CLINICAL PRACTICE

*Exercises in Clinical Reasoning***Empathy as a Diagnostic Tool in a 33-Year-Old Man with Eye Pain and Vision Loss: Exercises in Clinical Reasoning**Reaford Blackburn, Jr., M.D.¹, Carlos A. Estrada, M.D., M.S.^{2,3}, and David McCollum, M.D.³¹Tinsley Harrison Internal Medicine Residency Program, University of Alabama at Birmingham, Birmingham, AL, USA; ²Birmingham Veterans Affairs Medical Center, Birmingham, AL, USA; ³The University of Alabama at Birmingham, Birmingham, AL, USA.

KEY WORDS: clinical reasoning; empathy; uveitis; syphilis; HIV infection.

J Gen Intern Med 31(11):1389–92

DOI: 10.1007/s11606-016-3797-9

© Society of General Internal Medicine 2016

In this series, a clinician extemporaneously discusses the diagnostic approach (*regular text*) to sequentially presented clinical information (**bold**). Additional commentary on the diagnostic reasoning process (*italics*) is integrated throughout the discussion.

Clinical Information. A 33-year-old African-American man presents with 2 weeks of progressive left eye pain and vision loss without preceding trauma. The pain is severe, sharp, and constant. He sought medical attention when he could no longer distinguish light or movement with his left eye.

The first thought that comes to mind in an elderly person with unilateral progressive subacute eye pain and vision loss is glaucoma. However, because he is not elderly, acute glaucoma is less likely. Rarely, a young person can present with glaucoma due to uveitis. For an object to be "visible" in our brains, it has to travel through several layers: cornea, anterior chamber, lens, posterior chamber, vitreous body, retina, optic nerve, optic radiation, and visual cortex. With unilateral pain and vision loss, the problem originates within the eye or the optic nerve (up to the chiasm).

Starting with the cornea, a foreign body with superimposed infection or herpes keratitis can present with severe pain and progressive vision loss, although near blindness would be unusual. I would ask about his occupation or hobbies involving potential foreign bodies. For example, construction workers are at risk for wood and metal fragments becoming embedded in the cornea. With a foreign body, blinking will typically worsen the pain. Moving to the anterior and posterior chambers, I would consider uveitis. Because sarcoidosis is more prevalent in African-American patients in the USA, I would

ask about other findings such as arthritis, shortness of breath, skin abnormalities, and diplopia. Reactive arthritis is also associated with ocular and skin manifestations including balanitis circinata (circumferential annular dermatitis of the glans penis) or keratoderma blennorrhagica (psoriasiform lesions of the palms and soles). Moving to the lens, I cannot think of anything that would present like this. Finally, we should consider diseases of the vitreous body, or endophthalmitis. Fungal endophthalmitis may occur in patients who have received parenteral nutrition via central venous catheterization. Progressive outer retinal necrosis due to herpes zoster infection can cause retinal detachment and bleeding into the vitreous body.

My next step would be to focus on trying to identify the anatomical location of the problem: cornea, anterior or posterior chamber, or vitreous/retina. A detailed physical examination will be essential, particularly of the eye.

Diagnostic reasoning is often divided into type 1 (intuitive) and type 2 (analytical) systems of thinking.¹ Type 1 thinking is effortless and automatic. Using this system, diagnoses can be made efficiently, and the clinician can transition his or her cognitive efforts to other considerations. Type 2 thinking is needed when type 1 thinking does not immediately provide a diagnosis. Type 2 thinking consists of careful reasoning into a patient's presentation and the diagnostic possibilities; it is deliberate, slow, and requires considerable effort.

Internists are usually quite comfortable with complicated medical problems when the pathological process includes their "bread and butter" organ systems such as the heart, lungs, or kidneys. They often have well-developed "illness scripts" for many conditions that can be quickly retrieved when encountering patients with suggestive signs and symptoms. Many diagnoses are readily retrieved using type 1 (intuitive) thinking when the problem lies in these organ systems. Internists may be less comfortable with pathology related to other organ systems such as skin (dermatology), brain and nervous system (neurology), and eyes (ophthalmology). In such instances, illness scripts may be less developed and fewer in number, requiring a shift to type 2 (analytical) thinking.

Our discussant develops a problem representation—unilateral progressive subacute eye pain and vision loss—and reflexively searches his immediate memory for corresponding illness scripts (type 1 thinking). Acute glaucoma is the available illness script; however, the patient's young age precludes the common causes of glaucoma. Hence he converts to type 2 (analytical) thinking.

Received March 7, 2016

Revised May 26, 2016

Accepted June 23, 2016

Published online July 25, 2016

Specifically, he uses his knowledge of anatomy to consider the diagnostic possibilities.

He denied diplopia, diarrhea, dysuria, arthritis, or new drug exposure. His history included hospitalizations for suicidal ideation, homicidal ideation, and depression. He was originally diagnosed with HIV in 2001 while in prison. He had sporadic interactions with the local HIV clinic but had never regularly received highly active antiretroviral therapy (HAART). Other medical problems include hepatitis C infection and a history of gonorrhea. He was not taking any medications.

The patient's immunocompromised state changes the differential diagnosis. I would look up whether cytomegalovirus (CMV) infection can present this way (if herpes retinitis can, it is likely CMV can). The illness "context" is important, and appears to have been both chaotic and dysfunctional. Psychosocial barriers to care in patients with HIV are well documented. I cannot imagine the difficulties he must have endured along the way. In any case, relieving his suffering is a priority and could be accomplished via controlling his pain and diagnosing the current condition.

He has had multiple sexually transmitted infections, and I wonder about the adequacy of his prior treatment for gonorrhea. However, I cannot establish a link between hepatitis C or gonorrhea and the eye (gonococcal conjunctivitis is seen in newborns and is usually bilateral).

At this point a major contextual clue is revealed, namely that the patient has HIV with nonadherence to HAART. Interestingly, this insight opens the discussant's medical memory (several opportunistic infections are mentioned) and his empathy (prioritizing relief of suffering and inferring the patient's past emotional dysfunction and trauma). Encountering patients with advanced forms of potentially treatable chronic illnesses (e.g. HIV, diabetes) is often quite memorable to providers, although their response may vary. Many feel a sense of futility about further medical interventions due to the chronicity of nonadherence, and emotionally disengage from the patient. This discussant takes the path of empathy, reflected by the comment, "I cannot imagine the difficulties he must have endured along the way." The discussant understands that prior adverse experiences may have contributed to the patient's current self-destructive choices, i.e. nonadherence to life-saving medications.² The discussant's empathy leads to an appreciation of the complexity of the patient and galvanizes his search for a diagnosis.

He denies recent travel and works as a local hairstylist. He has a remote history of cocaine and marijuana use. He engages in unprotected receptive anal intercourse with multiple male partners.

Unprotected sex predisposes the patient to syphilis, chlamydia, gonorrhea, and other sexually transmitted infections. HIV transmission to non-infected partners presents an additional public health issue. While he does not report injection drug use, I would keep infective endocarditis in the back of my mind, since bacteremia can seed the eye, resulting in endophthalmitis.

On physical examination, his blood pressure was 110/70 mmHg, heart rate was 70 beats per minute, respiratory rate was 16 breaths per minute, and his temperature was 100.2 °F (37.9 °F). He declined to change into a hospital gown for the exam and was in moderate distress due to left eye pain, carefully keeping his gloved hands covering his left eye. He was an otherwise thin, chronically ill-appearing man with temporal wasting and a few areas of alopecia on his scalp. (Fig. 1)

He appears to be in physical and possibly emotional pain. Why are his hands gloved? Is he cold? Is he scared or ashamed about something that lies underneath? Is he in denial about his illness? With untreated HIV for years, could he now have developed cutaneous Kaposi's sarcoma? The patchy alopecia is intriguing; it could be a sign of systemic illness (syphilis), skin infection (tinea capitis), or emotional distress (trichotillomania). This initial exam is incomplete, and limits our ability to gather information and to interpret. If he allows, I would closely examine the areas of alopecia (for example, the underlying skin would be abnormal in tinea capitis).

While infections less commonly cause uveitis in the general population, given the context of untreated HIV, the discussant has appropriately shifted his diagnostic considerations almost entirely to infectious diseases. Again the discussant empathizes with the patient, possibly remembering similar patients. Dominant emotions may include suffering, stigma, and pain. While he cannot change the patient's past, the discussant realizes he can relieve suffering by correctly diagnosing the current condition. He realizes that the alopecia is a possible clue that will unify the patient's presentation and diagnosis, and thus seeks a more thorough examination. Completing the physical exam is an integral part of the clinical reasoning process.³ The patient's dress and mannerisms suggest reluctance to allow a thorough exam, but the clinician wisely perseveres in obtaining permission for a full exam. "Failure/delay in eliciting critical physical exam finding" was a prominent reason for diagnostic error in an investigation of 583

Figure 1 Areas of patchy alopecia.

physician-reported errors.⁴ In this report, errors occurred in the testing phase (44 %), during the clinicians' assessment (32 %, did not consider a competing diagnosis), history taking (10 %), physical exam (10 %), and consultation (3 %).⁴

Clinical judgment and sensitivity will be needed to encourage the patient to allow this exam. The Institute of Medicine, in their recent report *Improving Diagnosis in Health Care*, acknowledges the need for this clinical skill: "Clinicians need to know when to ask more detailed questions and how to create a safe environment for patients to share sensitive information about their health and symptoms. Obtaining a history can be challenging in some cases, for example, in working with older adults with memory loss, with children, or with individuals whose health problems limit communication or reliable self-reporting."³

Examination of the left eye, although limited by pain, revealed a hypopyon with marked scleral injection. Visual acuity testing showed minimal light perception, and the patient could not recognize shadows. Extraocular movements were intact. The right eye was normal. Urgent ophthalmology evaluation confirmed severely impaired visual acuity, hypopyon, and pan uveitis.

Hypopyon is an ophthalmological emergency. However, I would also immediately and safely address the patient's pain. Since bacterial endocarditis is still possible, I would obtain blood cultures and consider starting broad-spectrum antibiotics. I would ask our ophthalmology and infectious disease colleagues about the utility of sampling the anterior chamber for culture. Once his pain is addressed, I would go back, and after continuing to strengthen the rapport, gently insist on a more complete exam. I would order basic laboratory testing, serology, and other tests (blood counts, chemistry, HIV viral load, RPR, and treponemal antibody test).

In summary, he is a young man with untreated HIV (possibly AIDS) and high-risk sexual behavior, presenting with unilateral subacute eye pain and vision loss due to pan-uveitis and patchy alopecia. The physical exam is incomplete.

The discussant's problem representation has become much richer. The context of uncontrolled HIV infection, prior sexually transmitted infections, uveitis, and patchy alopecia bring the discussant to the brink of a unifying diagnosis. The discussant "knows what he doesn't know," e.g. whether sampling of the anterior chamber should be pursued. Once the patient's immunocompromised state is revealed, the discussant immediately considers CMV. He again emphasizes the need for a complete exam. In a study among 41 internal medicine residents, "failing to elicit all relevant information in establishing a diagnosis" was noted in 54 % of the narratives as a cause of diagnostic error.⁵ In another study in primary care practices, 90 of 190 diagnostic errors reviewed (40 %) were deemed related to the physical examination.⁶

The patient was persuaded to remove his socks and gloves. His palms and soles showed multiple hyperpigmented macular and papular discolored lesions with a thin white ring of scale known as Biett's collarette (Fig. 2). He was unsure how long the rash had been present but

Figure 2 Skin rash involving palms and soles.

mentioned it caused him significant anxiety, contributing to his reluctance to remove his socks and gloves, or even seek medical attention. The pulmonary and cardiovascular exams were normal.

The presence of the rash is again a clue to a more systemic cause of eye findings. With his high-risk sexual behavior and rash on the palms and soles, syphilis becomes much higher on the differential diagnosis. I would need to review and ask our infectious disease colleagues whether syphilis alone could explain severe uveitis. Syphilis can be a great masquerader.

Initial laboratory values include sodium 139 mEq/L, potassium 4.4 mEq/L, chloride 106 mEq/L, bicarbonate 26 mEq/L, urea nitrogen 26 mg/dL, creatinine 0.8 mg/dL. White blood count 6,100 cells/cm³, hemoglobin 13.6 g/dL, platelets 252,000/cm³. Albumin 3.3 g/dL, total protein of 8.8 g/dL, alkaline phosphatase 92 units/L, aspartate aminotransferase 46 units/L, and alanine aminotransferase 30 units/L. Rapid plasma reagin (RPR) titer was 1:2,048. His sexual history, characteristic rash, and markedly elevated RPR confirms the diagnosis of syphilis with ocular involvement. He received intravenous (IV) penicillin G, with rapid resolution of the hypopyon and gradual improvement of left eye pain and visual loss. Unfortunately, however, the patient was lost to follow-up after antibiotic treatment.

DISCUSSION

While some assume that doctors perform diagnostic reasoning with cold rationality, the reality is that one's emotional state

affects decision-making.^{7,8} It is important to consider not only how a doctor thinks, but how a doctor *feels*, when involved in the diagnostic process. The emotional realm can adversely affect a clinician's diagnostic performance due to both temporary (stress, fatigue, anger, etc.) and long-term (mood disorders, etc.) problems.⁷ However, positive emotional states may benefit patients, particularly empathy—"a process for understanding an individual's subjective experiences by vicariously sharing that experience while maintaining an observant stance."⁹ Empathy allows for a therapeutic alliance and improves patient outcomes. Educational interventions can improve physician empathy. In this case, the physician's empathy drove the urgency of the clinical situation, and thus may be an underappreciated tool in the diagnostic process.

Another critical diagnostic tool is the physical examination, increasingly a "lost art." In a systematic review of diagnostic errors in primary care, nearly half of breakdowns in the clinical encounter were attributed to gaps in the physical examination.⁶ Incomplete examination has also been associated with cognitive errors such as premature closure. The patient's reluctance to remove his socks and gloves limited the initial exam. After a signature rash was revealed, the clinician was able to rapidly modify his differential diagnosis. This course correction may not have occurred had he not insisted on a thorough examination.

CLINICAL TEACHING POINTS

1. Syphilis is a sexually transmitted infection caused by the spirochete *Treponema pallidum*. Syphilis can involve nearly every organ system, including the eye, accounting for up to 5 % of cases of ocular inflammation in US tertiary care centers.¹⁰ Acquired ocular syphilis often presents as panuveitis; however, it can affect multiple structures within the eye, including the cornea, retina, and optic nerve. HIV co-infection is common among patients with ocular syphilis.
2. The rash of secondary syphilis classically consists of non-pruritic, symmetric, and generalized scaly lesions, with involvement of the palms and soles being an important manifestation. Patchy alopecia, giving a "moth-eaten" appearance to the hair, may also occur and involve the scalp (as in this patient) and eyebrows. With HIV co-infection, syphilis may present with atypical cutaneous manifestations including nodular, pustular, annular, and lues maligna.¹¹
3. Poor engagement in care is a major issue for HIV-infected patients, in addition to failure to initiate therapy, poor adherence, and resistance to antiviral medications.¹² Additional barriers include incarceration, poverty, homelessness, substance abuse, and mental health disorders that require specialized interventions.

Cognitive behavioral therapy for depression and psychosocial stress, in combination with adherence counseling, may improve antiretroviral adherence.¹³

Acknowledgments: We thank Dr. Mark C. Henderson for the many suggestions to enhance the clarity and content of this manuscript. Dr. Blackburn is affiliated now with the Internal Medicine residency program at Lake Cumberland Regional Hospital, Somerset, KY.

Corresponding Author: Carlos A. Estrada, M.D., M.S.; The University of Alabama at Birmingham, 720 Faculty Office Tower, 510 20th Street South, Birmingham, AL 35294-3407, USA (e-mail: cestrada@uabmc.edu).

Compliance with Ethical Standards:

Funding: None.

Prior Presentations: The case was presented at a noon conference clinical problem-solving unknown discussion at the Tinsley Harrison Internal Medicine Residency Program, University of Alabama at Birmingham, Birmingham, Alabama. The clinical information and case discussion closely reflect the topics discussed.

Conflicts of Interest: The authors declare that they do not have a conflict of interest.

Disclosures: The opinions expressed in this article are solely those of the authors and do not reflect the views of the Department of Veterans Affairs.

REFERENCES

1. **Croskerry P.** A universal model of diagnostic reasoning. *Acad Med.* 2009;84(8):1022-8.
2. **Campbell JA, Walker RJ, Egede LE.** Associations between adverse childhood experiences, high-risk behaviors, and morbidity in adulthood. *Am J Prev Med.* 2016;50(3):344-52.
3. **Balogh EP, Miller BT, Ball JR, eds.** Improving diagnosis in health care. Washington (DC): National Academies Press (US); 2015.
4. **Schiff GD, Hasan O, Kim S, et al.** Diagnostic error in medicine: analysis of 583 physician-reported errors. *Arch Intern Med.* 2009;169(20):1881-7.
5. **Ogdie AR, Reilly JB, Pang WG, et al.** Seen through their eyes: residents' reflections on the cognitive and contextual components of diagnostic errors in medicine. *Acad Med.* 2012;87(10):1361-7.
6. **Singh H, Giardina TD, Meyer AN, Forjuoh SN, Reis MD, Thomas EJ.** Types and origins of diagnostic errors in primary care settings. *JAMA Intern Med.* 2013;173(6):418-25.
7. **Croskerry P, Abbass A, Wu AW.** Emotional influences in patient safety. *J Patient Saf.* 2010;6(4):199-205.
8. **Croskerry P, Abbass AA, Wu AW.** How doctors feel: affective issues in patients' safety. *Lancet.* 2008;372(9645):1205-6.
9. **Zinn W.** The empathic physician. *Arch Intern Med.* 1993;153(3):306-12.
10. **Moradi A, Salek S, Daniel E, et al.** Clinical features and incidence rates of ocular complications in patients with ocular syphilis. *Am J Ophthalmol.* 2015;159(2):334-343.e331.
11. **Balogula Y, Mattei PL, Wisco OJ, Erdag G, Chien AL.** The great imitator revisited: the spectrum of atypical cutaneous manifestations of secondary syphilis. *Int J Dermatol.* 2014;53(12):1434-41.
12. **Gardner EM, McLees MP, Steiner JF, Del Rio C, Burman WJ.** The spectrum of engagement in HIV care and its relevance to test-and-treat strategies for prevention of HIV infection. *Clin Infect Dis.* 2011;52(6):793-800.
13. **Thompson MA, Mugavero MJ, Amico KR, et al.** Guidelines for improving entry into and retention in care and antiretroviral adherence for persons with HIV: evidence-based recommendations from an International Association of Physicians in AIDS Care panel. *Ann Intern Med.* 2012;156(11):817-33. **w-284, w-285, w-286, w-287, w-288, w-289, w-290, w-291, w-292, w-293, w-294.**