Turning Your Clinical Cases Into Scholarly Work

Vineet Arora MD FACP
Outline

• Why Case Reports?

• What makes a “good case”

• Art and science of diagnosis

• How to write an abstract
Why Write Up a Case Report?

- Identify & describe
  - new diseases
  - rare diseases or presentations of disease
  - mechanisms of disease
  - Side effects of treatment
    - adverse or beneficial
- Medical education
  - Teach presentation skills

Mural painting depicting Hippocrates & Galen, considered pioneers of the modern case history

Galen and Hippokrates from Anagni Italy Photo: Nina Aldin Thune
History of Case Reports

Always note and record the unusual…
Publish it.
Place it on permanent record as a short, concise note.
Such communications are always of value.

— Sir William Osler

Osler Library, McGill University, Montreal
Critics of Case Reports

• Highlighting the extremely unusual can do more harm than good
  – by emphasizing the bizarre
• Not evidence-based
• 2\textsuperscript{nd} class literature
• “n of 1” experience

Hoffman JR WJM 1999
Case reports permit discovery of new diseases and unexpected effects (adverse or beneficial) … they play an important role in medical education.

-Jan P. Vandenbroucke, MD, PhD

Ann Int Med 2001
New Diseases

- First cases of AIDS emerged as case reports of opportunistic infections in MSM
  - Kaposi’s
  - PCP
  - Thrush
Describing Emerging Threats

Research

Bioterrorism-Related Inhalational Anthrax: The First 10 Cases Reported in the United States

John A. Jernigan,* David S. Stephens,** David A. Ashford,* Carles Omenaca,†
Martin S. Topol,§ Mark Cafaro,¶ Michael Tapper,¶ Tamara L. Fick,¶ Sherif
Zaki,* Tanja Popovic,* Richard F. Quinn,* Scott A. Harper,*
Scott K. Fridkin,* James J. Sejvar,° Colis W. Shepard,* Michelle McCunnell,*
Jeanette Guarnier,* Yun-Ju Shieh,* Jean M. Malecki,** Julie L. Cerberdang,*
James M. Hughes,* Bradley A. Perkis,* and members of the Anthrax
Bioterrorism Investigation Team

*Centers for Disease Control and Prevention, Atlanta, Georgia, USA; ¶Emory University School of
Medicine, Atlanta, Georgia, USA; ¶
Edward Medical Center, Miami, Florida, USA; ¶Virtus Health,
Mount Holly, New Jersey, USA; ¶Winchester Medical Center, Winchester, Virginia, USA; ¶Lenox Hill
Hospital, New York City, New York, USA; and ¶Palm Beach County Department of Public Health,
West Palm Beach, Florida, USA

From October 4 to November 2, 2001, the first 10 confirmed cases of inhalational anthrax caused by intentional release of Bacillus anthracis were identified in the United States. Epidemiologic investigation indicated that the outbreak, in the District of Columbia, Florida, New Jersey, and New York, resulted from intentional delivery of B. anthracis spores through mailed letters or packages. We describe the clinical presentation and course of these cases of bioterrorism-related inhalational anthrax. The median age of patients was 55 years (range 43 to 73 years), 70% were male, and 60% for one, all were known or believed to have processed, handled, or received letters containing B. anthracis spores. The median incubation period from the time of exposure to onset of symptoms, when known (n=9), was 4 days (range 4 to 6 days). Symptoms at initial presentation included fever or chills (n=10), sweats (n=7), fatigue or malaise (n=10), minimal or nonproductive cough (n=6), dyspnea (n=3), and nausea or vomiting (n=2). The median white blood cell count was 6.6 X 10^3 /mm^3 (range 7.5 to 13.5), often with increased neutrophils and band forms. Nine patients had elevated serum transaminase levels, and six were hypoxic. All 10 patients had abnormal chest X-rays; abnormalities included infiltrates (n=5), pleural effusion (n=6), and mediastinal widening (seven patients). Computed tomography of the chest was performed on eight patients, and mediastinal lymphadenopathy was present in seven. With multidrug antibiotic regimens and supportive care, survival of patients (60%) was markedly higher (>15%) than previously reported.

Historically, human anthrax in its various forms has been a disease of those with close contact to animals or animal products contaminated with Bacillus anthracis spores. In the mid 1800s, inhalational anthrax related to the textile industry became known as woolworkers’ disease (in England) (1) and rugmakers’ disease (in Germany and Austria) because of the frequency of infection in mill workers exposed to imported animal fibers contaminated with B. anthracis spores. In the early 1900s, human cases of inhalational anthrax occurred in the United States in conjunction with the textile and tanning industries. In the last part of the 20th century, with improved industrial hygiene practices and restrictions on imported animal products, the number of cases fell dramatically (1.2); however, death rates remained high (≥95%) (1.3). In 1979, in Sverdlovsk, former Soviet Union, an apparent aerosol release of B. anthracis spores
Recognizing New Side Effects

THE LANCET

Scleromyxoedema-like cutaneous diseases in renal-dialysis patients

Shawn E Cowper MD a, Howard S Robin MD b, Steven M Steinberg MD b, Lyndon D Su MD c, Samandeep Gupta MD c, Philip E LeBoit MD a

Summary

15 renal dialysis patients have been identified with a skin condition characterised by thickening and hardening of the skin of the extremities and an increase in dermal fibroblast-like cells associated with collagen remodelling and mucin deposition. The disease closely resembles scleromyxoedema, yet has significant enough clinical and histopathological differences to warrant its designation as a new clinicopathological entity.
Interesting Case

Gadolinium – a specific trigger for the development of nephrogenic fibrosing dermopathy and nephrogenic systemic fibrosis?

Thomas Grobner

Department of Nephrology, General Hospital of Wiener Neustadt, A-2700 Wiener Neustadt, Austria

Correspondence and offprint requests to: Dr Thomas Grobner, 2. Intern Abteilung, Krankenhaus Wiener Neustadt, Corvinusring 3–5, A-2700 Wiener Neustadt, Austria. Email: dr.thomas.grobner@aon.at

Keywords: end stage renal disease; gadolinium–DTPA; metabolic acidosis; nephrogenic fibrosing dermopathy
Case reports of side effects led to the creation of Viagra

"None of us at Pfizer thought much of the side effect at the time. I remember thinking that, even if it did work, who would want to take a drug on a Wednesday to get an erection on a Saturday?"

How I discovered Viagra

Cosmos, June 2007
by Ian Osterloh
Selecting a Case
What makes a great case?

“Every patient you see is a lesson in much more than the malady from which he suffers.”

-William Osler
Great Cases

- Uncommon presentation of common disease
  - Diabetic muscle infarction
- Common presentation of uncommon disease
  - Yellow nail syndrome
- A recent diagnostic or therapeutic advance
  - TTP – use of ADAMTS-13
- Clinical pearl for physical exam or history
  - Muerkhe’s nails
Figure 2 - Image showing lymphedema and ungual alterations

Yellow Nail Syndrome
Normal Subject

- Cleaved unusually large multimers of von Willebrand factor

Patient with Thrombotic Thrombocytopenic Purpura

- Adhesion and aggregation of platelets
- uncleaved unusually large multimers of von Willebrand factor

You may have an interesting case…

But does it have a diagnosis?

Must use cases that culminate with at least a presumed diagnosis or illustrate clinical pearl
Art & Science of Diagnosis for Interesting Cases

- Not leaving stones unturned
  - Fight the urge for early closure

- Asking the right questions

- Looking for unifying associations or explanations
Patterns of Diagnosis

NOVICE
• exhaustive method
  – every possible question is asked and all possible data is collected

• algorithmic method
  – provider follows the steps of a proven strategy

EXPERT
• differential diagnosis
  – provider uses a systematic, problem-focused method of inquiry

• pattern-recognition method
  – provider uses experience to recognise a pattern of clinical characteristics
  – “power of observation”
The Real Sherlock Holmes

• Dr. Doyle’s physician mentor
  – Making diagnoses depend on close observation

• To keep students interested in learning how to observe
  – Would use observation to demonstrate occupation and recent activities

• Pioneer in forensic science to investigate crimes

Dr. Joseph Bell
Knowing When to Diagnose: Avoiding Zebra Chasing

- Overlook common diagnoses
- Leads to inappropriate care

- Diagnostic testing
  - Costly
  - Overused
  - Risky
    - Radiation for imaging
    - Work up of incidentalomas
Case

• A 40 yo female with the diagnosis of severe asthma presents to ED for shortness of breath and wheezing. She has been in and out of hospitals for the past 3 months and has not been able to go off steroids without getting worse. However, she ran out of her asthma medicines including steroids last week. She is not a smoker. She has a peripheral eosinophilia of 10%. CXR is normal.

• Most common?
• Things to rule out?
## Avoiding Misdiagnosis

<table>
<thead>
<tr>
<th>Bias</th>
<th>What</th>
<th>Who</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anchoring</td>
<td>Rely on initial impression despite contrary information</td>
<td>Anyone esp during handoffs</td>
<td>ER resident says “asthma” patient so you treat it as asthma</td>
</tr>
<tr>
<td>Availability</td>
<td>Go with what it was the last time you heard</td>
<td>Anyone esp those with little experience</td>
<td>Last patient you heard about like this patient had ABPA</td>
</tr>
<tr>
<td>Representative</td>
<td>Fixate on one thing despite many other data points</td>
<td>Anyone esp those with little experience</td>
<td>Hear eosinophilia and it MUST be Churg-Strauss</td>
</tr>
<tr>
<td>Blind obedience</td>
<td>Overreliance on consultant opinion or a test</td>
<td>Anyone!</td>
<td>She’s seen by pulmonary so must be asthma</td>
</tr>
</tbody>
</table>
Tools to Make the Diagnosis

- OCCAM’S RAZOR
- HICKAM’S DICTUM
- SUTTON’S LAW
- PASTEUR’S DICTUM
Occam’s Razor

“entities must not be multiplied beyond necessity”

- **shaving** away unnecessary assumptions to get to simplest explanation
- Diagnostic parsimony
Counterfactual to Occam’s razor

Hickam's dictum

"Patients can have as many diseases as they damn well please"

John Hickam, MD
“What on earth is Saint’s Triad?”

- Dr. C.F.M. Saint

Gallstones

Constellation of symptoms is often explained by several common diseases rather than one single rare disease

Diverticula

Hiatal Hernia

Hilliard AA NEJM 2004
Sutton’s Law

• First, consider the obvious
  – Conduct the test which will confirm (or rule out) the most likely diagnosis

• Bank robber Willie Sutton, when asked why he robbed banks supposedly answered
  – “because that's where the money is“
"chance favors the prepared mind"

- Pasteur's dictum

- Must have the existing knowledge & skills to be able to make the ‘leap’

- Cannot find an interesting case if you are not reading or looking
Steps to Writing Up A Case

- Selecting a Case
- Literature Search
- Collecting Information (Review Chart)
- Check Formatting (abstract etc.)
- Start Writing
- Get Input Revise
- Get More Input and Revise Again
- Submit!
Consulting the Literature

- Is this common?
- How often is it reported?

- Pubmed
  - MeSH headings
- Google
  - To help locate source literature

• Beware of ‘grey literature’
Reviewing the Chart
Chart Artifacts from Epic

• Secure the Admission History & Physical
• Relevant Progress Notes
• EKG (especially if abnormal)
• Labs
  – Routine Labs (CBC/ BMP/ LFTs/ Coags)
  – Other heme labs (i.e. anemia workup)
  – Endocrine or Nutrition Labs
  – Relevant rheumatology labs
  – Microbiology
  – ABG
  – Other Labs
Chart Artifacts from Epic

- Imaging – report and actual images
  - CXR
  - Other plain films
  - CT
  - MRI
  - Other

- May need to review with radiologist to select proper image to display

- REMOVE MRN AND ALL PHI PRIOR TO USE!
Other Images from Consultants

- Hematology
  - Smears
- Pathology
  - Biopsy? Surg path?
- GI
  - Colonoscopy, etc.
- Microbiology
  - Cultures
- Cardiology
  - Echocardiogram
  - Angiogram
- Vascular Lab

Harder to get
  - Only if critical in diagnosis
Patient Pictures

- Consent for photos
- High resolution
- Key physical exam finding
- Rash or clinical pearl
Writing the Abstract
3 Principles

1. Make sure the case is interesting
2. Include only pertinent information
3. Be concise

Irrelevant material or excessive detail can obscure the essence of a report and repel editors and readers.

Debakey & Debakey 1983
Abstract

• Check format
  – Check word count (450 words for IL ACP)
  – Subheadings

• Use every word wisely
  – Is there a shorter way to say the same thing

• Reserve enough space for discussion
Typical Headings

- Objective – short 1-2 lines
- Case Description – less than half
- Discussion – more than half
Objective

• Begins with ‘To’
• Use action verbs
  – Characterize
  – Elucidate
  – Highlight
  – Demonstrate
  – Familiarize
• In enough detail to highlight what the case is about
• If the format calls for objectives, okay to give away the diagnosis here…
Case Description

• Follow rules of basic medical presentation
  – Start with history, physical exam
  – Only include pertinent positives and negatives that relate to diagnosis

• Results of relevant studies
  – Ways that diagnosis was confirmed

• End with the diagnosis
  – Include any patient follow-up
Case Discussion

• Start with what the condition is
  – How frequent is it?
• Consider a historical pearl or fact
  – When was this disease recognized
• Hallmarks of the condition
• Prognosis & Treatment of condition
• Relate it back to your patient
What is the take home point for clinicians? (end with this pearl)

- Modify for meeting you are submitting to (hospitalists, generalists, subspecialists)

- Best abstracts make a small number of teaching points (even just one) in clear and succinct language
Abstract Pitfalls

• Over wordcount
  – Trim words
  – Say it in less words
  – Remove unnecessary details from case
  – Focus discussion

• Not enough room for discussion
  – Case description too detailed
  – OK to say “rheum workup negative”
More Pitfalls: Referring to Patients

• Confusing patients for body parts of procedures
  – Cyclosporin is used to treat organ transplant (used to treat patients with organ transplants)

• Treating patients like commodities
  – We managed the patient with antibiotics (We treated..)

• Blaming the patient
  – The patient failed to follow-up (Patient was lost to ..)
More Pitfalls

• Abbreviations
  – No more than 3
  – Favor commonly used abbreviations
  – Spell out first time mentioned unless very common (e.g., CBC)
Titles

• short, descriptive, and interesting
  – Peak interest

• Do not give away the diagnosis
  – But could use obscure eponym

• adianoeta
  – Double entendre
  – Pun with double meaning

• Think of last
  – may need to dwell on it a bit..
Sample Titles

• “Nail”ing the Diagnosis

• TTP or Not TTP?

• Tissue is the Issue: An unusual cause of hepatosplenomegaly and pancytopenia

• Collateral Damage
Questions
Department of Diagnostic Medicine
Diagnosis & Detectives

• Sir Arthur Conan Doyle & Holmesian deduction
  – Draw inferences based on straightforward practical principles
  – Based on careful observation and attribution to the best explanation

“When you have eliminated the impossible, whatever remains, however improbable, must be the truth”