an associated underlying systemic disorder may be accompanied by concomitant improvement in the PG. AMS

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Robert A. Zimmerman, MD, PhD

COMMENTARY

A Veterans Day Salute

On June 28, 1914, Archduke Franz Ferdinand of Austria was assassinated, igniting World War I. The U.S. formally entered the global conflict in April of 1917. As American troops were dispatched to the front lines in the global theatre, obvious harm confronted them. The U.S. Army Medical Corps responded to and deployed to meet this need. Originally established by the Continental Congress in July 1775, it was called the Medical Department. The need for trained medical personnel within the military expanded to the point after the War of 1812 that the first Army "medical school" was proposed and eventually founded in 1893. This program would go on to serve as the origin for today's Walter Reed Army Institute of Research. In 1814, surgeons (the term historically used for all military doctors) in the Medical Department were the first to track and report meteorological conditions, and this systematic reporting of weather data would be the eventual birth of the U.S. Meteorological Service. The Army Medical Corps was officially designated by Congress in 1908 and became formally born out of this patriotic necessity to support America's fighting youth.

Many of our esteemed forefathers of medicine swelled with national pride and rose to support the troops and their country's war efforts by providing medical assistance through the Army Medical Corp stateside, in various base hospitals along the front lines, and in casualty clearing stations. Many of their names are synonymous with the American history of our field, though little is known to us of their service during World War I. The following are a couple of perfect examples.

William Osler, MD, (then enjoying retirement in Oxford, England), is often referred to as the "the father of American medicine," and his wife, Lady Osler, assisted in organizing military hospitals, patient care, and assistance with the Red Cross. Their son, Edward Revere, joined the British Royal Field Artillery's 59th Brigade. Revere was gravely wounded when a German shell impacted close to him, impaling his chest and abdomen with shrapnel and leaving severe wounds. The staff at many of the base hospitals were physicians from top stateside medical schools who were serving their country abroad, "trying to do their bit." The staff at the hospital where Revere was taken summoned Drs. Harvey Cushing and George Crile to operate on Revere. Despite their best efforts, Dr. William and Lady Osler paid the undoubted ultimate price of war when their only child died several days later.

Bacteria was perhaps the biggest foe that any army of this period had to confront, as civilization would not see the utilization of penicillin until 1942 during the era of World War II. London-born physician Henry Dakin rose to the challenge and collaborated with a French-born physician living in the U.S. by the name of Alexis Carrel. Dr. Dakin had developed a hypochlorite solution; he found it to be minimally irritating and retaining antiseptic properties but with a short period of activity requiring instillation therapy. The two physicians met while in New York and later travelled together to the war-zone to a Rockefeller Foundation-supported hospital and research center. Combining with Dr. Carrel's knowledge of early wound debridement and surgical techniques and wound irrigation application, the two are credited with techniques that cleansed and healed many wounds with the then-called Carrel-Dakin wound cleansing irrigation system. Dr. Carrel went on to become active in transplant and culture techniques, and he had a growing interest in human eugenics. Sadly, when World War II broke out, he returned to France only to die in custody as a German sympathizer when the Allies liberated France. Thereafter, Carrel's name was dropped from the lifesaving wound cleansing solution that served as a mainstay for wound care for over 100 years and is still used today, commonly referred to as Dakin's solution.

Dakin's solution and wound irrigation was used heavily, especially during the last several months of the First World War as the Allied forces moved to negate all of Germany's advances. The theory was to pummel the Germans and then let the diplomats talk out a peace agreement. Representatives from Germany met with the Allies from Nov. 8 to Nov. 11 to discuss an armistice; however, continued fighting right up until the last minute of a cease fire resulted in close to 7,000 more deaths and nearly 15,000 more wounded on both sides. This brought the total military casualty count of human history's bloodiest conflict to nearly 8.5 million people.

The signing of the peace agreement with the Treaty of Versailles marked 11 a.m. of the 11th day of the 11th month of 1918 as the official end of the First World War (eerily, the license plate of the car that Archduke Ferdinand was riding in when he was assassinated starting the war was A111118). An American medical officer, Stanhope Bayne-Jones, noted in a letter to his sister the surreal moment when the fighting had ceased:

> *"Our guns had stopped and no shells were coming on us. It seemed mysterious, queer, unbelievable. All the men knew what the silence meant but nobody shouted or threw his hat in the air."*

In 1919, President Wilson proclaimed the first Armistice Day, honoring all those who served in World War I. It became a permanent federal holiday in 1926. In 1954, the 83rd U.S. Congress officially changed the name of Armistice Day to Veterans Day to recognize and honor American veterans of all wars. For a brief number of years starting in 1971, Veterans Day was moved to the fourth Monday in October. It later returned to its original date by President Gerald Ford beginning in 1978.

Veterans Day is set aside to honor and thank living and deceased veterans who have served honorably in the military – during wartime and peacetime. Veterans Day should not be confused with Memorial Day, through which we honor those that have paid the greatest sacrifice for our country – that is, dying in service to their country.

We will again annually recognize all those who have served our country on November 11, 2019, the 101st anniversary of the end of World War I. Pause for a moment to reflect on the role of those who came before us and the great sacrifices they made to provide us with the freedoms we cherish within our democracy. Take time to thank colleagues, family members, neighbors, patients, staff and administrators, and anyone else you may encounter this month who served on behalf of our great United States of America. Your service is greatly appreciated, and we salute you! AMS

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by CASEY L. PENN

Dealing With Drug-Seeking Patients

"It's crazy what some patients will do, don't you think?" said Julio Olaya, MD, AMS member and anesthesiologist specializing in pain management. "Dealing with pain patients, my goal is to diminish the use of opioids wherever possible while alleviating legitimate pain in patients when I can. Sometimes that's easier said than done. You don't know at times who to believe and who not to believe as some patients will lie or fake pain. Some of the performances I've seen are worthy of an Oscar. Others are blatantly ridiculous."

Dr. Olaya spoke at length about his experiences and went on to relay stories about patients trying to work the system. In one instance at one of the pain management clinics where he works, the plumbing system revealed – eventually – that patients were cheating on drug tests. "The drug screen is helpful as a specific way for us to tell if patients are taking the drugs. If they're taking them regularly, they should be metabolizing in their urine. If their drug screen is clear, we know they are not taking them. If they're taking illicit drugs, we can see that also from the drug screen," he said.

Unfortunately, some patients were learning a way around the drug test. "Suddenly, the clinic's plumbing was backing up. We had to call in a plumber. He found tremendous amounts of condoms in the plumbing system. Investigation revealed that dishonest patients were bringing 'clean' urine, whether their own or not, in condoms. They would keep this in their underwear or somewhere on the body to mimic the body's natural warmth. They would pour the urine into the container for the drug screen and then drop the empty condom into the toilet. To remedy this, we began sending a female or male escort in with the patients to be sure this was not happening."

Julio Olaya, MD

Other stories from our members* involve patients showing a different side of themselves beyond the clinic walls, offering to pay cash for pain medications, or far "overselling" their pain levels. Consider the following experiences shared by member physicians.

Case #1 – Jekyll & Hyde

A middle-aged patient, appearing to be physically fit, visited a pain clinic. The patient was not new to the clinic but was seeing a doctor new to the clinic. As the patient waited in the examination room, the attending physician reviewed the patient chart and ascertained that the patient was not advanced in age and was already taking three Oxycodones per day (90 mg daily). Upon opening the exam room door, the physician noticed the patient clearly grimacing and audibly complaining of pain "all over."

When touched in the self-designated pain area, the patient quickly fell nearly to the floor screaming and exclaiming of great pain. This patient's chart documented that other therapies had been tried such as steroids and injections. For this reason, the attending physician believed the patient, who requested a fourth pill daily, and prescribed it (now up to 120 mg daily). Shortly after the visit, the attending physician had reason to leave the building and walk toward his car. He saw in the distance the patient he had just seen, "jumping and laughing and crossing from one stoplight to another."

The attending physician cancelled the prescription before it could be filled and discharged the patient from his clinic. He said, "If I had not gone to the parking lot, the patient would have gotten away with it."

Case #2 – Patient Sold Out by His "Customer"

A neighbor of the patient called the patient's pain clinic to report that the patient was selling his oxys. The call came in the same day the patient in question had been seen at the clinic. The clinic called the neighbor to investigate such a serious allegation. While ascertaining evidence, clinic staff was told that the neighbor's own relative had purchased hydrocodone from the patient. The neighbor also suggested that the patient was, at the time of the call, currently gone to fill the new prescription as evidenced by the line of people waiting outside the patient's home.

The prescribing physician called the pharmacy, who had already dispensed the medication. It came out later that the patient and his spouse were working together as a team to acquire and divert prescription medication.

A Drain on Your Time and Resources

Doctors tend to so much in a normal day – seeing patients, updating medical records, making follow-ups, tending to emergencies, hospital rounds, etc. There's enough to handle without the added responsibility of determining patients' honesty.

"Sadly, we know that some people will go to great lengths to get narcotics for themselves or to divert them for profit," said AMS Executive Vice President David Wroten. "The extra effort that goes into keeping tabs on drug-seeking patients affects everyone. It affects the honest patients who are often required to justify themselves through drug screens and pill counts, or worse, unable to find a physician to care for them. It affects the medical practice through added time and cost of safeguards. It affects physicians, who have become more and more leery of prescribing any narcotics at all for fear of being judged harshly by their medical boards and colleagues."

Newsweek shared an editorial that touched on the effect of drug seekers in the emergency room and their ability to drain vast amounts of time and resources. ("The Drug War Is Wrecking Our ER Departments" 2016/Opinion). "It is not the sheer number of drug seekers that exacerbates what is already a problem of ER overcrowding," wrote Indiana Emergency Physician Geoffrey Hosta, MD. "It is also the ailments that drug seekers … create. They tend to invent symptoms indicative of serious illnesses that offer a quick ticket

IS THE PATIENT DRUG-SEEKING? BE AWARE OF RED FLAGS

Source: adapted from information provided by the Arkansas State Medical Board

Below is a list of "RED FLAGS" for patients who may be exhibiting "drug seeking" behaviors. While compiled from several sources, this is not an all-inclusive list. The Board provides this list as an educational tool for prescribers. Further, it should be used by the prescriber to carefully review their practice for potential problems. Physicians and physician assistants should carefully review the Medical Practices Act regarding the prescribing of controlled substances to make an informed decision regarding prescribing.

RED FLAGS

- Patient reports stolen or lost drugs and has early refill requests.
- Patient has Allergies reported for:
  - » Steroids
  - » NSAIDS (anti-inflammatory drugs)
  - » Acetaminophen
  - » Codeine
  - » Generics
  - » Urine Drug Screens
  - » Positive for Illicit Drugs
  - » Negative for Prescribed Drugs
- Patient refuses or denies to try other drugs or therapy.
- Patient withholds information regarding other medical treatment.
- Patient's admissions regarding alcohol use.
- Patient willing to pay cash only (especially large denomination bills).
- Patient has an extensive knowledge of various pain medicines.
- Patient request is specific with regard to brand, type, combination, and dose of medication.
- Patient does not live in the geographical area of clinic (30-mile radius).
- Patient already being prescribed a combination of benzodiazepine, Soma, and narcotic pain medication.
- More than 20% early on controlled RX refill more than once in past six months.
- More than one prescriber of opioids in the past six months.
- Chronic pain patient less than 45 years of age.
- Physician aware of substance abuse or arrests involving controlled substances.
- Lost or stolen medications more than once a year.
- Patient is taking "uppers" and "downers" at the same time.
- Patient is unwilling to try physical therapy, diet, exercise.
- Timing of acute pain:
  - » Fridays
  - » Weekends

More on recognizing potential abuse:

https://www.deadiversion.usdoj.gov/pubs/brochures/drugabuser.htm

> ***"Sadly, we know that some people will go to great lengths to get narcotics for themselves or to divert them for profit."***
>
> — David Wroten

to the back and the best chance for intravenous drugs. Unfortunately, those complaints require hefty ER resources … Worse still, addicts repeat the trick. One of my drug-seeking patients made 183 visits to my emergency department in a year and visited at least two other emergency rooms. Based on my experience, I estimate that drug seeking accounts for 20 to 30 percent of all ER visits."

An article highlighting health care careers ("Is It Chronic Pain or Drug-Seeking Behavior?" Jul 10, 2019), shared this quote from a frustrated student doctor, who expressed open disdain for those who abuse the health care system to get drugs illegitimately: "I hate you because your fake symptoms force me to throw away millions of dollars of our national treasure on tests that don't need to be done … I hate you because in wasting the time of our ER staff, a harmless grandmother in the room next door must be tied to her bed because there is no sitter."

Incidentally, the article also quoted KevinMD blogger and former EMT Christina Phillips, who spoke of how easy it is for physicians to be disbelieving of patients – that in itself perhaps a roundabout effect of dealing with drug-seeking patient populations. "I still haven't forgotten how easy it is, as a clinician, to see the symptoms first and the patient second, and to reach quick conclusions based on previous experience," Phillips was quoted. "How can I forget, when just months ago I had to help my mother contend with a doctor who, despite the chart in his hand and the eleven-inch scar across her abdomen, refused to believe that she'd had her pancreas removed?"

Another ER physician, Jonathan Reisman, MD, shared his plight in a *Washington Post* article ("Some patients are in pain. Some just want drugs. How do I tell them apart?" March 9, 2018). The article chronicles the story of one drug-seeker whom Dr. Reisman had come to know by name who, normally a drain on his time and the hospital's resources, had shown up to his ER so many times seeking only her next high that when she showed up with a legitimate illness, it was much harder to detect. "The presence of drug-seekers in virtually every physician's practice today has tainted our thinking, casting doubt over clinical instincts to relieve suffering and making us suspicious of pain," said Reisman, whose instincts led him to do several tests on his drug-seeking patient, who turned out to be suffering from a gastric ulcer. "I waver between the emotional tug of agony before my eyes and a rational view of our public health emergency. Sometimes it feels empathetic to give pain meds; other times empathy demands withholding them. Even when convinced that a patient is lying, I'm startled into doubt by a fellow human crying in pain. Nurses have called me cruel; other times, they have shaken their heads at how easily a patient fooled me into giving an opioid. Either choice has consequences."

A Brighter Note

According to one Arkansas ER physician, it's important to note that things are improving over time here in Arkansas. Rep. Lee Johnson, MD, is a regional medical director for Envision Healthcare and works at Baptist Fort Smith and Baptist Van Buren. In addition, he represents constituents in Arkansas District 75. In his 20 years as an emergency physician, Dr. Johnson has seen his share of drug-seeking behavior, but not as much in recent years as he has in the past.

Lee Johnson, MD

"While I can relate to articles I read about drug-seeking behavior, some rely on data from 2010 or before," said Dr. Johnson. "If you'd asked me 10 years ago – even five years ago – about the drug-seeking behavior I'm seeing, I'd have given you markedly different answers. What we used to see is people who had been prescribed significant amounts of opioids from primary care or some other source. They came to the ER because they were running out before they could get their next prescription, and they were trying to come up with a reason to get 10 or 12 of them. It was [most] always hydrocodone.

"I see those patients occasionally, but that's not the overall picture today from my perspective. Thankfully, I don't have a lot of dramatic anecdotes to share. I think it's because the efforts we're putting forth here in Arkansas and nationwide are making a dent in the overprescribing patterns and by extension, the number of patients actively jumping through hoops to get one more prescription or pain shot. There are so many task forces and guidelines being put out on the subject that there's a great awareness of the issue. In addition, the PDMP has provided a little bit of a barrier to prescribing. It makes people think about whether it's worth the effort, and many times, it's not."

We'd Like to Hear from You.

Do you have your own pain-patient stories to share? We want your stories to be the focus of a new series entitled, "Opioid Tales – Games Patients Play." The series will afford you a space to anonymously share your experiences. We hope this will decrease your associated stress and help your colleagues who are dealing with similar challenges. By educating physicians, medical students, and other health professionals through your experiences, we hope also to help eliminate drug diversion and unnecessary prescriptions.

Submit your stories to lhaywood@arkmed.org for possible inclusion in future editions of ***The Journal.*** *(Stories will be relayed anonymously to protect all parties involved.)*

> ***"What we used to see is people who had been prescribed significant amounts of opioids from primary care or some other source."***
>
> — Lee Johnson, MD

As previously reported, Arkansas was one of the first states to develop opioid prescribing guidelines for emergency rooms. AMS-drafted legislation (Act 1208 of 2015) included the guidelines along with other tools put in place to address the opioid crisis.

A Word About Honest Patients

If any good has come from what has been shared, it's the indication that dealing with questionable patient behaviors at times may lead physicians to better understand and appreciate their honest patients. Dr. Olaya noted, "It's easier to recognize a good patient because they comply with everything and are often willing to try some of the good, newer drugs that are less addictive. And we do have better medications, among them buprenorphine and non-deterrent opiates."

Sources & Further Reading

"Is It Chronic Pain or Drug-Seeking Behavior?"

https://www.healthecareers.com/article/healthcare-news/is-it-chronic-pain-or-drug-seeking-behavior

Pain management in primary care: strategies to mitigate opioid misuse, abuse, and diversion.

https://www.ncbi.nlm.nih.gov/pubmed/21474900

Physician assessments of drug seeking behavior: A mixed methods study.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5482434/

"Some patients are in pain. Some just want drugs … The opioid epidemic has forced doctors to become lie detectors"

https://www.washingtonpost.com/outlook/some-patients-are-in-pain-some-just-want-drugs-how-do-i-tell-them-apart/2018/03/09/1c1b66d2-20b7-11e8-badd-7c9f29a55815_story.html

"Opioid Fight" Posted: 6/12/2018

By: David Wroten, AMS EVP, As Printed in the *Arkansas Democrat-Gazette*, Saturday, May 26, 2018

https://www.arkmed.org/news/2018/06/opioid-fight/

*Physician and patient names are removed to protect all parties. AMS

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A CLOSER LOOK AT QUALITY

Targeted Guidance for Infant Sleep Safety Saves Lives

ROSEMARY NABAWEESI, DrPH, MBChB, and CHAD RODGERS, MD, FAAP

"Every time a baby sleeps there is a risk and every time they sleep in an unsafe environment the risk for dying goes up," according to Ben Hoffman, MD, chairman of the American Academy of Pediatrics (AAP).

Almost 4,000 infants die annually from sleep-related causes in the United States.[1] Sudden unexpected infant death (SUID) is the leading cause of infant mortality among children aged 1 month to 1 year.[2] In 2016, 306 babies died in Arkansas before their first birthday; 25% were due to sleep-related causes.[1]

SUID, the sudden, unexpected infant death without obvious cause before an investigation[2] includes Accidental Suffocation and Strangulation in Bed, Sudden Infant Death Syndrome (SIDS) and unknown causes. SIDS is a sudden, unexpected infant death that cannot be explained by scene investigation, autopsy or clinical history review.

Sleep-related deaths have plateaued since the initial decline following AAP's 1992 Back-to-Sleep campaign.[3,4] The National Institute of Child Health and Human Development and AAP revised evidence-based safe sleep recommendations[5] to educate parents, caregivers and health care providers.

The key recommendations are, for the first six months — ideally for a year, back sleeping for all sleep; a firm mattress in a safety-approved crib; no soft bedding, bumper pads, blankets or stuffed animals in infant's sleep area; and sharing parents' bedroom but not parents' bed. Discontinue swaddling by eight weeks of age. AAP does not recommend home cardiorespiratory monitoring due to false positives, cords in sleep environment and a false sense of security. Exceptions are premature infants with recurrent breathing problems, or infants who are technology dependent, have unstable airways or other breathing conditions.

> Almost 4,000 infants die annually from sleep-related causes. Half of all mothers do not receive safe sleep practice advice.

Pediatricians give parents safe sleep guidance as part of routine well-child visits. Burrell demonstrated that counseling varies by sleep domain. Counseling against bed sharing occurred in 15% of well-child visits, but only 25% mentioned "every time."[6] Counseling to remove all objects from the bed and back sleeping occurred in 65% and 83%, respectively. Mothers who reported bed-sharing and items in sleep area were less likely to receive counseling on their infant sleeping alone. Mothers who placed infant on a bed or sofa were less likely to receive counseling on using a crib, playpen or bassinette.

Implementation of recommendations remains suboptimal as illustrated by significant racial and urban health disparities. Black infants are twice as likely to die from SUID as white infants.[7,8] Infant sleep-related deaths are four times higher in rural areas than urban areas.[7] White parents use back sleeping (84%) more than black parents (62%).[9,10] Black

parents are twice as likely to always share an adult bed with infant, compared to white parents.[7]

The 2011–2014 SUID Case Registry classifies 14% of SUID cases as suffocation, attributable to soft bedding (69%), overlay (19%) or wedging (12%).[11] The median age varied by mechanism of death: three months for soft bedding, two months for overlay deaths and six months for wedging deaths. Soft bedding deaths were frequently associated with adult beds (49%), prone position (82%) or blanket obstructing airway (34%). Most overlay deaths occurred in adult beds (71%) and overlaid by mother (47%). In a nationally representative sample of 3,218 mothers at 32 birth hospitals, 65.5% of mothers reported room sharing without bed sharing; 21% reported bed sharing.[12] After adjusting for geographical region, age, birth weight, parity, education and race, receiving advice for both sleep location and breastfeeding practices increased adherence in a dose response manner.

Several studies have shown that barriers to safe-sleep guideline adherence include myths, misinformation from providers and families, attitudes, norms, lack of trust and structural barriers. Half of all mothers do not receive safe sleep practice advice.

Primary care providers (PCPs) should ask about sleep practices and provide counseling specific to risky behavior. Using electronic medical records to administer a safe-sleep practices survey prior to clinic appointment is an effective supplement to a clinician's visit. In a randomized controlled trial in urban newborn well-child visits, African American mothers disclosed significantly more risky sleep practices to a research assistant who asked 18 standardized questions specific to each sleep practice,[13] compared to the pediatrician using routine anticipatory guidance. Having another clinician highlight risky sleep practices allows the pediatrician to provide focused counseling.

Black and low birth weight (LBW) infants have three times the SUID rate as white infants. Black infants have higher rates of prematurity and LBW. Within each racial group, the SUID rate increased progressively with decreasing birth weight at 16.4 per 1,000 black infants and 5.5 per 1,000 white infants; 27% of the black/white SUID disparity can be explained by blacks' higher LBW rate.[14] Blair demonstrated that 54% of 80 SIDS deaths occurred while co-sleeping in the intervention arm. He determined that excess deaths resulted from the interaction between alcohol, drug use and co-sleeping.[15]

The National Action Partnership to Promote Safe Sleep recommends three interventions: awareness, reinforcement and problem solving. For PCPs to reinforce safe sleep practices, they need current and accurate knowledge about guidelines and ability to answer questions with consistent and standardized messaging, individualized for each family. ▲

Dr. Nabaweesi is assistant professor, Dept. of Pediatrics, UAMS and ACRI; Dr. Rodgers is chief medical officer, AFMC.

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Subcutaneous ICD

**Kanishk Agnihotri, MD; Sabeeda Kadavath, MD;
Anil Kumar Jonnalagadda, MD; Hakan Paydak, MD**

Abstract

Since their initial introduction, implantable cardiac devices (ICD) have been increasingly utilized in medical practice. Implantation of an ICD is recommended for the primary prevention of sudden cardiac deaths (SCD) due to life-threatening ventricular arrhythmia in patients who have received optimal medical management yet remain at high risk of SCD and at risk for the secondary prevention of SCD due to life-threatening ventricular arrhythmia.

Leadless Cardiac Pacemakers (LPM), Subcutaneous Implantable Cardioverter-Defibrillators (S-ICD) and Wireless Cardiac Stimulation Systems (WiCS) are devices that function as their conventional predecessors, but with the advantage of not requiring a trans-venous lead thus minimizing the various complications associated with lead insertion. S-ICD consists of a subcutaneous unit and a shocking coil that does not go through the venous system. Encouraging data has been published regarding its efficacy and function; however, the lack of pacing function and the non-applicability of cardiac resynchronization therapy mode makes it harder for electrophysiologists to choose the device over conventional models.

Introduction

Cardiac arrhythmias are the most common causes of sudden cardiac deaths (SCD) worldwide, accounting for 50% of cases.[1] ICDs have shown great applicability and impressive results in decreasing mortality in SCD in selected patients.[2] The first implantable cardioverter-defibrillator (ICD) was done in 1980 by Doctors Michel Mirowski, Morton Mower, and William Staewen.[3] The Subcutaneous-ICD (S-ICD) studies show encouraging results regarding short-term complications, although there are many limitations that prevent its use in all patients.

Since its introduction, the use of S-ICDs has been rapidly increasing in the U.S. Early use has been associated with low short-term complication rates and high rates of successful defibrillator threshold testing (DFT) despite frequent use in patients with a high number of comorbidities. Their use has increased from 0.2% to 1.9% of all ICD implants over the initial 2.5 years of availability.[4]

Components

The S-ICD consists of a pulse generator unit implanted in a subcutaneous pocket in the left mid-axillary thoracic position and a subcutaneous lead, which goes from the generator to the left parasternal margin, with an 8 mm shocking coil.[5] The lead has two electrodes, the proximal lies above the xiphoid process, and the distal at the sternal notch. Cardiac rhythm is detected between those two electrodes or between one of them and the pulse generator.

The DFT is usually set to 65 joules, which is an adequate safety margin; however, the S-ICD can provide up to 80 joules. The device delivers an 80-joule shock for defibrillation of ventricular tachy-arrhythmias including monomorphic ventricular tachycardia (VT), polymorphic VT, and ventricular fibrillation (VF). If a VT or VF persists following the initial shock, the device will reverse polarity between the electrodes and deliver subsequent shocks. The S-ICD will deliver a maximum of five shocks for a single episode of a ventricular arrhythmia. If more than 3.5 seconds of asystole occurs following a shock, the S-ICD can deliver 30 seconds of demand pacing at a rate of 50 beats per minute. During an event, the S-ICD will store the electrocardiogram (ECG) tracing for subsequent review.[6] The implantation time is about one hour and can be done with anatomical landmarks only without fluoroscopy guidance, since there is no TV lead insertion[6]; it is, however, dependent on the skill and the speed of the interventionist.

Indications & Contraindications

Although S-ICD was developed to overcome the complications of TV systems, it cannot function as a pacemaker or a CRT device. Since a large percentage of patients requiring ICD tend to develop indications for CRT or pacing, S-ICD may not be the best long-term option for them. In a retrospective study with 1345 patients who required ICD placement, 63 patients (34%) received anti-tachycardia pacing as a therapy or developed an indication for ventricular pacing, or CRT, which cannot be performed using the S-ICD.[7] However, this can be overcome with proper patient selection from the start.

S-ICD maybe considered in patients with complex venous access, since it does not require inserting TV leads, or in patients with a high risk of bacteremia or infective endocarditis. It can also be used in younger patients with HOCM or channelopathies so as to avoid long-term lead complications and because of the expected longevity of the implanted electrode.[8] S-ICD can also be used concomitantly with a conventional pacemaker.[9]

S-ICD is not the best choice in patients who require brady-arrhythmia pacing or anti-tachycardia measures as VT or VF, as the device has not been designed to address these problems. The same is true for patients who require biventricular pacing for CRT.[8]

Obtaining a baseline ECG with identifiable T waves is crucial to avoiding over sensing and inappropriate shocks; some patients are not eligible because they have large or late T waves, which can cause unnecessary shocks.[10]

Evidence-based studies

Since its introduction into practice, major studies have evaluated the efficacy and outcomes

of S-ICD. In a study of 49 patients who received both a temporary S-ICD and a trans-venous ICD (TV-ICD), an entirely subcutaneous ICD consistently detected and converted ventricular fibrillation induced during electrophysiological testing. Over four months of follow up, the device also successfully detected and treated all 12 episodes of spontaneous, sustained VT; however, it required higher energy for successful defibrillation.[6] Adverse events in this study included two pocket infections and four lead revisions.

In another prospective, nonrandomized, multicenter trial, 321 patients with no pacing requirement and no documented episodes of pace-dependent ventricular tachycardia underwent S-ICD implantation and were followed for 11 months. The primary endpoints were related to six months' complications and induced ventricular arrhythmia conversion among patients who completed the DFT testing protocol. Both primary end points were met: the six months' system complication-free rate was 99%, and analysis of the acute ventricular fibrillation conversion rate was >90% in the entire cohort. There were 38 discrete spontaneous episodes of ventricular tachycardia/ventricular fibrillation recorded in 21 patients (6.7%), all of which successfully converted. Forty-one patients (13.1%) received an inappropriate shock.[11]

Pooling of data from the EFFORTLESS S-ICD Registry and the IDE study resulted in a cohort of 882 patients, followed for an average of 1.8 years. 111 episodes of VT/VF were documented in 59 patients, with successful arrhythmia termination in 90% of patients following one shock and 98 percent within five shocks.[12,13]

Advantages & Disadvantages

The design of the S-ICD makes it superior to the conventional ICD; absence of TV leads avoids some of the complications associated such as cardiac perforation, hemothorax, lead infection or lead failure. Also, the lead is not exposed to the hostile environment of the myocardium; hence, it is less subject to lead failure.[14] Inappropriate shocks are a major drawback,[6] mostly due to T wave abnormalities, hence it's crucial to choose patients carefully without abnormal T waves (vide supra). During follow up of 581 patients, inappropriate shocks mainly due to cardiac over sensing occurred in 8.3% of the S-ICD patients. Patients with hypertrophic cardiomyopathy or a history of atrial fibrillation are at increased risk, warranting closer attention to the sensing and programming function of the device in this population.[15]

Moreover, pocket infection has been noted to happen in 1 to 10% in various studies.[6] Lead dislocation can happen as well with dislodgement thought to result from vigorous physical activity occurring without adequate fixation of the parasternal lead, requiring repositioning.[6,15] In most patients, suture sleeves are now utilized to fix the proximal segment of the parasternal lead, a technique that has essentially eliminated lead dislodgement and migration.

Battery life is also a concerning issue. In the START (Subcutaneous versus Trans-venous Arrhythmia Recognition Testing) trial, in the cohort of 55 patients with S-ICD who were followed for a median of 5.8 years, 26 patients (47%) underwent device replacement, with 25 of 26 patients requiring replacement for battery depletion.[16] Unfortunately, since there are no long-term studies available, this cannot be measured accurately. This trial compares the sensing performance of the S-ICD with that of standard TV-ICDs in 64 patients. Both S-ICD and TV-ICD devices successfully detected 100% of ventricular arrhythmias; discriminating supraventricular tachycardias (SVT) from ventricular tachycardias (VTs) (98% S-ICD versus 76.7% for single-chamber TV-ICD versus 68% for dual-chamber TV-ICD.[16] The PRAETORIAN trial, a multicenter, randomized trial studying 700 patients, directly compares S-ICDs with TV-ICDs and is powered to prove non-inferiority of the S-ICD, with the primary endpoint being inappropriate shocks and ICD-related complications along with secondary endpoints of shock efficacy and patient mortality.[17]

Future

Subcutaneous Implantable Cardioverter-Defibrillators have shown promising results. It is clear that as the learning curve increases, the complication rate decreases. More studies are needed to further evaluate these novel measures and to better incorporate them in practice guidelines for SCD prevention.

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Lead Toxicity Resulting From a Retained Bullet Fragment:

Case Report and Review of Relevant Clinical Considerations

Steven A. Dunnagan, MD

Diplomat, American Board of Medicine; Diplomat, American Board of Radiology; Fellow, American College of Radiology;
Staff Radiologist, Radiology Associates, P.A.; Little Rock Staff Neuroradiologist, Interventional Radiologist, St. Vincent Infirmary Medical Center, Little Rock

Introduction

Lead poisoning related to retained bullet fragment(s) (RBF) has been widely reported in the medical literature. Lead fragments in joints have long been known to be associated with the development of lead toxicity, and RBFs in serous cavities, or CSF spaces, are also likely to produce toxic serum lead levels. Lead toxicity due to an RBF in bone has been rarely reported in adults, and usually in the setting of concomitant joint exposure. Presented here is a case of lead toxicity diagnosed in an adult resulting from RBF embedded in a rib 13 years after the gunshot wound. The article includes a brief review of literature relevant to the clinical presentation and management of RBF-related lead toxicity, with recommendations for managing patients with RBFs based on reported cases.

Patient History

A 33-year-old black male presented to the emergency room with one-day history of severe generalized abdominal pain. He had previous episodes of similar pain for which medical care was sought but prior evaluations had not revealed a specific diagnosis. No fever, nausea, vomiting, diarrhea, rectal bleeding, or focal abdominal tenderness was reported. Patient was on phenytoin for seizure disorder and reported no other medical problems. There was history of gunshot wounds 13 years previously to the left chest and right buttock that were not life threatening, but patient also sustained blunt trauma to the head at that time requiring hospitalization with subsequent development of seizure disorder. There was no history of renal failure, refractory anemia, or evidence of cognitive decline. Formal cognitive testing was not performed. Electrolytes, creatinine, and glucose were normal. White blood count-11.9, Hematocrit-38.7, Hemoglobin-13, plt-144 – all within normal limits. Blood smear showed no abnormality of red cells. Chest x-ray and KUB were obtained and revealed no specific visceral abnormality. Retained bullet fragments were present in the right buttock and left tenth rib. On comparison to a chest x-ray from 19 months previous, it was noted that the RBF lodged in the left tenth rib showed a change in configuration with new radiographically dense "blooming" around the fragment. Blood sample was obtained for serum lead level that was reported as 78mcg/dl (normal =0mcg/dl, toxic >10mcg/dl). Surgical consultation was obtained. The position of the RBF was felt to be optimal for surgical removal as the primary therapy. At surgery, the bullet was encapsulated in the tenth rib. The fragment was locally excised without rib resection and the cavity was thoroughly rinsed. The patient recovered uneventfully. No postoperative medical therapy was initiated. Postoperative lead level fell to 36 mcg/dl and no medical therapy was felt necessary. Patient will continue regular monitoring of serum lead levels with no additional treatment planned at the time of this writing.

Discussion

The Centers for Disease Control reports 115,000 gunshot wounds occurred in the U.S. in 2015, of which 70% were non-fatal, a statistic indicating a substantial and growing population at risk for RBF-associated lead toxicity. While not all gunshots result in RBFs, and most RBFs do not result in systemic toxicity, the CDC indicates that the prevalence of this entity is probably under-reported due to the nonspecific symptoms it produces, the potentially long period of time between the original gunshot and development of symptoms, low index of suspicion by examining physicians, and reluctance of patients to discuss an old gunshot injury or realize its potential importance.

Recent reports indicate that there may not be any anatomic location in which an RBF cannot produce toxicity given enough time. RBFs in contact with synovial fluid are well documented and widely accepted to produce toxic systemic lead levels in adults. Toxicity has also been reported for bullets in contact with CSF, pleural space, and peritoneal cavity. Lead fragments embedded in bone are not as well documented to produce systemic toxic lead levels, but may have local adverse affect on bone healing in animal studies. RBFs embedded in soft tissues have traditionally been thought to be innocuous and better left alone, but a case of toxicity resulting from an extremity gunshot injury without bone or joint involvement has been reported. As a result of the diversity of RBF locations producing lead toxicity, it is reasonable to state that any RBF may lead to systemic lead toxicity and physicians should be vigilant for this possibility.

Traditional recommendations for managing RBFs have focused on pain, bullet migration, joint involvement, and infection as the primary considerations for removal. Rhiel et al[2] also recommend removal of RBFs in the palm of the hand or sole of the foot. Some authors have recently included potential for systemic lead toxicity as a consideration, but guidelines for removal of RBFs from structures other than joints are subject to debate, and risk-versus-reward considerations for surgical extraction of RBFs remain a clinical challenge. In addition to the above recommendations, a change in the x-ray appearance of an RBF as noted in our case has also been mentioned as an indication for serum lead testing and consideration of surgical removal. Fortunately, serum lead level testing is a reliable, widely available, and relatively inexpensive test that can be employed in a surveillance program for patients whose RBFs have low risk of lead toxicity, or for whom RBF location or fragmentation may make RBF removal unsafe or impossible.

Adult patients with lead toxicity present most commonly with abdominal pain. Anemia (microcytic, hypochromic, with basophilic stippling of red cells), neuropsychiatric symptoms, and renal insufficiency may also have developed by initial presentation. Symptoms develop insidiously, are non-specific, and are relatively common in medical practice. Patients may make several medical visits before the diagnosis is made, and it is likely that there are many undiagnosed cases with mild or misleading symptoms.

Although death is not commonly reported, the most common cause of lead-toxicity-related mortality is progressive encephalopathy. This should be considered a cause for emergent treatment, including immediate initiation of chelation therapy with

RBF removal if possible. Hemodialysis has been employed in treatment of acute lead encephalopathy, but efficacy has not been established.

Elevation of serum lead levels may occur within the first week of injury but is usually delayed by many years. While the half-life of serum lead is around 30 days, in bone it ranges from two to 30 years. Bone may act as a lead reservoir and allow toxic serum levels to recur even after bullet removal and successful lowering of serum lead levels by chelation therapy. Physiologic stresses such as sepsis, hyperthyroidism, hypermetabolic states, lactation, and pregnancy may cause mobilization of lead deposited in bone with resultant spike in serum lead levels. Pregnancy is a particular concern, as the placenta presents no barrier to fetal lead exposure.

Confirming lead toxicity is relatively straightforward. Serum lead level determination is widely available (in part due to the efforts to reduce toxic environmental lead exposures in adults and children), inexpensive, and requires a blood sample (Blood Lead Level, or BLL). The blood sample may require special handling, so consultation with the testing laboratory is recommended. The normal level for lead in humans is 0 mcg/dl. There is no "safe" level, as persistent low serum levels of lead may result in significant bone accumulation over time that may produce toxic serum levels in some stressful circumstances. Clinical toxicity may develop at levels as low as 5 to 10 mcg/dl and levels over 10mcg/d are always considered to be in a toxic range. In general, RBFs produce higher serum lead levels than occupational or environmental exposures. Erythrocyte-free protoporphyrin has also been used in detecting toxic systemic lead levels, but is not felt to be as sensitive or accurate as serum testing.

Once a toxic level is confirmed, removal of the offending RBF may be sufficient treatment. Chelation therapy with dimercaptosuccinic acid (DMSA) or Ethylenediaminetetraacetic acid (EDTA) is recommended for lead levels greater than 45 mcg/dl. Chelating agents are relatively contraindicated in patients with severe renal or liver disease. The most common side effect of DMSA is skin rash. EDTA may be associated with anemia and arrhythmia. Clinically significant reduction in levels of magnesium, calcium, iron, and potassium may also occur. Chelation agents are excreted in urine so dose adjustment may be necessary in cases of renal insufficiency and in patients on dialysis. Monitoring of renal and hepatic function is recommended in patients receiving chelation therapy.

Successful reduction in lead levels and clinical symptoms has been reported in patients receiving chelation therapy without RBF removal. Successful therapy should be followed by regular surveillance due to the possibility of recurrence of toxic lead levels related to mobilization of osseous lead deposits.

CONCLUSION

Systemic lead toxicity resulting from retained bullet fragments is rare, but probably more prevalent than currently understood due to non-specificity of symptoms and because it is unknown to many practitioners. Lead toxicity in an adult resulting from a bullet fragment in bone without joint exposure is very rare. A recently encountered case of systemic lead toxicity in a patient with remote gunshot wounds is presented with favorable early response to removal of the bullet without medical therapy. Discussion includes survey of relevant literature and recommendations for diagnosis and treatment. It is important to understand that while bullet fragments in certain locations (joints, fluid spaces) are more frequently associated with lead toxicity than others, any retained fragment has the potential for producing lead toxicity. It is hoped that this report will enhance physicians' knowledge of the presenting symptoms of lead toxicity, promote awareness of the possibility of lead toxicity in a patient with a retained bullet fragment, and increase diagnostic testing for RBF-related lead toxicity in appropriate patients.

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IMPORTANT FACTS AND RECOMMENDATIONS FOR PATIENTS WITH RETAINED BULLET FRAGMENTS

- » Lead toxicity from retained bullet fragment is rare, buy may develop from bullets in any anatomic location.
- » The population at risk for RBF lead toxicity is growing.
- » Patients with RBFs may develop toxic lead levels within a month of the injury, or it may occur decades later.
- » Some locations (joints, synovial spaces, CSF, serous cavities) may be more prone to development of RBF-related lead toxicity; bullet removal should be considered for these locations regardless of lead level.
- » There is no official published guideline for serum lead monitoring in patients with RBFs. Those in whom RBFs cannot be safely removed should have regular serum lead levels checked at intervals appropriate to the risk level (high risk every 1 to 2 years, low risk every 5 to 7 years.)
- » Chelation therapy can be effective even if the RBF cannot be removed.
- » Toxic serum lead levels may recur in patients after successful RBF removal and treatment, so continued surveillance is warranted.
- » The most common presenting symptoms of adult lead toxicity are abdomen pain, anemia, and renal insufficiency. A less common, but more serious symptom is progressive encephalopathy, which may be fatal. Lead toxicity should be considered in patients presenting with any of these symptoms when they are unexplained by more common etiologies.

CASE STUDY

Meningoencephalitis Caused by Varicella Zoster Virus Despite Proper Immunization

Joseph Hunter Holthoff, MD, PhD;[1] Barrett J. Burger, BS[1]; Philip Doerner, DO; Sridhar Enuganti, MBBS;[1] Trevor J. Johnson BS;[1] Robert H. Hopkins, MD[1]

[1]Department of Internal Medicine and Pediatrics, UAMS, Little Rock

Abstract:

Varicella-zoster virus (VZV) causes both a primary infection and secondary infection due to virus reactivation. VZV reactivation is typically seen in immunocompromised patients but has also been reported in immunocompetent patients.

We present two cases of varicella-reactivation meningoencephalitis with atypical presentations. Both presented with fever, headache, and malaise but not the characteristic vesicular zoster rash. The diagnosis was confirmed via positive polymerase chain reaction detection of virus in the cerebrospinal fluid. While both patients had been vaccinated against VZV (Zostavax®), our first patient had received an allogenic bone marrow transplant, and our second had a history of ulcerative colitis.

Introduction

Varicella zoster virus (VZV) is the most common infectious cause of both central and peripheral nervous system disorders.[9] Primary VZV infection spreads throughout the body via the bloodstream, causing chicken pox in children, after which the virus remains latent in ganglia of the central nervous system (CNS).[5] With increasing age there is a resultant decline in cell-mediated immunity, allowing the virus to directly invade the neuronal and glial cell bodies. The immune response to this invasion produces the characteristic vesicular skin lesions and neurological damage classically seen with zoster reactivation. Other manifestation of zoster reactivation can include meningoencephalitis, cerebellitis, postherpetic neuralgia, severe necrotizing myelitis, polyneuritis cranialis, leukoencephalopathy, and ocular disease.[8,4] Impaired cell-mediated immune response also contributes to the VZV-related pathologies, such as acquired immunodeficiency syndrome (AIDS) or human immunodeficiency virus (HIV) infection, those receiving immune suppressing agents, and both the young and elderly populations. It is important to recognize that some patients present with neurological symptoms before any cutaneous manifestations are observed.[4]

VZV is a common cause of meningoencephalitis and is likely underestimated in frequency.[1] Currently, the gold standard for diagnosis of VZV meningoencephalitis is amplification of viral DNA in cerebrospinal fluid (CSF) by polymerase chain reaction (PCR). With the increased utilization and capabilities of PCR, causative agents for meningoencephalitis are more readily identified. The most common viruses identified include herpes simplex virus-2 (HSV-2), enterovirus, and VZV.[2] Most studies have identified HSV-2 as the most common viral etiology of meningoencephalitis, although others have suggested the incidence of VZV meningoencephalitis could be more common.[3]

Case reports

Patient #1: Our first patient was a 73-year-old Caucasian male with a history of large B-cell lymphoma with CNS involvement (underwent autologous bone marrow transplant [BMT] in 2012) and Parkinson's disease. He was vaccinated with Zostavax® approximately two years prior to BMT and six years prior to presentation. He presented to an outside hospital with headache, fever, confusion, and worsening tremor for three days. He denied rash, recent sick contacts, or travel.

The patient was started empirically on antibiotics (vancomycin, doxycycline, and ceftriaxone), as well as antiviral therapy (acyclovir). Basic laboratory analysis, including a complete blood count (CBC), basic metabolic panel (BMP), hepatic panel, urinalysis (U/A) with culture, and blood cultures revealed no significant abnormalities. Computerized tomography (CT) head without contrast and magnetic resonance imaging (MRI) brain without contrast (Figure 1) were both negative for acute process. A lumbar puncture (LP) was performed and CSF analysis revealed lymphocytic leukocytosis (303 WBC, 74% lymphocytes). Glucose (60 mg/dl) was normal and protein levels were mildly elevated (110 mg/dl). Some atypical leukocytes were noted in CSF, but flow cytometry of CSF was negative for recurrence of malignancy. PCR was performed and detected 477,000 copies/ml of VZV (Table 1). At that time, antibiotics were stopped, and acyclovir was continued to complete a 21-day course. His hospital course was complicated by acute kidney injury, attributed to crystal nephropathy from acyclovir toxicity, which improved with intravenous fluids. He clinically improved and was discharged on hospital day 16 to complete therapy at home. He recovered to his premorbid functional level with this treatment and remained well six months following this illness.

Patient #2: Our second patient was a 72-year-old Caucasian male with history of inflammatory bowel disease (not receiving treatment at time of presentation) who initially presented to the clinic with fever, headache, and malaise for two days. Physical examination was unremarkable. He was discharged from the clinic at that time with diagnosis of a likely viral illness.

Ten days later, he suffered a generalized tonic-clinic seizure while driving and was admitted to an outside hospital. At the time of admission to outside hospital he reported persistent fevers during those 10 days. He denied rash or recent tick bites, but did report sick contacts with similar symptoms. He was started empirically on intravenous doxycycline and acyclovir. Laboratory analysis showed a normal CBC, hepatic panel, and U/A, but were remarkable for lactic acidosis (9.5 mMol/l) and hyponatremia (126 mMol/l). Blood and urine cultures revealed no growth. CT head without contrast and MRI brain with and without contrast were negative for acute pathology. LP was performed, and CSF analysis showed predominantly lymphocytic (79%)

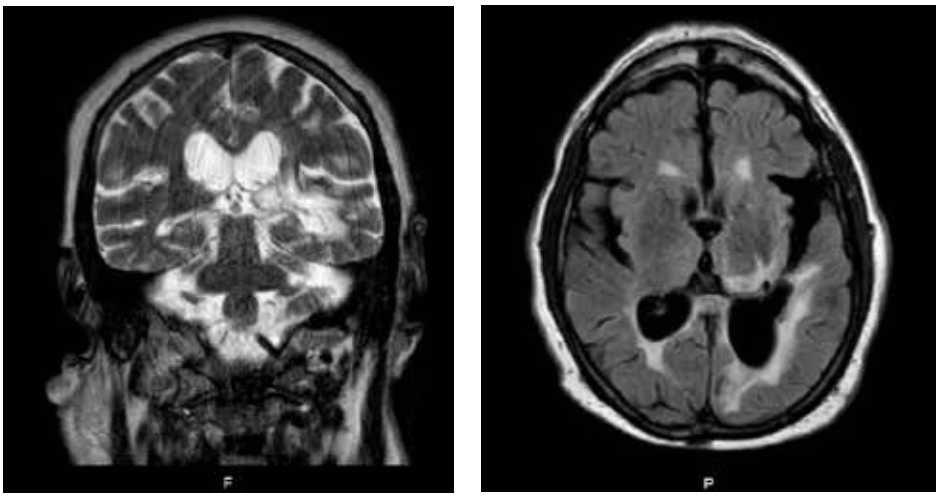

Figure 1: Magnetic resonance imaging of brain of Patient #1 showing stable surgical and post-radiation treatment related changes, without evidence of acute process or recurrent malignant disease.

leukocytosis (328 WBC), elevated protein (224 mg/dl), and normal glucose (44 mg/dl). The patient clinically improved and was discharged to home on day three with 21-day course doxycycline. Following discharge, PCR analysis of CSF detected VZV and patient was started on oral valacyclovir to complete a 21-day course (Table 1). Patient continued to improve with no further complications, returned to his normal premorbid functional level, and remains so at the time of the preparation of this manuscript.

Discussion

VZV reactivation is a common problem affecting approximately 1,000,000 patients annually in the U.S.,[18] and the incidence dramatically increases in patients over 60 years of age,[17] HIV-infected patients[21], BMT recipients,[22] and patients otherwise immunosuppressed[24] (i.e. immunosuppressed inflammatory bowel disease patients[23]). The most frequent presentation of VZV reactivation among this patient population is herpes-zoster, or "shingles," characterized by a painful vesicular rash affecting a single dermatome. Rarely, VZV reactivation affects the CNS, with an estimated incidence of three cases in 100,000; cases result in significant morbidity and mortality.[15]

A recent, retrospective study of elderly patients with viral meningoencephalitis, of which VZV was the most commonly identified organism, showed mortality as high as 20% and long-term neurological impairment in up to 40% of patients.[15] Patients with VZV reactivation affecting the CNS present a diagnostic challenge as they may display only non-specific neurologic symptoms, including altered mental status and seizure activity, and often lack the classic rash.

Weerkamp, et al. describe two patients with progressive headaches, vomiting, and altered mental status. Both patients in this series lacked nuchal rigidity, fever, skin lesions, or elevated WBC. LP revealed typical viral infectious results and positive PCR detection of VZV.[1] Sugisaki and Yoshida report a case of VZV meningoencephalitis in a 75-year-old immune-competent patient who complained of fever, headache, nausea, mild ataxia of the lower extremities, memory loss, and skin lesions appearing over the prior two weeks. This patient also had negative imaging with unremarkable laboratory analysis. LP revealed a similar viral differential as well as a positive VZV PCR.[5] Both patients presented in this report lacked the classical features and presented only with non-specific neurological symptoms, which highlights the need for a heightened clinical suspicion of VZV meningoencephalitis, even in the absence of the classical vesicular dermatomal rash, as studies have shown improved clinical outcomes with early administration of anti-viral therapy.[16]

A vaccination against varicella zoster reactivation (Zostavax®) has been approved for use in the U.S. since 2006. This live attenuated vaccine increases the numbers of both $CD4^+$ and $CD8^+$ effector memory T cells[8]. The vaccine is currently recommended by the Center for Disease Control's Advisory Committee on Immunization Practices for individuals over 60 years of age without immune compromise as part of regular preventive healthcare. Vaccination with live-attenuated virus has been shown to reduce the incidence of dermatological manifestations of herpes zoster by 50% for up to three years; however, the efficacy to prevent herpes-zoster reactivation is not complete

Table 1: Patient demographics and pertinent laboratory analysis

	Patient #1	Patient #2
Age	73 Years Old	72 Years Old
Gender	Male	Male
Ethnicity	Caucasian	Caucasian
Date of Zoster Vaccination (Years prior to presentation)	2010 (6)	2012 (3)
Serum white blood cell count	4.48 X 10^9/L	9.10 X 10^9/L
Hemoglobin	13.8 g/dL	14.4 g/dL
Platelet Count	122,000	311,000
Serum Creatinine	1.2 mg/dL	1.0 mg/dL
Cerobrospoinal Fluid Glucose	60 mg/dL	44 mg/dL
Cerobrospoinal Fluid Protein	110 mg/dL	224 mg/dL
CSF White Blood Cell Count	303 cells/µL	328 cells/µL
CSF Red Blood Cell Count	66 cells/µL	0 cells/µL
CSF Gram Stain Results	No Organisms	No Organisms
CSF Culture Results	No Growth	No Growth
CSF Viral Pathogen PCR	Positive-Varicella	Positive-Varicella

(51.3%).[13] Both patients in our series developed VZV meningoencephalitis despite previously receiving Zostavax®, with the time of presentation ranging from three to six years post-vaccination, emphasizing the incomplete efficacy of the vaccine and waning effectiveness with time.

A novel vaccine, HZ/su (Shingrix™) has recently been approved by the Food and Drug Administration (FDA). HZ/su is a single-protein, recombinant subunit vaccine containing VZVglycoprotein E and the $AS01_B$ adjuvant system. The overall vaccine effectiveness at 3.2 and 3.7 years is 97.2% in patients 50 years and older and 89.8% in patients 70 and older, respectively.[19,20] The Centers for Disease Control and Prevention (CDC) now recommends Shingrix over Zostavax for the primary prevention of VZV related complications.[25]

Conclusion

In conclusion, we present two interesting cases of VZV reactivation meningoencephalitis. Both patients were previously vaccinated against zoster reactivation and presented with atypical symptomology in the absence of the classical vesicular rash often seen with VZV reactivation. Both patients clinically improved with anti-viral treatment. This presentation emphasizes the need for heightened clinical suspicion of VZV encephalitis in older adults, and emphasizes the waning effectiveness of the live-attenuated zoster vaccination over time.

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OBITUARIES

MARSHALL - **Charles D. Daniel MD**, 79, passed away Sept. 11, 2019. Survivors include his wife of 55 years, Sharon Guthrie Daniel of Marshall; daughter, Tara Lynn Griffin of Marshall; son, Scott Walker Daniel (Dana) of Little Rock; and six grandchildren. Dr. Daniel attended and graduated from UAMS in 1967 and began his internship at St. Vincent Hospital 1967-1968. From an early age, he knew he wanted to be a doctor and practice in Searcy County. "I knew this was something I was supposed to do. I knew Marshall was where I was supposed to be, he said." Dr. Daniel was described as caring, strong, compassionate, humble, genuine, passionate, loyal, family driven, gentleman, community-oriented, and with a heavy appetite for countless knowledge. He served his community in many ways including Board Certified Family Practice for 50+ years and Searcy County Health Officer for 40+ years. Dr. Daniel received the following awards: MHS Distinguished Alumni Award, Outstanding Service Award, Citizen of the Year Award from SCEDC, U.S. Representatives Congressional Recognition Report, Citation from the Arkansas House of Representatives, and the Distinguished Service Award from Arkansas Hospital Association.

LITTLE ROCK - **Garry Bernard Glasco, MD**, passed away Sept. 3, 2019. After graduation, Glasco worked as a chemist at Maybelline Cosmetics Company. He earned a Master of Arts Degree in Chemistry from the University of Arkansas at Little Rock (UALR). Dr. Glasco went on to earn his medical degree from UAMS in 1992, where he received the H. Elvin Sheffield Award for medical leadership. He also received the SNMA Edith Irby Jones Chapter Outstanding Senior Award and was elected as president of the Associated Student Government. During his internal medicine residency, he served one year as chief resident. He was a member of the Arkansas Medical Society. After completing his nephrology fellowship, Dr. Glasco entered private practice with Nephrology Associates in central Arkansas. Dr. Glasco is survived by his wife, Gwendolyn Moore Glasco; and two daughters, Gillian Jeane' Glasco and Giahna Lauryn Glasco.

2019 Table Rock Regional Roundup

Riley N. Sanders, MD, from the UAMS Department of Ophthalmology/Jones Eye Institute and representing the Arkansas Ophthalmological Society, placed first in the Resident Paper Competition at the 2019 Table Rock Regional Roundup for his presentation, Evaluating a New Hospital Protocol to Reduce General Anesthesia-Associated Corneal Injury.

Dr. Riley Sanders and Dr. Paul Phillips.

The conference is a joint venture of the Arkansas Ophthalmological Society, Kansas Society of Eye Physicians & Surgeons, Missouri Society of Eye Physicians and Surgeons and the Oklahoma Academy of Ophthalmology.

Dr. Riley Sanders and Dr. Kellye Smith.

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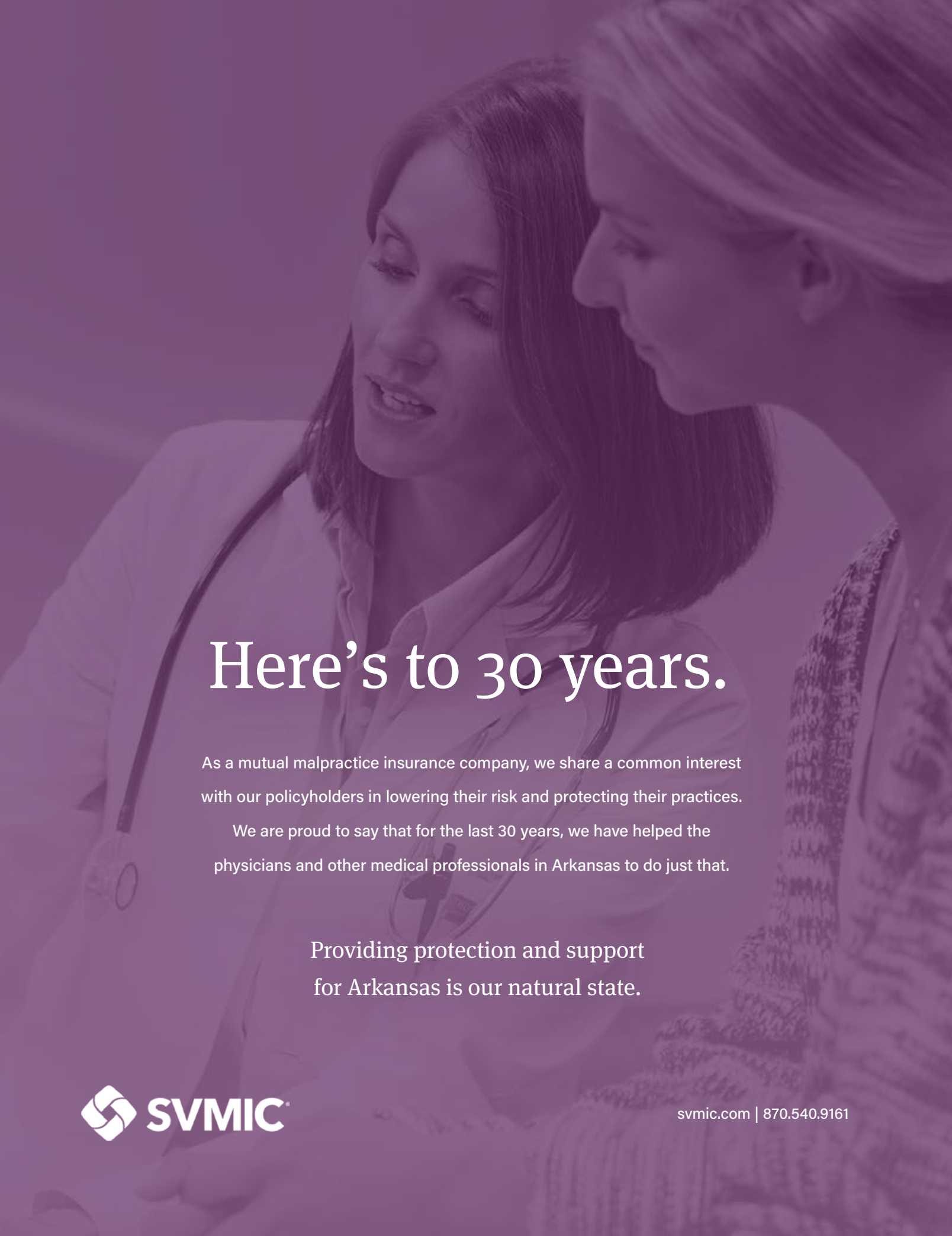

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