Chicago Dermatological Society

September 2020 Educational Conference

Program & Speaker Information
CME Certification
Case Presentations

Wednesday, September 9, 2020
ONLINE Conference

Conference Host:
Division of Dermatology
Loyola University Medical Center

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Program

Host: Loyola University
Wednesday, September 9, 2020
Online Conference

9:00 a.m.	**Welcome & Introduction** *David Mann, MD - CDS President*
9:05 a.m. - 9:30 a.m.	**Morning Lecture** "Adjuvant Radiation for High-risk Cutaneous Squamous Cell Cancer: When, Why and How" *Shlomo Koyfman, MD*
9:30 a.m. - 9:40 a.m.	**Questions & Answers**
9:40 a.m. - 10:15 a.m.	**Resident Case Presentations & Discussion; MOC Self-Assessment Questions** *Loyola University Residents*
10:15 a.m. - 10:40 a.m.	**Keynote Guest Lecture** "The Increasing Role of Immunotherapy in Cutaneous Squamous Cell Cancer" *Shlomo Koyfman, MD*
10:40 a.m. - 10:45 a.m.	**Questions & Answers**
10:45 a.m. - 10:50 a.m.	**Closing Remarks and Introduction of Discussion Breakout Rooms** *David Mann, MD*
11:00 a.m. - 12:00 p.m.	**Breakout Rooms*** • Medical Students • Covid Best Practices in the Clinic and the Office • Life Outside of Work – Finding and Keeping a Balance • Free-for-All open discussion
2:00 p.m.	**Meeting adjourns**

* Four separate Zoom meeting links will be posted on the CDS website: https://www.chicagoderm.org/monthly-meeting-2020-september

Each of the topics will have its own link. Simply pick the one you wish to join and click on the corresponding link. A moderator will be present to help facilitate the conversation.

Mark the Date!

Next CDS virtual meeting will be on Wednesday, October 14th
Watch for details on the CDS website: www.ChicagoDerm.org

Guest Speaker

SHLOMO ASHER KOYFMAN, MD

Associate Professor of Medicine; Director of Head and Neck and Skin Cancer Radiation, Joint Appointment in Departments of Radiation Oncology and Bioethics; The Cleveland Clinic, Cleveland, OH

Shlomo Koyfman, MD is an Associate Professor of Medicine at the Cleveland Clinic in the department of radiation oncology. Dr. Koyfman completed his undergraduate education in 2002 at Yeshiva University in New York City, and then earned his medical degree at Yale University School of Medicine in 2006. He finished a residency in radiation oncology at the Cleveland Clinic in 2011. Dr. Koyfman's specialty interests include head and neck cancer, skin cancer, image guided radiation therapy, intensity modulated radiation therapy, anorectal cancer, bioethics, and clinical trials.

Dr. Koyfman has a long and impressive list of accomplishments, including serving as on the editorial board of the Journal of Clinical Oncology and as a reviewer for a number of oncology-related publications. He has a number of book chapters to his credit, as well as citations for many peer-reviewed articles.

CME Information

September 9, 2020

Overview

The Chicago Dermatological Society was established in 1901 and has strived to provide meaningful educational opportunities to dermatologists in the Chicago area for more than a century. Guest speakers from across the country share their expertise with CDS members, as well as residents in training medical students doing their dermatology rotation. CDS schedules six day-long meetings each year which are "hosted" by one of the dermatology residency programs in the city. Two lectures are given by the guest speaker, and the residents of the host institution present cases which are offered for audience discussion. During the coronavirus pandemic, CDS has continued to organize our regular educational conferences, but these are providing in a somewhat shorter “virtual” setting.

Target Audience

This activity has been designed to meet the educational needs of dermatologists. CDS members, residents in training and medical students engaged in their dermatology rotation are invited to attend.

Learning Objectives

At the conclusion of the 2019/20 series of meetings, the participant should be able to:
1. Discuss when it is appropriate to consider adjuvant radiation for high-risk cutaneous squamous cell cancer.
2. Describe the increasing role of immunotherapy in cutaneous squamous cell cancer.
3. List the benefits and risks of immunotherapy when managing patients with cutaneous squamous cell cancer.

Physician Accreditation Statement

This activity is planned and implemented by Indiana Academy of Ophthalmology (IAO) and the Chicago Dermatological Society. IAO is accredited by the Indiana State Medical Association to provide continuing education for physicians.

Credit Designation for Physicians – IAO designates this live activity for a maximum of 2 *AMA PRA Category 1 Credit(s)*™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Attendees are required to submit a CME claim form upon departure from the conference. Please leave your form, along with the evaluation form, at the registration table when you leave the meeting. Thank you for your attention to this important item.

Disclosure of Conflicts of Interest

The IAO and CDS require instructors, planners, managers and other individuals and their spouse/life partner who are in a position to control the content of this activity to disclose any real or apparent conflict of interest they may have as related to the content of this activity. All identified conflicts of interest are thoroughly vetted by IAO and CDS for fair balance, scientific objectivity of studies mentioned in the materials or used as the basis for content, and appropriateness of patient care recommendations. All speakers are asked to follow the "first slide" rule to repeat their conflict of interest disclosures during their talk. None of the participants in this conference have disclosed any relevant potential conflicts of interest.

Continued next page

Contact Information

For information about the physician accreditation of this program please contact the CDS administrative office at: 847-680-1666; email: Rich@RichardPaulAssociates.com

Americans with Disabilities Act

In compliance with the Americans with Disabilities Act, we will make every reasonable effort to accommodate your request. For any special requests, contact CDS at: Rich@RichardPaulAssociates.com

Disclaimer

Participants have an implied responsibility to use the newly acquired information to enhance patient outcomes and their own professional development. The information presented in this activity is not meant to serve as a guideline for patient management. Any procedures, medications, or other courses of diagnosis or treatment discussed in this activity should not be used by clinicians without evaluation of patient conditions and possible contraindications on dangers in use, review of any applicable manufacturer's product information, and comparison with recommendations of other authorities.

Dislosure of Unlabeled Use

This educational activity may contain discussion of published and/or investigational uses of agents that are not indicated by the FDA. The planners of this activity do not recommend the use of any agent outside of the labeled indications. The opinions expressed in the educational activity are those of the faculty and do not necessarily represent the views of the planners. Please refer to the official prescribing information for each product for discussion of approved indications, contraindications, and warnings.

Chicago Dermatological Society **CASE #1**

David Rosenfeld[1] MD, David Eilers[2] MD
[1]Division of Dermatology, Loyola University Medical Center
[2]Division of Dermatology, Edward Hines, Jr. VA Hospital

HISTORY OF PRESENT ILLNESS

A 78-year-old white man presented to the Hines VA dermatology clinic for treatment of biopsy-proven superficial basal cell carcinoma (BCC) on the right forehead and squamatized BCC on the right inferior buttock. He was also concerned about multiple other skin lesions on his chest, back, arms and hands, many of which had been present for 1-2 years. He described the lesions as pink, scaly and thick. He denied any pain, bleeding, other drainage or recent changes. He has a 20+ year history of various non-melanoma skin cancers (NMSC) that have been managed at multiple outside hospitals. Treatment modalities included cryotherapy, wide local excision (WLE) and electrodessication and curettage (ED&C). He reported having asthma as a child and recalled taking an elixir from well water in Kentucky. Years later, the well water was found to be contaminated with arsenic.

PAST MEDICAL HISTORY

COPD, DM2, Hyperlipidemia, Hypertension

PAST SURGICAL HISTORY

None

MEDICATIONS

Albuterol inhaler**,** Metformin**,** Insulin**,** Atorvastatin**,** Losartan**,** Carvedilol

ALLERGIES

Penicillin, Bananas

FAMILY HISTORY

None pertinent

SOCIAL HISTORY

3-5 cigarettes per day, Denies alcohol or illicit drug use

PHYSICAL EXAMINATION

The patient was in no acute distress. Cutaneous examination revealed multiple pink-erythematous scaly papules and plaques, many on the trunk and extremities (notably in non-sun-exposed areas). There were hyperkeratotic papules on several digits and bilateral palms. There were also several hypopigmented macules and patches at sites of previous cryotherapy and ED&C procedures.

DIAGNOSIS

Arsenic toxicity complicated by multiple NMSC and arsenical keratoses

TREATMENT

Given the extent of disease and history, the patient was reluctant to have any further biopsies

performed. Regarding the two biopsy-proven BCCs, treatment options, including WLE, ED&C and imiquimod were reviewed with the patient. He preferred treatment with imiquimod. We recommended treating a clinically-suspicious SCCis on the left upper arm with imiquimod as well. Topical imiquimod 5% cream was prescribed for application once daily Monday through Friday for 6 weeks. We also discussed that arsenic toxicity is associated with an increased risk of cutaneous and internal malignancies, particularly lung and genitourinary. Per chart review and patient discussion, he was up-to-date on age-appropriate cancer screenings. Although no formal guidelines are available, his primary care physician was notified of suspected arsenic toxicity. Remaining suspicious lesions were deferred for treatment until follow-up.

DISEASE COURSE

The patient was seen at follow-up 3 months later with resolution of the treated lesions. On examination, residual erythema was observed at sites treated with imiquimod. No evidence of tumor by visual inspection or palpation was identified. Additional lesions on the chest and back were selected for continued imiquimod therapy. The patient continued to prefer treatment rather than multiple biopsies. In regards to malignancy screening, the patient is up to date with all his age-appropriate imaging and laboratory work. He does have a history of gastrointestinal bleed and anemia of chronic disease. He receives regular colonoscopies with no significant findings to date. Given his history of cigarette smoking, he has also had low-dose CT scans, which have shown no signs of malignancy. Routine urinalyses have also been unremarkable.

DISCUSSION

Arsenic is a ubiquitous metal and ranks 20th in abundance among all the elements. It is the world's most common source of heavy metal poisoning. Exposure occurs via drinking water, agricultural uses, ore mining and medicinal applications. Chronic exposure poses significant health risks. Historically, there have been multiple chemical forms of arsenic. Asiatic pills (arsenic with opium or pepper) are still available in India and the Far East. Traditional Chinese medicine may also continue to use inorganic arsenic. The Western world has generally abandoned arsenicals, although treatments of asthma with Fowler's solution (liquor potassii arseniatis) continued until the 1960s in parts of the US. Arsenic trioxide is now used therapeutically for acute promyelocytic leukemia. Interestingly, metallic arsenic was consumed in large quantities by "arsenic eaters" of the Swiss and Australian Alps, believing that consumption would improve physical strength. Inorganic arsenic (the toxic form) is believed to have caused Napoleon's death.

Accidental exposure to arsenic still occurs via contaminated drinking water in more than 30 countries. Carless contamination has resulted from mining of ores containing silver, gold, tin, copper and other metals. The current World Health Organization and Environmental Protection Agency guidelines limit arsenic concentration in drinking water to 0.01 mg/L. This was recently reduced from 0.05 mg/L as cutaneous and internal malignancies have been shown to develop with the previous level of exposure. No chronic skin changes been noted with arsenic concentrations less than 0.017 mg/L. It is currently estimated that 100 million people are exposed to arsenic levels in drinking water that exceed 0.01 mg/L. According to the United States Geological Survey (USGS), dangerous arsenic exposure occurs in more than 25 states impacting at least 2.1 million people. Southwest United States is the region of greatest concern with approximately 16% of well water with arsenic levels above the recommended level.

Chronic exposure to inorganic arsenic poses an increased risk for developing several types of cancer. Trivalent inorganic arsenic is the most toxic form with a latent period for chronic manifestations of 30-50 years. Occupational exposure to arsenic may include use of pesticides, herbicides or treated wood, working with electroplating, mining, smelting, wine making and carpentry and manufacturing gallium arsenide computer microchips.

The pathogenesis of arsenic toxicity involves both oxidative DNA damage and activation of transcription factors, which lead to chromosomal aberrations and interference with cellular signaling. This results in carcinogenicity.

Clinical features of arsenic exposure can be divided into acute and chronic, with requires a minimum of 5 years of exposure. Acute exposure (medicinal, homicidal or suicidal) produces a variety of cutaneous features, including flushing, erythema and Mees' lines of the nails. Systemic features include GI upset, peripheral neuropathy, pancytopenia, metallic breath and renal/respiratory failure. Chronic exposure is characterized by hyperpigmentation with superimposed guttate hypopigmentation ("raindrops of a dusty road") as well as arsenical keratoses. These are precancerous papules that occur most commonly on the palms and soles. Chronic arsenic exposure is also associated with an increased risk of NMSCs most commonly Bowen's disease) as well as extracutaneous malignancies, including genitourinary (most commonly bladder), lung and liver. According to the USGS, one in five water wells in New Hampshire is impacted by toxic levels of arsenic. New Hampshire also has the highest rate of bladder cancer (37% higher than the national average). A 2014 study from Dartmouth found that 830 bladder cancers were associated with arsenic toxicity.

Treatment of acute arsenicism is chelation therapy with dimercaprol being the most widely used. Chronic arsenicism is best treated by managing the associated findings. Oral retinoids have been reported to reduce arsenical keratoses and decrease formation of arsenical BCCs. NMSCs are usually managed with traditional therapies. Arsenical keratoses can be treated with topical keratolytics, topical chemotherapies and surgeries. Although there is an increased risk of extracutaneous malignancies, no specific guidelines for monitoring are available. Age-appropriate cancer screenings and review of systems by primary care physicians is generally recommended.

REFERENCES

Ahsan H, Chen Y, Parvez F, et al. Arsenic exposure from drinking water and risk of premalignant skin lesions in Bangladesh: baseline results from ighest rate of bladder cancer (37% higher than the national average).
the Health Effects of Arsenic Longitudinal Study. Am J Epidemiol 2006; 163:1138.

Baris D, Waddell R, Beane Freeman LE, et al. Elevated Bladder Cancer in Northern New England: The Role of Drinking Water and Arsenic. *J Natl Cancer Inst*. 2016;108(9):djw099. Published 2016 May 2. doi:10.1093/jnci/djw099

Bolognia, Jean, et al. "Injury due to chemical exposure." *Dermatology*. Elsevier, 2018. pp. 1580-1584

Chiou HY, Hsueh YM, Liaw KF, et al. Incidence of internal cancers and ingested inorganic arsenic: a seven-year follow-up study in Taiwan. Cancer Res 1995; 55:1296.

Chowdhury UK, Biswas BK, Chowdhury TR, et al. Groundwater arsenic contamination in Bangladesh and West Bengal, India. *Environ Health Perspect*. 2000;108(5):393-397. doi:10.1289/ehp.00108393

Cuzick J, Sasieni P, Evans S. Ingested arsenic, keratoses, and bladder cancer. *Am J Epidemiol*. 1992;136(4):417-421. doi:10.1093/oxfordjournals.aje.a116514

Mayer JE, Goldman RH. Arsenic and skin cancer in the USA: the current evidence regarding arsenic-contaminated drinking water. Int J Dermatol 2016; 55:e585.

Naujokas MF, Anderson B, Ahsan H, et al. The broad scope of health effects from chronic arsenic exposure: update on a worldwide public health problem. Environ Health Perspect 2013; 121:295.

Järup L. Hazards of heavy metal contamination. *Br Med Bull*. 2003;68:167-182. doi:10.1093/bmb/ldg032

The United States Geological Survey

Chicago Dermatological Society **Case #2**

[1]Adam Vaudreuil, [2]Jodi Speiser, and [1]Eden Lake.
[1]Division of Dermatology, Loyola University Medical Center
[2]Department of Pathology, Loyola University Medical Center

HISTORY OF PRESENT ILLNESS

A 65-year-old woman presented to Dermatology with ulcerations and discoloration of the bilateral lower legs associated with paresthesias, edema, and pruritus. Patient reported a history of Raynaud's disease starting two years prior, followed by the development of these leg ulcerations one year later. She had been previously seen by vascular surgery for lesions on the toes thought to be vascular/necrotic in nature. Vascular surgery found no clear arterial occlusive disease. She was treated with compression stockings and aspirin for possible venous insufficiency without improvement. Additional review of systems was largely negative except for fatigue and muscles aches.

PAST MEDICAL HISTORY

Degenerative joint disease of the lumbar spine s/p surgery, osteoporosis, Raynaud's phenomenon

MEDICATIONS

Aspirin, gabapentin, naproxen, calcium-vitamin D and iron supplements

ALLERGIES

No known drug allergies

FAMILY HISTORY

Sister with lupus (per patient)

SOCIAL HISTORY

Non-smoker, no alcohol use, no illicit drug use

PHYSICAL EXAMINATION

The patient was well-appearing. On the lower legs there were scattered erythematous patches with central dusky stellate eschars. Examination of the fingernails showed subtle ventral pterygium formation of all 10 nails with hemorrhage of the distal nail bed and dystrophic capillaries.

DERMATOPATHOLOGY

Punch biopsy performed of a lesion on the left thigh showed superficial and deep vascular dilatation with plugging of vascular lumina by hyaline material with associated chronic inflammation and dermal fibrosis.

ADDITIONAL STUDIES

A complete blood count demonstrated decreased hemoglobin at 9.8 (11.5 – 15.5 gm/dL). Erythrocyte sedimentation rate was elevated at 47 (0 – 20 mm). C-reactive protein was elevated at 21.7 (<8.1 mg/L). Anti-nuclear-antibodies were positive at a titer of 1:320. Cryoglobulin screen was positive with subsequent serum protein electrophoresis and immunofixation revealing a monoclonal band of IgG lambda. Free lambda light chains were elevated at 703.5 (5.7 – 26.3

mg/L). Urinalysis showed proteinuria and microscopic hematuria. Lupus anticoagulant, anti-CCP, cardiolipin, beta-2-microglobulin, RNP, SM, SSA, SSB, SCL-70, Jo-1, dsDNA, and ANCAs (MPO and PR3) were all negative. HCV, HIV, and quant gold exams were also negative.

DIAGNOSIS

Type I Cryoglobulinemia

TREATMENT AND COURSE

The patient was started on an oral prednisone taper with improvement in her symptoms and colchicine was subsequently added at follow-up. Patient is scheduled to see hematology/oncology for further evaluation of monoclonal gammopathy.

DISCUSSION

Cryoglobulinemias are a group of disorders characterized by the presence of abnormal immunoglobulins in the serum, called cryoglobulins, that precipitate at low temperatures and then dissolve again at higher temperatures (>37°C). There is a female predilection with a female to male ratio of 2:1, with onset usually in the 4^{th} or 5^{th} decade of life, and no difference in prevalence across ethnic groups.

This group of disorders is most commonly classified into three subtypes. Type I cryoglobulinemia is defined by the presence of a single monoclonal immunoglobulin (typically IgM or IgG). Type II demonstrates polyclonal IgG and monoclonal IgM. The IgM in type II has rheumatoid factor activity and binds to the Fc portion of IgG, creating IgG-IgM immune complexes. Type III involves both polyclonal IgG and IgM. Types II and III are often grouped together as the "mixed cryoglobulinemias."

Regardless of subtype, patients' initial manifestation is usually vascular purpura on the lower limbs (80-90%), sometimes extending to involve the lower abdomen. Another common symptom is distal sensory or sensorimotor polyneuropathy (30-75%), most commonly on the lower legs, often presenting as neuropathic pain or paresthesia. Renal involvement occurs in 15-40% of cases, usually later in the disease, manifesting as proteinuria and microscopic hematuria. If biopsied, the kidneys show membranoproliferative glomerulonephritis. Cold-induced symptoms, such as Raynaud's disease and distal necrosis, are more common with type I. Meanwhile arthralgias and arthritis are more common in types II/III. Central nervous system, cardiac, GI, and pulmonary involvement are rare (<5%) but may manifest as abdominal pain, GI bleed, headaches, seizures, focal neurologic deficits, coronary artery disease, heart failure, myocardial infarction, bronchiolitis obliterans organizing pneumonia, or alveolar hemorrhage.

Laboratory testing involves the identification of cryoglobulins in the serum. Additional studies, such as serum protein electrophoresis and immunofixation, may be beneficial to detect a monoclonal gammopathy. Rheumatoid factor activity is seen commonly in types II/III and rarely in type I. Type II/III present with elevated LFTs 50-70% of the time (usually related to HCV infection), meanwhile this is rare in type I. The increased presence of immunoglobulins may also alter total protein and erythrocyte sedimentation rates. Complement proteins also show abnormalities. Cryoglobulinemia often shows leukocytoclastic vasculitis on histopathology. The

inflammatory infiltrate is composed of predominately lymphocytes and monocytes, with few neutrophils.

Pathophysiology is thought to be related to vascular obstruction via cryoglobulin precipitate in type I and immune-complex mediated vasculitis in type II/III.

The etiology or associations of cryoglobulinemias can be broadly put into three categories: infectious, autoimmune, or malignant. The most common causes include: chronic hepatitis C infection, Waldenstrom macroglobulinemia, multiple myeloma, monoclonal gammopathy of undetermined significance (MGUS), B-cell non-Hodgkin's lymphoma, Sjogren's syndrome, and systemic lupus erythematosus (SLE). Type I is most closely associated with Waldenstrom macroglobulinemia, myeloma, MGUS and B-cell lymphomas. While 70-90% of type II/III is secondary to chronic hepatitis C infection, other diagnoses to consider are connective tissue disease and B-cell non-Hodgkin lymphoma. Prognosis is largely based on the underlying cause but CNS, GI, and cardiac involvement portend a worse prognosis.

Treatment usually consists of treating the underlying etiology. Additional immunosuppressants (oral corticosteroids or rituximab), anti-inflammatory medications, or plasmapheresis may be used as adjunctive therapy in moderate to severe cases.

REFERENCES

Cacoub P, Comarmond C, Domont F, Savey L, Saadoun D. Cryoglobulinemia Vasculitis. The American Journal of Medicine. 2015; 128(9):950-955

Desbois AC, Cacoub P, Saadoun D. Cryoglobulinemia: An update in 2019. Joint Bone Spine. 2019; 86:707-713

Galli M, Monti G, Marson P, et al. Recommendations for managing the manifestations of severe and life-threatening mixed cryoglobulinemia syndrome. Autoimmun Rev. 2019;18(8):778-785. doi:10.1016/j.autrev.2019.06.008

Muchtar E, Magen H, Gertz MA. How I treat cryoglobulinemia. Blood. 2017;129(3):289-298. doi:10.1182/blood-2016-09-719773

Ramos-Casals M, Stone JH, Cid MC, Bosch X. The cryoglobulinaemias. Lancet. 2012;379(9813):348-360. doi:10.1016/S0140-6736(11)60242-0

Roccatello D, Saadoun D, Ramos-Casals M, et al. Cryoglobulinaemia. Nat Rev Dis Primers. 2018;4(1):11. Published 2018 Aug 2. doi:10.1038/s41572-018-0009-4

Spatola L, Generali E, Angelini C, Badalamenti S, Selmi C. HCV-negative mixed cryoglobulinemia and kidney involvement: in-depth review on physiopathological and histological bases. Clin Exp Med. 2018;18(4):465-471. doi:10.1007/s10238-018-0514-5

Takada S, Shimizu T, Hadano Y, et al. Cryoglobulinemia (review). Mol Med Rep. 2012;6(1):3-8. doi:10.3892/mmr.2012.861

Terrier B, Cacoub PCryoglobulinemia vasculitis. Current Opinion in Rheumatology. 2013;25(1):10–18. doi: 10.1097/BOR.0b013e32835b15f7.

Zuo KJ, Ménard HA, Amre R, Colmegna I. Mixed cryoglobulinemia-associated vasculitis. Arthritis Rheumatol. 2014;66(2):443. doi:10.1002/art.38285

Chicago Dermatological Society **Case #3**

Presented by [1]Joy Tao MD, [1]Maureen Riegert MD, [1]Mariam Mafee MD, [2]Kumaran Mudaliar MD, [1]Wendy Kim DO
[1]Division of Dermatology, Loyola University Medical Center
[2]Department of Pathology, Loyola University Medical Center

HISTORY OF PRESENT ILLNESS

A 1-day-old male infant presented as a transfer to the NICU with a diffuse congenital rash. Upon birth, the baby was noted to have a diffuse rash over the trunk that was described as purple-red macules with some induration. In the hours after birth, the rash progressed and spread over the face, neck, upper and lower extremities, and trunk, sparing the palms and soles. He was hemodynamically stable and feeding well. The baby's mother was a 31-year-old G1P0 woman with the following maternal serologies: A+/Ab-/HIV-/HepB-/RPR NR/GC-/chlamydia -/Rubella immune/GBS-. The pregnancy was uncomplicated, other than an upper-respiratory infection 1-2 months prior to delivery. The baby's mother took amoxicillin and flagyl during her pregnancy for fluid in her ear and bacterial vaginosis respectively. Due to concern for congenital rash, the baby was transferred to Loyola NICU for further management and dermatology consult.

PAST MEDICAL HISTORY

Born at 39 weeks via C-section for breech presentation; birth weight 8 lbs 3 oz

MEDICATIONS

No medications

ALLERGIES

No known allergies

FAMILY HISTORY

Crohn's disease-mother (controlled - not taking medications)

SOCIAL HISTORY

Lives with mother and father and 2 half-siblings

PHYSICAL EXAMINATION

The patient was a well-appearing, Fitzpatrick type IV male infant. The face, neck, chest, abdomen, and bilateral upper and lower extremities had many erythematous macules and patches, some with central induration and tiny vesicles. There was a peau d'orange appearance of many of the lesions. The left medial knee had several linear vesicles. The palms and soles were spared. The ocular and oral mucosa were clear on exam.

DERMATOPATHOLOGY

Histological sections from punch biopsies of the left medial knee and right abdomen showed numerous mast cells with admixed eosinophils present throughout the dermis. There were relatively more mast cells on the left medial knee sample. The mast cells did not show significant cytological atypia. Immunohistochemical stains show that the mast cells were positive for mast cell tryptase, CD117, and CD68, and that they were negative for CD34, CD2, and CD25.

ADDITIONAL STUDIES

Tryptase was elevated at 44.3. (<11mcg/L). Serum IgE was normal (<2).
A complete blood count, complete metabolic profile, C-reactive protein and blood cultures were unremarkable. Abdominal ultrasound was unremarkable with no evidence of hepatosplenomegaly. KIT 816 genetic testing was negative.

DIAGNOSIS

Congenital diffuse cutaneous mastocytosis

TREATMENT AND COURSE

Treatment with cetirizine 1mg daily was initiated, and famotidine 1.6mg daily as needed for diarrhea or flushing was added. He was also prescribed hydrocortisone 2.5% ointment to the body and tacrolimus 0.03% ointment to the face twice daily as needed for blisters or raised lesions. Topical cromolyn paste was applied to skin after his bath every few days. His parents were also instructed to avoid triggers for mast cell activation including extreme temperatures, NSAIDs, salicylates, polymyxin B, anticholinergics, opioids, radiocontrast, vancomycin, and friction or trauma of the skin. He was instructed to take cetirizine and famotidine prior to receiving vaccinations.

At three months of age, his skin remains stable. He continues to develop papules and plaques along with numerous vesicles. His flares are triggered by heat and friction. He has not developed signs of systemic involvement, and he continues to gain weight and follow his growth curve.

DISCUSSION

Mastocytosis encompasses a group of disorders related to clonal proliferation and mast cell infiltration of organs. Cutaneous mastocytosis (CM) is limited to the skin whereas systemic mastocytosis involves extracutaneous organs including bone marrow, lymph nodes, spleen, and liver. Children with mastocytosis generally only manifest cutaneous symptoms. Just over half of patients develop symptoms by age two, and up to a quarter of pediatric cases are congenital.

Mast cells play a significant role in allergic and hypersensitivity disorders through both IgE and non-IgE mechanisms. Mast cell degranulation leads to the release of many different mediators including histamine, tryptase, prostaglandins, leukotrienes, and cytokines, which can cause both cutaneous symptoms including flushing, urticaria, and pruritus as well as systemic symptoms such as abdominal pain, diarrhea, nausea, palpitations, dyspnea, and syncope. Spontaneous c-kit mutations are the most frequently seen genetic abnormality in patients with mastocytosis.

There are three different subtypes of cutaneous mastocytosis seen in children: urticaria pigmentosa (UP), solitary mastocytoma, and diffuse CM (DCM), with UP being the most common subtype. A mastocytoma is a single or up to three yellow to brown plaques or nodule on the trunk or extremities. The lesions of UP consist of yellow or reddish-brown macules and papules with a central body distribution, sparing the palms and soles. DCM consists of diffuse skin involvement with many yellow to brown papule and plaques that coalesce into large areas with a generalized leathery or “peau-d’orange” appearance. For all three subtypes, non-scarring

vesicle or bullae formation can occur. Children with diffuse skin involvement are also at higher risk of developing 'mastocytosis syndrome' in which large amounts of histamine release leading to both local and systemic absorption results in symptoms including headache, pruritus, diarrhea, and hypotension.

The diagnosis of CM in children is generally clinical. A positive Darier's sign and an elevated serum tryptase can support the diagnosis. The diagnosis can be confirmed with a punch biopsy. Complete blood count and blood chemistries are frequently obtained upon presentation only in those with more extensive disease to rule out systemic involvement. Overall, comprehensive imaging and laboratory testing are generally unnecessary in pediatric patients. More invasive studies such as bone marrow biopsy are only indicated in those with signs of systemic disease.

Histologically, cutaneous mastocytosis shows increased mast cell infiltrates within the dermis, which can be highlighted using stains such as Giemsa, toluidine blue, or tryptase or KIT (CD117) specific monoclonal antibodies. Mast cell densities can be estimated using a morphometric technique, with macular, papular, and nodular lesions having average concentrations 9 times, 12 times, and 158 times higher than normal skin respectively. Additionally, there are sometimes eosinophils in the dermis as well as hyperpigmentation of the epidermis at the basal layer.

For the majority of children with CM, the prognosis is favorable. Many children have little to no symptoms and require minimal or no treatment. For the children who do develop symptoms, including those with DCM, the disease usually improves in several months to years, with most cases either spontaneously resolving by puberty or experiencing a significant reduction in the number of lesions. Treatment is generally symptomatic with a goal of improving quality of life. The avoidance of triggers that can induce degranulation is vital. Symptoms can be provoked by physical stimuli such as extreme temperatures, pressure, trauma, exercise, insect stings, or spicy foods. Many drugs can also exacerbate symptoms including opioids, salicylates, NSAIDs, anticholinergics, vancomycin, polymyxin B, systemic anesthetics, contrast agents, and muscle relaxants. Antihistamines are usually effective at reducing flushing and itching. H2 blockers can be helpful for controlling gastrointestinal symptoms such as diarrhea, bloating, and abdominal pain. Topical steroids are also used to help alleviate cutaneous manifestations. Cromolyn sodium, a mast cell membrane stabilizer, can improve GI symptoms. Topical preparations may also be effective at decreasing pruritus. Children with diffuse skin involvement who are at risk for hypotension or 'mastocytosis syndrome' should carry an epinephrine pen kit. For more severe cases, systemic drugs including imatinib, omalizumab, and cladribine have been used.

We present this case to highlight a rare congenital rash for clinical interest.

REFERENCES

Abid A, Malone MA, Curci K. Mastocytosis. *Primary Care* 2016; 43(4): 505-518.

Briley LD, Phillips CM. Cutaneous Mastocytosis: A Review Focusing on the Pediatric Population. *Clinical Pediatrics* 2008; 47(8): 757-761.

Castells M, Metcalfe DD, Escribano L. Guidelines for the Diagnosis and Treatment of Cutaneous Mastocytosis in Children. *American Journal of Clinical Dermatology* 2011; 12(4): 259-270.

Carter MC, Metcalfe DD, Komarow HD. Mastocytosis. *Immunology and Allergy Clinics of North America* 2014; 34(1): 181-96.

Cutaneous Tumors and Tumor Syndromes. In: Paller AS, Mancini AJ. *Hurwitz Clinical Pediatric Dermatology*, 4th Ed. Elsevier, 2011. p 206-208.

Le M, Miedzybrodzki B, Olynych T, Chapdelaine H, Ben-Shoshan M. Natural history and treatment of cutaneous and systemic mastocytosis. *Postgraduate Medicine* 2017; 129(8): 896-901.

Matito A, Azaña JM, Torrelo A, Alvarez-Twose I. Cutaneous Mastocytosis in Adults and Children: New Classification and Prognostic Factors. *Immunology and Allergy Clinics of North America* 2018; 38(3): 351-363.

Tharp, M. Mastocytosis. In: Bolognia J, Schaffer J, Cerroni L. *Dermatology*, 3rd Ed. Elsevier, 2012. p 1993-2002.

Theoharides TC, Valent P, Akin C. Mast Cells, Mastocytosis, and Related Disorders. *New England Journal Medicine* 2015; 373(2): 163-172.

Wilcock A, Bahri R, Bulfone-Paus S, Arkwright PD. Mast cell disorders: From infancy to maturity. *Allergy* 2019; 74(1): 53-63.

Chicago Dermatological Society **Case #4**

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HISTORY OF PRESENT ILLNESS

Patient is a 45-year-old Hispanic male who presented with nodules on the trunk and extremities for 6 months. Patient reported that lesions typically resolve after 2-3 weeks and recur in different locations. The most recent lesions appeared a week prior to hospital admission. He endorsed a 1-year history of easy bruising, night sweats, chills, fatigue, and a 15-20 pound weight loss. Patient denied trauma to affected areas, pruritus and bleeding.

PAST MEDICAL HISTORY

None

MEDICATIONS

None

ALLERGIES

No known drug allergies

FAMILY HISTORY

No pertinent family history

SOCIAL HISTORY

Drinks alcohol occasionally. Denies smoking or illicit drug use. Works in construction.

PHYSICAL EXAMINATION

The patient was well-appearing. On the left lower back and right lateral thigh, there were tender ecchymotic firm nodules. On the left abdomen and right lateral knee there were violaceous papules.

DERMATOPATHOLOGY

Punch biopsy of a nodule on the right lateral thigh showed a subcutaneous predominantly lobular infiltrate of numerous neutrophils and other granulocyte precursors (promyelocytes, myelocytes, metamyelocytes, and bands). No blasts were identified and there were no significant epidermal or dermal changes. Immunohistochemical stains showed the granulocytes and precursors with diffuse expression of myeloperoxidase and leukocyte common antigen (LCA). CD34, CD117, e-cadherin and CD61 were negative in these cells. Fluorescent in-situ hybridization was positive for a variant BCR/ABL1 fusion.

ADDITIONAL STUDIES

Laboratory studies revealed white blood cell count of 604.5 x 10^3/ μL with 1% blasts, 4% promyelocytes, 27% myelocytes, 20% metamyelocytes, 20% bands and 25% neutrophils, hemoglobin 8.2 g/dL, and platelet count of 154 x 10^3/ μL.

A bone marrow biopsy was performed showing a hypercellular marrow with marked myeloid expansion and 4% blasts consistent with involvement by chronic myeloid leukemia. BCR/ABL1 gene rearrangement and BCR/ABL1 P210 fusion transcript were detected by cytogenetic studies and quantitative polymerase chain reaction respectively.

DIAGNOSIS

Panniculitis-like chronic myeloid leukemia cutis

TREATMENT AND COURSE

Patient was started on dasatinib with resolution of the lesions and no recurrences.

DISCUSSION

Leukemia cutis is the cutaneous infiltration of neoplastic leukocytes and their precursors into the epidermis, the dermis, or the subcutis. Majority of cases, about 50-70%, are associated with the blast transformation phase of acute monocytic, myelomonocytic and T-cell leukemias either as the initial presentation or during the course of illness. Only about 2-8% of cases occur as a manifestation of chronic myeloid leukemia (CML). When it occurs in patients with chronic hematological malignancies, skin involvement usually represents transformation into a blastic phase with >20% blasts, suggesting disease progression.

Cutaneous manifestations of leukemia cutis range from solitary, grouped or disseminated erythematous papules, nodules, infiltrated plaques or bullae. Lesions occur on the head, trunk and extremities and less commonly on acral surfaces and mucosa. Unusual presentations include eczematous, lichenoid and panniculitis-like lesions. Panniculitis in leukemia patients can present as a reactive inflammatory response to medications or systemic illness. For example, cases of panniculitis have been described in CML patients treated with tyrosine kinase inhibitors (TKIs) such as dasatinib or ponatinib. Panniculitis-like presentation of leukemia cutis is very rare and to our knowledge has not been reported as a presentation chronic myeloid leukemia cutis.

Histologically, leukemia cutis typically spares the upper papillary dermis (called a Grenz zone) with mild, moderate or dense leukemic infiltrates and demonstrates diffuse or nodular dermal patterns, and perivascular and periadnexal infiltration. Involvement of the subcutis is not an uncommon finding in deep biopsies. Our case is unusual because there is complete sparing of the dermis with sole involvement of the subcutis as is typically seen in panniculitides. The cytomorphology of leukemia cutis during blast crisis usually shows medium to large-sized mononuclear cells with scant cytoplasm, large nuclei with finely dispersed chromatin, indented or irregular nuclear contours, and distinct basophilic single nucleoli. Leukemia cutis in CML may present with a more polymorphous infiltrate of a variable mixture of mature and immature cells of the granulocytic series (myelocytes, metamyelocytes, eosinophilic metamyelocytes, and segmented neutrophils) with predominance of blastic elements. Our case strays from this pattern as the leukemic infiltrates span a range of maturing granulocytes with rare to absent blasts. The presence of these maturing granulocytes excludes the possibility of subcutaneous Sweet syndrome which would contain only mature neutrophils.

Leukemia cutis typically signals an aggressive clinical course with an average survival time of 9 months. Management is achieved via treatment of underlying disease. Early treatment with

induction and consolidation chemotherapy with TKIs followed by allogeneic bone marrow transplant can prolong survival.

We present this case to highlight an atypical presentation of leukemia cutis in a CML patient.

REFERENCES

Mallya, Varuna, Kavita Sahai, Sandeep Arora, and Bhushan Asthana. "Leukemia cutis." *Clinical Cancer Investigation Journal* 4, no. 3 (2015): 384.

Kanade, U., S. Birare, P. Gadgil, and S. Swami. "A case of chronic myelogenous leukemia cutis: A rare presentation." *Indian journal of dermatology* 56, no. 4 (2011): 451.

Wagner, Gunnar, Klaus Fenchel, Walter Back, Alina Schulz, and Michael Max Sachse. "Leukemia cutis–epidemiology, clinical presentation, and differential diagnoses." *JDDG: Journal der Deutschen Dermatologischen Gesellschaft* 10, no. 1 (2012): 27-36.

Cho-Vega, Jeong Hee, L. Jeffrey Medeiros, Victor G. Prieto, and Francisco Vega. "Leukemia cutis." American Journal of Clinical Pathology 129, no. 1 (2008): 130-142.

Vinay, Keshavamurthy, Debajyoti Chatterjee, Uday Yanamandra, Uma Nahar Saikia, Pankaj Malhotra, and Sunil Dogra. "Leukemia cutis mimicking erythema nodosum or vice versa: A histological conundrum." Indian Journal of Dermatology, Venereology, and Leprology 84, no. 1 (2018): 91.

Parsi M, Go MS, Ahmed A. Cancer, Leukemia Cutis. [Updated 2019 Nov 22]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan-.

Fraticelli, Paolo, Devis Benfaremo, Marco Cardinali, and Armando Gabrielli. "Atypical neutrophilic panniculitis as presentation of BCR-ABL1-negative chronic myeloid leukaemia." BMJ Case Reports CP 12, no. 10 (2019): e232005.

Li, L., Wang, Y., Lian, C. G., Hu, N., Jin, H., & Liu, Y. (2018). Clinical and pathological features of myeloid leukemia cutis. Anais brasileiros de dermatologia, 93(2), 216–221. https://doi.org/10.1590/abd1806-4841.20186327

Chicago Dermatological Society **Case #5**

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HISTORY OF PRESENT ILLNESS

A 59-year-old female presented with discoloration on the bilateral buttocks that had been stable for one year. She endorsed initial tender bruising to the area. The tenderness improved with time, but the discoloration never resolved. She denied any prior treatment to the area.

PAST MEDICAL HISTORY

Anemia, hypertension, hypothyroid, migraines, rheumatoid arthritis, pulmonary tuberculosis s/p treatment

MEDICATIONS

Hydroxychloroquine sulfate 200mg BID, prednisone 5mg daily, tofacitinib citrate 11mg ER daily

ALLERGIES

Aspirin

FAMILY HISTORY

No pertinent family history

SOCIAL HISTORY

Never smoker, no alcohol, history of prescription drug abuse

PHYSICAL EXAMINATION

The patient was a well-appearing Hispanic female. The bilateral buttocks had well-circumscribed blue-gray to brown hyperpigmented patches. Similar pigmentation was noted in the surgical scars on her knees.

DERMATOPATHOLOGY

Histologic sections from the punch biopsy showed iron-laden pigmented macrophages present throughout the dermis. Fontana-Masson stain was negative in the pigmented macrophages.

ADDITIONAL STUDIES

No relevant studies

DIAGNOSIS

Hydroxychloroquine-induced hyperpigmentation

TREATMENT AND COURSE

Hydroxychloroquine treatment was discontinued by the patient's rheumatologist. She was referred for treatment with Q-switched Nd:YAG laser, but the pigmentation ultimately did not bother her enough to seek further treatment. She endorses persistent pigmentation in the same areas.

DISCUSSION

Antimalarials have been known to induce hyperpigmentation since WWII, when the side effect was first reported in soldiers taking quinacrine. Hydroxychloroquine (HCQ)-induced hyperpigmentation has been described in patients from 3 months to 22 years after initiation of therapy. Our patient was taking HCQ for approximately 2.5 years before development of discoloration and 3.5 years before presentation to Dermatology. Amongst the antimalarials, HCQ has an estimated incidence of hyperpigmentation far lower than other drugs, namely chloroquine (7.3% vs 25%, respectively).

Yellow-brown to slate-gray patches may appear on both sun-exposed and sun-protected sites, most commonly the shins. Discoloration has been reported at sites of prior trauma, on oral mucosal surfaces, and nails. Histologic sections typically demonstrate superficial dermal deposition of iron, melanin, or both. Patients often report ecchymotic lesions preceding discoloration. One case-control study reported that 96% of patients with HCQ-induced hyperpigmentation were also on an anti-coagulant or anti-platelet agent, predisposing them to easier bruising. The theorized mechanism for development of hyperpigmentation includes hemosiderin deposition inducing melanocyte activation, but it has yet to be fully elucidated. Rare reports describe HCQ-induced hyperpigmentation mimicking elder abuse, making the correct diagnosis paramount.

Treatment involves cessation of HCQ therapy with at least partial resolution expected in 3-6 months. For persistent hyperpigmentation, Q-switched ruby, alexandrite, and Nd:YAG lasers have all been reported to offer significant cosmetic improvement. Given the current investigational use of HCQ as a prophylactic treatment for COVID-19, it is important to consider that the drug can have numerous side effects, including serious cutaneous conditions. A recent JAAD systematic review reported adverse cutaneous side effects ranging in severity from benign but cosmetically concerning (hyperpigmentation) to potentially life-threatening (SJS/TEN).

REFERENCES

Bahloul, E, Jallouli, M, Garbaa, S, Marzouk, S, Masmoudi, A, Turki, H, & Bahlouol, Z. Hydroxychloroquine-induced hyperpigmentation in systemic diseases: prevalence, clinical features and risk factors: a cross-sectional study of 41 cases. *Lupus* 2017;26(12):1304-1308.

Cohen, PR. Hydroxychloroquine-associated hyperpigmentation mimicking elder abuse. *Dermatology and Therapy* 2013;3(2):203-210.

Eljaaly, K, Alshehri, S, Alireza, KH, Al-Tawfiq, JA. Hydroxychloroquine safety: a meta-analysis of randomized controlled trials. *Travel Medicine and Infectious Disease* 2020;36.

Jalouoli, M, et al. Hydroxychloroqine-induced pigmentation in patients with systemic lupus erythematosus. *JAMA Dermatology* 2013;149(8):935.

Melikoglu, MA, Melikoglu, M, Gurbuz, U, Budak, BS, & Kacar, C. Hydroxychloroquing-induced hyperpigmentation: a case report. *Journal of Clinical Pharmacy and Therapeutics* 2008;33(6):699-701.

Millard, TP, Kirk, A, & Ratnavel, R. Cutaneous hyperpigmentation during therapy with hydroxychloroquine. *Clinical and Experimental Dermatology* 2004;29(1):92-93.

Nikolaou, V, Stratigos, AJ, Katsambas, AD. Established treatments of skin hypermelanoses. *Journal of Cosmetic Dermatology* 2006;5:303-308.

Puri, PK, Lountzis, NI, Tyler, W, & Ferringer, T. Hydroxychloroquine-induced hyperpigmentation: the staining pattern. *Journal of Cutaneous Pathology* 2008;35(12):1134-1137.

Sawalha, AH. Hydroxychloroquine-induced hyperpigmentation of the skin. *The Journal of* Rheumatology 2015;42(1):135-136.

Sharma, AN, Mesinkovska, NA, & Paravar, T. Characterizing the adverse dermatologic effects of hydroxychloroquine: a systematic review. *Journal of the American Academy of Dermatology* 2020;83(2):563-578.

True, DG, Bryant, LR, Harris, MD, & Bernert, RA. Clinical images: Hydroxychloroquine-associated mucocutaneous hyperpigmentation. *Arthritis & Rheumatism* 2002;46(6):1698.

Chicago Dermatological Society **Case #6**

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HISTORY OF PRESENT ILLNESS

A 78-year old female presented to the clinic with a 5-day history of a multifocal, mildly pruritic rash associated with fatigue, nausea, chills, decreased appetite, and weakness. Patient was initially diagnosed with erythema multiforme by an outside physician and was started on acyclovir 400mg QID and betamethasone ointment daily for a 5-day course without improvement. Of note, the patient had recently traveled to rural Minnesota and noted a tick bite 2 months prior to presentation, but reported the tick was not engorged at time of removal. The remainder of review of systems was negative.

PAST MEDICAL HISTORY

Arthritis, Hypertension, Hashimoto's disease

MEDICATIONS

Cholecalciferol, Cyanocobalamin, Pantoprazole
Acyclovir 400mg QID, betamethasone ointment – both prescribed for the acute episode

ALLERGIES

No known drug allergies

FAMILY HISTORY

No pertinent family history

SOCIAL HISTORY

Former smoker (35 pack years), denies drug or alcohol use

PHYSICAL EXAMINATION

The patient was well-appearing. On physical exam, there were multifocal round and oval pink non-scaling plaques with dusky centers involving the face, back, abdomen, and bilateral upper and lower extremities.

DERMATOPATHOLOGY

A 4mm punch biopsy of a lesion on the left upper back was performed by an outside physician. Pathology showed an interface dermatitis with superficial and mid-dermal perivascular and interstitial lymphoplasmacytic infiltrate.

ADDITIONAL STUDIES

A Lyme screening immunoassay as well as confirmatory IgM Lyme western blot testing were both positive.

DIAGNOSIS

Multifocal Erythema Chronicum Migrans

TREATMENT AND COURSE

Patient was started on empiric doxycycline 100mg BID for 14 days with moderate improvement in rash. Due to continued fatigue and persistent rash, doxycycline 100mg BID course was extended for an additional 7 days for a total 21 day course of doxycycline with subsequent improvement in symptoms.

DISCUSSION

Erythema Chronicum Migrans (ECM) is a cutaneous manifestation of Lyme disease, a tick-borne illness caused by the spirochete, *Borrelia burgdorferi,* and transmitted to humans by *Ixodes scapularis* ticks during the summer months in endemic regions of the United States. Transmission to human hosts occurs most effectively 48-72 hours after tick attachment; engorgement of the tick is not necessary for inoculation and transmission may even occur during tick removal due to direct pressure of the tick midgut during removal. After inoculation, *B. burgdorferi* proliferate in the connective tissue of target organs including the skin, heart, joints, and nervous system.

ECM typically presents as an annular, non-scaling erythematous patch or plaque with central clearing that can expand centrifugally by up to 3 cm/day. ECM occurs in approximately 70-80% of patients with Lyme disease. Similar to other spirochetal diseases, there are three clinical stages of Lyme disease: early localized disease, early disseminated disease; and late disseminated disease. Early localized disease is restricted to the skin and can present with a single ECM lesion 3-30 days after the tick bite. Early disseminated disease can occur weeks to months after the initial tick bite and can present with multiple ECM lesions as well as systemic symptoms such as fever, fatigue, and myalgias. Multiple ECM lesions are caused by hematogenous dissemination of the infection to the skin and is seen in 10-20% of patients with Lyme borreliosis. Late disseminated disease can present with persistent neuropathies with or without dementia, heart failure, and refractory arthritis. Acrodermatitis chronica atrophicans is a dermatologic manifestation of late disseminated Lyme disease that begins with enlarging, edematous, poorly demarcated cutaneous plaques with bluish-red discoloration on the distal extremities.

Histologic findings are often non-specific, showing superficial and dermal perivascular infiltrates composed of lymphocytes, plasma cells, and histiocytes and increased mucin deposition in dermal collagen bundles. A thickened basket-weave stratum corneum, loss of pilosebaceous units, spongiosis, and interface changes are also described in ECM. Warthrin-starry and Steiner methods can be used to detect spirochetes on biopsies from the leading edge of ECM.

The CDC currently recommends a two-tiered approach to diagnosis of Lyme disease: first a screening assay for IgG and IgM antibodies with either enzyme-linked immunosorbent assay (ELISA) or indirect fluorescent antibody (IFA) test. Positive or equivocal results on the screening assay should be followed up with a secondary confirmatory test with IgM western blot. Sensitivity of two-tiered testing is low (30-40%) during early stage Lyme disease, but increases to 70-100% with disseminated disease. Specificity of two-tiered testing is over 95% during all stages of Lyme disease.

Patients suspected to have Lyme disease should immediately begin oral doxycycline 100mg BID for at least 10 days, 14-28 days if concerned for dissemination. Other first-line agents for treatment of early localized or early disseminated disease include oral amoxicillin, oral

cefuroxime, and IV penicillin V. Patients with neurologic involvement may require more robust treatment with IV penicillin G or IV ceftriaxone.

We present this case of disseminated multifocal erythema chronicum migrans to highlight an atypical but not uncommon presentation of Lyme disease.

REFERENCES

Bhate C, Schwartz RA. Lyme disease: Part I. Advances and perspectives. *J Am Acad Dermatol*. 2011;64(4):619-638. doi:10.1016/j.jaad.2010.03.046

Bhate C, Schwartz RA. Lyme disease: Part II. Management and prevention. *J Am Acad Dermatol*. 2011;64(4):639-653. doi:10.1016/j.jaad.2010.03.047

Indiana State Department of Health: Ixodes scapularis. Retrieved August 2, 2020, from https://www.in.gov/isdh/28005.htm

Lantos P et al. Draft clinical practice guidelines by the Infectious Diseases Society of America (IDSA), American Academy of Neurology (AAN), and American College of Rheumatology (ACR): 2019 guidelines for the prevention, diagnosis and treatment of Lyme disease. 2019 Jun 26; [e-pub]

Lyme disease - Borrelia burgdorferi organism: MedlinePlus Medical Encyclopedia Image. (n.d.). Retrieved August 22, 2020, from https://medlineplus.gov/ency/imagepages/1427.htm

Mead P, Petersen J, Hinckley A. Updated CDC recommendations for serologic diagnosis of lyme disease. MMWR Morb Mortal Wkly Rep. 2019;68:703.

Miraflor AP, Seidel GD, Perry AE, Castanedo-Tardan MP, Guill MA, Yan S. The many masks of cutaneous Lyme disease. *J Cutan Pathol*. 2016;43(1):32-40. doi:10.1111/cup.12620

Moore A, Nelson C, Molins C, Mead P, Schriefer M. Current guidelines, common clinical pitfalls, and future directions for laboratory diagnosis of Lyme disease, United States. Emerg Infect Dis. 2016 Jul [*08/02/2020*]. http://dx.doi.org/10.3201/eid2207.151694

Nawas ZY, Tong Y, Kollipara R, et al. Emerging infectious diseases with cutaneous manifestations: Viral and bacterial infections. *J Am Acad Dermatol*. 2016;75(1):1-16. doi:10.1016/j.jaad.2016.04.033

Nguyen AL, de Kort WJA, Theunissen CCW
Asymmetric red-bluish foot due to acrodermatitis chronica atrophicans
Case Reports 2016;**2016:**bcr2016216033.

Sanchez E, Vannier E, Worsmer GP, Hu LT. Diagnosis, treatment, and prevention of lyme disease, human granulocytic anaplasmosis, and babesiosis: a review. JAMA. 2016;315:1767-1777.

Shapiro ED. Borrelia burgdorferi (Lyme disease). Pediatr Rev. 2014;35(12):500-509.

Steere AC. Lyme disease. N Engl J Med. 2001; 345(2): 115-125.

Steere AC, McHugh G, Damle N, Sikand VK. Prospective stud of serologic tests for Lyme disease. Clin Infect Dis 2008;47:188-95.

Torbahn G, Hofmann H, Rücker G, et al. Efficacy and Safety of Antibiotic Therapy in Early Cutaneous Lyme Borreliosis: A Network Meta-analysis. JAMA Dermatol. 2018;154(11):1292-1303.

Walls A, Burgin S. Lyme disease in adult. In: Goldsmith LA, ed. VisualDx. Rochester, NY: VisualDx; 2016. URL: https://www.visualdx.com/visualdx/diagnosis/lyme+disease?moduleId=101&diagnosisId=51890 Accessed August 1, 2020.

Weger W, Mullegger RR. Histopathology and immunohistochemsitry of dermatoborreliosis. Acta Derm Venerol (Ljubljana) 2001;10:135-142.

Zambrano MC, Beklemisheva AA, Bryksin AV, Newman SA, Cabello FC. Borrelia burgdorferi binds to, invades, and colonizes native type I collagen lattices. *Infect Immun*. 2004;72(6):3138-3146. doi:10.1128/IAI.72.6.3138-3146.2004

Chicago Dermatological Society **Case #7**

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HISTORY OF PRESENT ILLNESS

An 80-year-old male presented with a rash on the legs for the past 20 years, which spread to the dorsal arms, hands, and back in the past year. He described his skin as "leathery" and "waxy" feeling with persistent bumps and redness. He denied any pruritus or pain. He was diagnosed 18 years ago with an IgG lambda monoclonal gammopathy which had been in remission until the past year when the rash began to spread. He was advised to proceed with a bone marrow transplant when he was first diagnosed, but he declined. Since then, he has been on multiple forms of medical therapy for the gammopathy, including dexamethasone, prednisone, and lenalidomide. In addition to his rash, the patient has had weakness and sensory changes on the bilateral lower extremities for the past 2 years. Review of systems was otherwise negative.

PAST MEDICAL HISTORY

Anemia, benign essential hypertension, clostridium difficile colitis, irritable bowel syndrome with diarrhea, lichen myxedematosus, lumbar polyradiculopathy and stenosis, mixed hyperlipidemia, plasma cell dyscrasia with monoclonal gammopathy, polyneuropathy, post-cholecystectomy syndrome, pseudogout, steroid-induced osteoporosis without pathological fracture, venous thromboembolism.
No history of skin cancer, thyroid disorder, diabetes, or heavy metal exposure.

MEDICATIONS

Cinnamon, diltiazem, fish oil, lactobacillus probiotic, lenalidomide, potassium chloride, rosuvastatin, Vitamin B12, Vitamin D

ALLERGIES

No known drug allergies

FAMILY HISTORY

Colon cancer in father, alcoholic cirrhosis in mother

SOCIAL HISTORY

Denies use of alcohol, tobacco, and illicit drugs. Married with one child. Teaches high school part-time.

PHYSICAL EXAMINATION

The patient was well-appearing. The back and bilateral arms had poorly-defined pink patches. On the bilateral arms, there were subtle 1-2-millimeter indurated papules, most prominent on the dorsal hands. On the bilateral thighs and knees, there were confluent, waxy pink indurated plaques demonstrating the Shar Pei sign with surrounding pink macules and papules.

DERMATOPATHOLOGY

Histologic sections from punch biopsies of the right dorsal hand and left knee showed mucin deposition with Alcian blue staining, increased collagen, and irregularly arranged fibroblasts in the dermis. CD68 immunostaining showed scattered histiocytes.

ADDITIONAL STUDIES

Free serum lambda light chain was elevated at 51.1 (5.7 – 26.3 mg/L), free serum kappa light chain was elevated at 27.7 (3.3 – 19.4 mg/L), free serum kappa/lambda light chain ratio was normal at 0.54 (0.26 – 1.65). Serum immunofixation showed 3 abnormal restricted bands (IgG kappa monoclonal protein with 1 restricted band in anodal gamma region and 1 in mid gamma region & IgG lambda monoclonal protein with 1 restricted band in cathodal gamma region). Fluorescence *in situ* hybridization (FISH) on bone marrow aspirate enriched for plasma cells was abnormal with IGH/MAFB rearrangement. Bone marrow cytogenetic studies showed normal karyotype with no consistent numerical or structural chromosome abnormalities. Serum protein electrophoresis (SPEP) was unremarkable, with no gamma-globulin or M-protein spike. Bone marrow biopsy was unremarkable and bone marrow flow cytometry studies showed normal cell percentages, including plasma cells. CBC, CMP, and serum immunoglobulin G were unremarkable.

DIAGNOSIS

Scleromyxedema with systemic symptoms

TREATMENT AND COURSE

The patient developed neutropenia and discontinued lenalidomide. He had increasing free serum lambda and kappa light chain levels and worsening skin findings and was started on bortezomib with significant improvement. However, within two months, the patient developed worsening motor and sensory symptoms of the bilateral lower extremities. The patient discontinued bortezomib, known to cause a painful axonal sensory-predominant length-dependent peripheral neuropathy in 30-40% of patients. However, after discontinuation, the patient continued to have worsening strength, pain with tingling, sensitivity to touch, and back pain. EMG showed severe axonal demyelinating polyneuropathy. He also developed left hand weakness and was diagnosed with carpal tunnel syndrome.

DISCUSSION

Scleromyxedema is a chronic dermal mucinosis with firm papules and indurated areas due to increased dermal mucin and collagen. Patients almost always have a monoclonal gammopathy, typically IgG lambda. Although a mild plasmacytosis may be observed in bone marrow biopsies, fewer than 10% of patients progress to symptomatic myeloma. Patients may have systemic findings, which can progress and be lethal. Patients with scleromyxedema can have a number of internal manifestations, in particular muscular, neurologic, rheumatologic, pulmonary, renal and cardiovascular. Dysphagia, proximal muscle weakness due to myositis, CNS disturbances leading to unexplained coma known as dermato-neuro syndrome, peripheral neuropathy, arthropathies, carpal tunnel syndrome, restrictive or obstructive lung disease, and scleroderma-like renal disease may occur. It was concluded that the patient's peripheral neuropathy was due to scleromyxedema, with possible exacerbation by bortezomib.

Our patient had classic skin and histological findings of scleromyxedema, elevated serum light chains, abnormal serum immunofixation, and an IGH/MAFB t(14;20)(q32;q12) rearrangement in a population of bone marrow plasma cells. In addition, prior to bortezomib therapy, the patient had progressively worsening peripheral neuropathy and carpal tunnel syndrome, not otherwise explained by other causes, and was diagnosed with scleromyxedema with systemic symptoms. Given adverse side effects to dexamethasone, lenalidomide, and bortezomib, future considerations for treatment include IVIg and/or autologous hematopoietic stem cell transplantation (HSCT).

Interestingly, the patient's translocation(14;20) is a poor prognostic factor in myeloma but is associated with long-term stable disease in monoclonal gammopathies of undetermined significance. The t(14;20)(q32;q12) is the rarest of the five most common translocations in myeloma that involve the IGH gene and is found in about 1% of all myeloma cases. The patient's biopsy showed the classic pattern of scleromyxedema with a triad of microscopic features: diffuse mucin deposition in the upper and mid reticular dermis, increased collagen, and a proliferation of irregularly arranged fibroblasts.

Initial laboratory evaluation of a suspected clonal plasma cell disorder includes SPEP and immunofixation, free light chain assays, and quantitative immunoglobulins. If a monoclonal protein is detected, 24 hour urine collection for urine protein electrophoresis and immunofixation should be performed, along with referral to hematology/oncology for potential bone marrow studies. The patient's SPEP, and bone marrow biopsy and flow cytometry studies were unremarkable, without evidence of plasma cell dyscrasia. However, not uncommonly, assessment may not detect a tiny clonal population within a polyclonal background. It is important to utilize multiple diagnostic methods when suspecting a plasma cell dyscrasia .

Scleromyxedema has an unpredictable but usually progressive, disabling course if left untreated. First line treatment includes maintenance infusions of IVIg, alone or in combination with thalidomide (or lenalidomide) and/or systemic corticosteroids. Autologous HSCT is indicated in individuals with disabling or potentially life-threatening disease. Post-transplant recurrences can be treated with bortezomib plus dexamethasone. Monitoring serologic levels of the associated monoclonal gammopathy may not correlate with disease activity. Patients should be counseled that neurologic symptoms like dysarthria and flu-like illness may be the initial signs of dermato-neuro syndrome and requires hospital admission.

We present this case of scleromyxedema with multiple treatment failures and worsening systemic disease for clinical interest.

REFERENCES

Andreas A. Argyriou, Gregoris Iconomou, Haralabos P. Kalofonos; Bortezomib-induced peripheral neuropathy in multiple myeloma: a comprehensive review of the literature. Blood 2008; 112 (5): 1593–1599.

Brunet-Possenti F, Hermine O, Marinho E, et al: Combination of intravenous immunoglobulins and lenalidomide in the treatment of scleromyxedema. J Am Acad Dermatol 2013; 69: pp. 319-320

Li, T, Timmins, HC, King, T, Kiernan, MC, Goldstein, D, Park, SB. Characteristics and risk factors of bortezomib induced peripheral neuropathy: A systematic review of phase III trials. Hematological Oncology. 2020; 1– 15.

Mark A Micale t(14;20)(q32;q12) IGH/MAFB in Plasma Cell Myeloma Atlas Genet Cytogenet Oncol Haematol. 2019;23(8):230-233.

Rongioletti F, Cozzani E, and Parodi A: Scleromyxedema with an interstitial granulomatous-like pattern: a rare histologic variant mimicking granuloma annulare. J Cutan Pathol 2010; 37: pp. 1084-1087

Rongioletti F, and Rebora A: Cutaneous mucinoses: microscopic criteria for diagnosis. Am J Dermatopathol 2001; 23: pp. 257-267

Rongioletti F, and Rebora A: Updated classification of papular mucinosis, lichen myxedematosus, and scleromyxedema. J Am Acad Dermatol 2001; 44: pp. 273-281

Rongioletti F, Merlo G, Cinotti E, et al: Scleromyxedema: a multicenter study of characteristics, comorbidities, course, and therapy in 30 patients. J Am Acad Dermatol 2013; 69: pp. 66-72

Chicago Dermatological Society **Case #8**

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HISTORY OF PRESENT ILLNESS

An 87-year-old male with PMH of CAD, CHF with pacemaker, atrial fibrillation, recent TIA/embolic stroke, diabetes mellitus and dementia presented to OSH with new erythematous desquamating rash. The patient was alert and oriented to self, but confused, which was his baseline per family. The patient lived in a nursing home and had a chronic indwelling foley catheter. In the week prior to admission the patient was admitted to OSH for urosepsis and treated with Zosyn for 4 days. He also had a CT scan, but per records did not receive any IV contrast. The patient also received a 5-day course of levofloxacin approximately one month prior to admission per family. They denied other new medications or supplements. Per family, the rash started several days prior to admission, the patient was noted to have an erythematous rash on palms and soles. The rash then progressed to include the intertriginous areas in the groin, inguinal folds and buttocks. The patient's skin then started to slough off in some areas and due to progression of rash the patient presented to OSH ED. The patient was also noted to have several crusted erosions in the perioral region, per family these appeared separately from the rash of concern. Due to initial concern for SJS/TEN patient was transferred to Loyola Burn ICU for further evaluation.

PAST MEDICAL HISTORY

Coronary artery disease s/p stents
Congestive heart failure
Atrial fibrillation
TIA/stroke
Diabetes Mellitus
Dementia

MEDICATIONS

Eliquis
Insulin glargine and lispro
Losartan
Tamsulosin
Finasteride

Zosyn
Levofloxacin

ALLERGIES

No known drug allergies

FAMILY HISTORY

None pertinent

SOCIAL HISTORY

Resides in a nursing home

PHYSICAL EXAMINATION

The patient was well appearing. On the lower cutaneous lip and cutaneous left nasal alar rim there were two small, crusted erosions. No lesions on the oral, ocular or nasal mucosa were noted. The bilateral palms and soles had full thickness sloughing and denuded skin. The chest was noted to have pink scaly papules. On the buttocks there was diffuse erythema, with erosions over the posterior thighs and sacrum. The lower abdomen, bilateral upper medial thighs and groin had diffuse erythema with exanthematous papules coalescing into plaques. There were unroofed bulla and erosions on the right thigh and medial thighs bilaterally. There was erythema on the glans with evidence of trauma to the urethral meatus and glans from a foley catheter that was in place.

DERMATOPATHOLOGY

Histologic sections from initial punch biopsy showed robust interface dermatitis with basal vacuolar change and apoptotic keratinocytes. The dermis showed lymphocytic superficial perivascular inflammation with scattered eosinophils. Direct immunofluorescence was negative.

ADDITIONAL STUDIES

A complete metabolic panel was notable for elevated creatinine at 1.41 (0.6-1.4 mg/dL), glucose elevated at 200 (70-100 mg/dL), urinalysis notable for moderate blood, 2+ protein. HSV 1 and 2 PCR positive for HSV 1 from the lip. Complete blood count was unremarkable.

DIAGNOSIS

SDRIFE- Symmetrical drug related intertriginous and flexural exanthem

TREATMENT AND COURSE

Zosyn was held. The patient was started on triamcinolone 0.1% ointment twice daily to erythematous unopened skin, and bacitracin/zinc ointment twice daily to open desquamated skin. Supportive care with frequent application of Vaseline or Aquaphor was performed. All areas of open skin were covered with non-stick dressings. The patient was also treated with a course of Valtrex for HSV infection in perioral region.

DISCUSSION

SDRIFE or symmetrical drug related intertriginous and flexural exanthem is a rare drug eruption seen most commonly on the gluteal and intertriginous areas following exposure to systemic medications. SDRIFE was previously referred to as baboon syndrome due to the distribution of the lesions. The term SDRIFE was proposed in 2004 as a more appropriate terminology for the eruption. The proposal for the use of SDRIFE also included the important fact that this reaction to systemic medication can occur regardless of prior sensitization with the offending medication.

Classically, SDRIFE presents as sharply demarcated V-shaped erythema in the intertriginous and gluteal region. It usually presents hours to days following exposure. There are five criteria for the diagnosis of SDRIFE, these include 1) occurrence after exposure to a systemic drug at first or repeated dose, 2) sharply demarcated erythema of the gluteal region or V-shaped erythema of the inguinal region, 3) involvement of at least one other intertriginous flexural fold, 4) symmetry of the involved areas, and 5) absence of systemic symptoms. The drug eruption classically occurs

following exposure to amoxicillin, ceftriaxone, penicillin, clindamycin, erythromycin or iodinated contrast media. There is a male predominance of cases and it can present at any age. The pathophysiology of the eruption is unknown; however, it is suspected that it develops as a result of a type IV delayed hypersensitivity immune response with evidence of T-cell-mediated reaction. However, this proposed mechanism does not explain the occurrence of SDRIFE following initial exposure to a given drug without prior sensitization in many cases.

Histologically the findings of SDRIFE are variable. Classically one can see a superficial perivascular inflammation with mononuclear infiltrate. There are reports of hyperkeratosis, spongiosis, subcorneal pustules, basal layer vacuolar changes and hydropic degeneration and papillary dermal edema as well.

The differential diagnosis includes fixed drug eruption, systemic contact dermatitis, and toxic erythema of chemotherapy. Diagnosis relies heavily on clinical presentation, history, and lack of systemic findings. Treatment consists of discontinuing the offending medication or agent. Supportive care with topical or systemic corticosteroids is also advised. Antihistamines can be used to decrease pruritus. The eruption usually resolves without long term sequalae.

We present this care to highlight a presentation of SDRIFE in an 87-year-old male patient after exposure to piperacillin-tazobactam for clinical interest.

REFERENCES

Andersen K E, Hjorth N, Menné T. The baboon syndrome: systemically induced allergic contact dermatitis. *Contact Dermatitis* 1984: **10**: 97– 100

Arnold AW, Hausermann P, Bach S, Bircher AJ. Recurrent flexural exanthema (SDRIFE or baboon syndrome) after administration of two different iodinated radio contrast media. Dermatology (Basel). 2007;214(1):89-93.

de Risi-Pugliese T, Barailler H, Hamelin A, et al. Symmetrical drug-related intertriginous and flexural exanthema: A little-known drug allergy [published online ahead of print, 2020 May 4]. *J Allergy Clin Immunol Pract*. 2020;S2213-2198(20)30411-6. doi:10.1016/j.jaip.2020.04.052

Handisurya A, Stingl G, Wöhrl S. SDRIFE (baboon syndrome) induced by penicillin. *Clin Exp Dermatol*. 2009;34(3):355-357. doi:10.1111/j.1365-2230.2008.02911.x

Harbaoui S, Litaiem N. Symmetrical Drug-related Intertriginous and Flexural Exanthema (SDRIFE). In: *StatPearls*. Treasure Island (FL): StatPearls Publishing; 2020.

Häusermann P, Harr T, Bircher AJ. Baboon syndrome resulting from systemic drugs: is there strife between SDRIFE and allergic contact dermatitis syndrome?. *Contact Dermatitis*. 2004;51(5-6):297-310. doi:10.1111/j.0105-1873.2004.00445.x

Huynh, Thy, et al. “Systemic Drug-Related Intertriginous and Flexural Exanthema from Radio Contrast Media: A Series of 3 Cases.” *JAAD Case Reports*, vol. 1, no. 3, 2015, pp. 147–149., doi:10.1016/j.jdcr.2015.03.007.

Nanda, Shivani, and Holly Kerr. “A Case of SDRIFE Induced by Fluconazole.” *Journal of the American Academy of Dermatology*, vol. 74, no. 5, 2016, doi:10.1016/j.jaad.2016.02.351.

Sans V, Jouary T, Hubiche T, Smith D, Milpied B, Taieb A. Baboon Syndrome Induced by Cetuximab. *Arch Dermatol.* 2008;144(2):272–274. doi:10.1001/archdermatol.2007.57

Winnicki M, Shear NH. A systematic approach to systemic contact dermatitis and symmetric drug-related intertriginous and flexural exanthema (SDRIFE): a closer look at these conditions and an approach to intertriginous eruptions. *Am J Clin Dermatol*. 2011;12(3):171-180. doi:10.2165/11539080-000000000-00000

Chicago Dermatological Society **Case #9**

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Patient 1

HISTORY OF PRESENT ILLNESS

A 32-year-old male with history of orolabial HSV presented to his primary care physician with new growth on his lower mucosal lip that arose at the site of a healing cold sore and rapidly increased in size. He was diagnosed clinically with a pyogenic granuloma per his PCP and treated with silver nitrate twice and timolol 0.5% drops BID per his primary. The lesion stabilized in size but failed to involute. Due to national VA guidelines regarding clinic restrictions during the COVID-19 pandemic, he was finally seen in dermatology clinic 8 weeks following onset of the growth with a ~3cm, red exophytic growth on the lower mucosal lip.

PAST MEDICAL HISTORY

Orolabial HSV

MEDICATIONS

Timolol maleate 0.5% drops BID

ALLERGIES

No known drug allergies

FAMILY HISTORY

No pertinent family history

SOCIAL HISTORY

No pertinent social history

PHYSICAL EXAMINATION

The patient was well-appearing. On the right lower mucosal lip there was a ~3cm, red exophytic growth on a central stalk. No other abnormalities were noted on exam of the face and oral mucosa.

DERMATOPATHOLOGY

Histologic sections from the specimen showed a large, irregular proliferation of capillary lobules with variably sized endothelial cells. The capillary lobules were separated by an edematous and fibrotic stroma with perivascular inflammation.

DIAGNOSIS

Pyogenic granuloma

TREATMENT AND COURSE

The lesion was surgically removed via shave excision with electrodessication of the base, which was well tolerated by the patient. At his two month virtual dermatology follow-up, the area had healed without signs of recurrence or impaired function and with good cosmetic outcome.

Patient 2

HISTORY OF PRESENT ILLNESS

A 71-year-old male presented to the emergency department with 2 days of pruritus and rash on the left arm. The patient reported that he had been gardening without gloves and later that night developed pruritus along his left arm. The following day, he presented to the emergency department where documentation noted multiple pustules and erythematous nodules on the left hand and wrist, extending up the left arm. A culture of a pustule was obtained for fungal and bacterial organisms. He was started on PO itraconazole 200mg BID for presumed sporotrichosis. Dermatology did not evaluate the patient at this time and was paged to arrange virtual follow up due to clinic restrictions during the COVID-19 pandemic.

The following day the patient was contacted to arrange a virtual dermatology consult, but as he did not have access to a smart phone or computer with webcam, an audio only visit was done. He confirmed the HPI as reported by the ED. Given the inability to visually evaluate the patient, the patient was agreeable to continue current medical management and await pending culture results.

Four days later the patient re-presented to the ED with worsening pain and burning sensation in his left arm. He also reported developing new lesions up his left arm and back. At this time, he was evaluated by dermatology in person. He denied fevers, chills and was otherwise in good health.

PAST MEDICAL HISTORY

Allergic contact dermatitis, benign prostatic hypertrophy

MEDICATIONS

Itraconazole 200mg BID, ibuprofen 400mg TID PRN, finasteride, tamsulosin

ALLERGIES

No known drug allergies

FAMILY HISTORY

No pertinent family history

SOCIAL HISTORY

Current smoker (1 pack per week), retired, lives with wife, enjoys gardening.

PHYSICAL EXAMINATION

Uncomfortable but otherwise well-appearing and afebrile. There were scattered, intact, grouped vesicles on an erythematous base and heme crusted erosions on the left superior back, left shoulder, and left arm extending distally to the dorsal hand in a dermatomal distribution.

ADDITIONAL STUDIES

A complete blood count and complete metabolic panel were within normal limits. Fungal and bacterial cultures failed to grow organisms.

DIAGNOSIS

Herpes Zoster

TREATMENT AND COURSE
The patient was instructed to stop itraconazole and treated for herpes zoster with PO valacyclovir 1g TID x 7 days. Due to concern for post-herpetic neuralgia he was started on gabapentin 100mg QHS x 1 day, 100mg BID x 1 day, then 100mg TID. Periodic follow up was done via telephone visits and patient reported resolution of his rash but persistent, sharp pain from his left hand to the upper arm as well as numbness in his left hand. He was incrementally increased to gabapentin 600mg TID and started topical capsaicin 0.75% TID. Gradually his dysesthesias improved, and gabapentin was stopped after 8 weeks.

Patient 3
HISTORY OF PRESENT ILLNESS
A 55-year-old male with a history of non-small cell adenocarcinoma of the lung status post chemotherapy with paclitaxel and carboplatin and concurrent radiation therapy presented to the emergency department with 1-2 weeks of pruritus and rash. The patient thought the rash started on his chest, spreading over his body, sparing the head, neck, palms, and soles. Pruritus was intense and constant. There were no new skin care products or medications. He denied fevers, chills, malaise, cough, shortness of breath or other systemic symptoms. Dermatology reviewed images obtained in the emergency department which were suggestive of a resolving exanthematous eruption of unknown etiology. He was started on triamcinolone 0.1% cream BID and cetirizine 5mg QHS with scheduled follow up. Due to transportation issues during the COVID-19 pandemic, he was briefly lost to follow up.

The patient presented to clinic 3 weeks later with rash and pruritus consistent from prior. On exam he was noted to have superficial scaling of the palms, wrists and interdigit web spaces. He endorsed worsening of his symptoms and pruritus was now interfering with his sleep.

PAST MEDICAL HISTORY
Stage IIIB non-small cell adenocarcinoma of the lung, polysubstance use, hepatic steatosis and alcoholic hepatitis, vitamin B12 deficiency with polyneuropathy.

MEDICATIONS
Triamcinolone 0.1% cream BID, cetirizine 5mg QHS, prochlorperazine, docusate/sennosides, polyethylene glycol

ALLERGIES
No known drug allergies

FAMILY HISTORY
Mother with lung cancer (type unknown), sister with thyroid cancer (unknown type)

SOCIAL HISTORY
History of tobacco (40 pack years, quit following cancer diagnosis), cannabis, and alcohol use (quit following cancer diagnosis). Previously homeless, living alone in VA provided housing.

PHYSICAL EXAMINATION

Evaluation of images provided by the ED were reviewed. The patient had diffuse eczematous papules with areas of fine white scale over the chest, back, bilateral arms and thighs. Scattered pustules were noted on the back. Follow up in person exam: Uncomfortable. Diffuse eczematous papules on the chest, back, abdomen, bilateral arms and legs sparing the face. There was superficial scaling on the palms and soles with involvement of several interdigit spaces.

ADDITIONAL STUDIES

A complete blood count demonstrated a decreased white blood count at 3.9 (4-11K/μL), decreased red blood count at 3.5 (4.2-5.70 M/μL), normal hemoglobin of 13.1 (13-17 gm/dL) and decreased hematocrit at 37.6 (40-51%). No peripheral eosinophilia noted. Mineral oil scraping of the right wrist and palm was positive for scabies mites, scybala and eggs.

DIAGNOSIS

Scabies

TREATMENT AND COURSE

The diagnosis of scabies was made following mineral oil scraping, which revealed mites, scybala and eggs. The patient was started on PO Ivermectin 12mg (200 mcg/kg) once weekly x 2 weeks. His rash improved but pruritus persisted for an additional 4 weeks. He was instructed to camphor lotion as needed and his symptoms eventually resolved.

DISCUSSION

The COVID-19 pandemic has put an unprecedented strain on the healthcare system and necessitated the expansion of virtual healthcare services. Teledermatology has shown promise for improving access to dermatologic care, but it is also apparent that face to face visits remain essential for select patient encounters. We present three teledermatology consults from our clinic during the COVID-19 pandemic where delay in diagnosis and/or treatment negatively impacted our patients.

Like many academic institutions, our clinic followed AAD and national VA guidelines to close outpatient clinics, cancel elective procedures and delay, whenever safely possible, all other procedures at the onset of the COVID-19 pandemic. However, we did maintain a staffed clinic in an attempt to triage patients and deliver care virtually. Triaging consults and balancing quality patient care with social distancing guidelines necessitated frequent, difficult decisions.

At the beginning of the COVID-19 pandemic teledermatology filled an important role in expanding dermatologic care to patients with both acute and chronic medical concerns. As the pandemic progresses, virtual care will continue to play an essential part of future practice. There is need for a streamlined approach to triage and evaluate patients. Each practice's approach may be tailored but common resources and mechanisms can be utilized – such as "store and forward" or asynchronous review of high-quality images as well as "live-interactive" video formats. Asynchronous review involves a dermatologist evaluating still images and responding with recommendations at a later time. This method provides an efficient and cost-effective way to

triage consults or manage routine follow-up but is hindered by misdiagnosis due to poor photo quality, communication gap between the dermatologist and patient or primary care provider, and an inability to carry out diagnostic procedures. Live-interactive or synchronous video visits can yield an accurate history and an interactive format through real-time patient interactions; but are limited by patient technological capabilities, image quality, and require redundant care for those patients requiring diagnostic or therapeutic procedures.

COVID-19 has necessitated advancements in virtual care; still there remains a need for in personal evaluation and management by skilled clinicians. Virtual evaluations continue to remain a challenge for certain patient populations unable or unwilling to participate as well as various diagnoses and treatments, such as conditions necessitating a biopsy. We present this case series to highlight the balance of virtual dermatology services with in-person evaluation by a skilled clinician for accurate diagnosis and definitive treatment. Additionally, we hope that our experiences assist other clinicians in reflection and implementation of improved virtual dermatologic care.

REFERENCES

Bressler M. et al. Vitual Dermatology: A COVID-19 Update. *Cutis*. 2020; 105(4): 163-165

Chandler D. et al. A Review of Scabies: An Infestation More than Skin Deep. *Dermatology*. 2019; 235: 79-90

Jafarzadeh H, et al. Oral Pyogenic Granuloma: a review. *Journal of Oral Science.* 2006; 48(4): 167-175

Kumar S. et al. Changing paradigms of dermatology practice in developing nations in the shadow of COVID-19: Lessons learnt from the pandemic. *Dermatologic Therapy.* 2020; e13472

Lee I. et al. Telehealth: Helping your patients and practice survive and thrive during the COVID-19 crisis with rapid quality implementation. *J Am Acad Dermatol.* 2020; 82(5): P1213-1214

Mayra B. et al. Benign oral mucosal lesions: Clinical and pathological findings. *J Am Acad Dermato.* 2019; 81(1): 43-56

Pathoulas J. et al. Ethical outpatient dermatology care during the coronavirus (COVID-19) pandemic. *J Am Acad Dermatol.* 2020; 82(5): 1272-1273

Richie L. et al. Pyogenic Granuloma. *Cutis*. 2004; 74: 229-233

Saguil A. et al. Herpes Zoster and Postherpetic Neuralgia: Prevention and Management. *American Family Phyisian*. 2017; 96(10): 656-663

Shah P. et al. Teaching Lessons from the Coronavirus Disease 2019 (COVID-19) Pandemic in Telemedicine. *Journal of Drugs in Dermatology*. 2020; 19(6): 677

Temiz S. Evaluation of Dermatology Consultionats in the era of COVID19. *Dermatologic Therapy*. 2020; e13642

Thompson M. et al. Systematic review of the diagnosis of scabies in therapeutic trials. *Clinical and Experimental Dermatology*. 2017; 42: 481-487

Thomas C. et al. Scabies. *J Am Acad Dermatol.* 2017; 82(3): 533-548

Wang R. et al. Clinical effectiveness and cost-effectiveness of teledermatology: Where are we now, and what are the barriers to adoption? *J Am Acad Dermatol.* 2020; 83(1): 299-307

Weinberg J. Herpes zoster: Epidemiology, natural history, and common complications. *J Am Acad Dermatol*. 2007; 57(6): 130-135

Yiping Gan E. et al. Management of Herpes Zoster and Post-Herpetic Neuralgia. *Am J Clin Dermatol*. 2013; 14: 77-85