CASE REPORT

An intertidal mollusk found in a boy's skin abscess

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Accepted 25 January 2018

SUMMARY

Skin abscesses are commonly seen by primary care physicians in the outpatient setting. The majority of these soft tissue infections arise from penetration wounds by inanimate objects, but rarely, a living organism may present as a contributing factor. We present a case of an 11-year-old boy with an unusual skin abscess containing a chequered periwinkle marine snail (*Littorina scutulata*). The unique characteristics of this intertidal mollusk appear to have enabled it to survive in the subcutaneous tissue for a week, despite the hostile environment of a skin abscess. This case emphasises adherence to current professional guidelines that recommend incision and drainage of suspected skin abscesses and encourages clinicians to take a careful history of present illness which may aid in identification of subsequent cases of marine snails, or other living organisms, residing in skin abscesses.

BACKGROUND

Skin and soft tissue infections (SSTIs) are commonly seen by primary care physicians in the ambulatory office setting. Approximately 60% of these SSTIs evaluated in the outpatient setting are classified as abscesses or cellulitis.¹ A skin abscess is a collection of pus within the dermis or subcutaneous space commonly presenting as a tender, erythematous, firm or fluctuated mass on physical examination.² The majority of SSTIs are caused by *Staphylococcus* or *Streptococcus* spp and are more likely to occur when the normal skin barrier has been disrupted due to trauma such as abrasions, penetrations, bite wounds and ulcerations.³ Disruption of epidermal integrity may also open the door to infection secondary to foreign bodies. Rarely, opportunistic organisms, parasites and other uncommon pathogens may develop subcutaneously leading to a most unusual skin abscess. We report the case of an 11-year-old boy with a skin abscess containing a seasnail 1 week after falling on a rock in a southern California tide pool. A thorough background review confirmed the peculiarity of this case as there were no other similar case reports found in the medical literature.

CASE PRESENTATION

An 11-year-old Hispanic boy presented to an outpatient clinic with a chief complaint of a 'blister' located on his left elbow. He initially noticed this lesion about 1 week prior and stated that it has been slowly getting larger. He admitted to a recent history of minor trauma to his left elbow when he slipped on a rock while exploring tide pools in San Pedro, California, USA. His parents cleansed the wound after the incident and subsequently brought

him to the clinic 8 days after the initial trauma when they suspected that his elbow might be infected. He endorsed erythema, mild elbow tenderness and swelling of his left elbow. He denied any purulent discharge, pruritus, fever, arthralgia or restrictions in range of motion. He was otherwise healthy and was up to date on all of his immunisations. On physical examination of the bilateral upper extremities, there was an apparent abscess with palpable nodule measuring approximately 1 cm × 1 cm on the dorsal-medial surface of the left elbow. The site was located about 15 mm from the edge of the elbow and exhibited mild tenderness to palpation, erythema and localised oedema. The abscess was without punctum and crepitus, but appeared to be developing into a possible early cellulitis evidenced by the erythema. The patient's temperature was 36.4°C, heart rate was 88 beats/min, blood pressure 115/71 mm Hg, respiratory rate 21 breaths/min, height 145.4 cm and weight 51.1 kg. He was in no apparent distress and was willing to undergo an incision and drainage. Using sterile technique, a 24-gauge needle was introduced into the abscess and a small amount of pus was expressed. On further incision and drainage, a small, darkly coloured foreign body was appreciated. A seasnail and its shell, measuring 4 mm in diameter, were removed from the site. Photos of the specimen were taken (figure 1), archived and later identified as a chequered periwinkle (*Littorina scutulata*). A dry dressing was then applied to the wound and the patient was prescribed antibiotics with instruction to follow-up if no improvement. The patient was visibly excited about the surprising discovery and requested to keep the specimen so he could share the story with family and friends.

TREATMENT

Incision and drainage procedure using a 24-gauge needle.

Clindamycin 300 mg po three times a day for 10 days.

OUTCOME AND FOLLOW-UP

On follow-up phone conversation 1 week later, the wound had fully healed and the patient had made a full recovery. The family reported movement of the seasnail 1 day following removal, but no further movement thereafter.

DISCUSSION

An extensive literature review of major medical and scientific databases including PubMed, AccessMedicine, Embase, VetMed Resource and ScienceDirect was performed. After careful examination, we found

To cite: Line SW, Khait A. *BMJ Case Rep* Published Online First: [please include Day Month Year]. doi:10.1136/bcr-2017-222626

Figure 1 Specimen removed from the abscess in the patient's left elbow, later identified as a chequered periwinkle seasnail (*Littorina scutulata*). Views: (A) dorsal, (B) ventral.

no documented case reports in medical literature of *L. scutulata* or other marine snails living inside a bacterial skin abscess for any length of time. However, there was a well-documented report in the media of a 4-year-old boy who fell and scraped his knee on a rock while camping on a beach in Orange County, California, USA. This child presented with nearly identical symptoms of a bacterial skin abscess with an underlying firm nodule.⁴ After 3 weeks of watchful waiting and antibiotics, his mother squeezed the wound and expressed pus, along with the same species of periwinkle.⁴

The chequered periwinkle (*L. scutulata*) inhabits rocky shorelines and tide pools all along the western coast of the USA and into parts of Canada and Mexico.⁵ This well-studied family of intertidal mollusks are small in size (up to 15 mm) and have been known to live as long as 7 years.^{6,7} Periwinkles are herbivores, feeding primarily on algae from rocks in the high tidal zones. As a result of living in this habitat, they are often exposed to air and have the capability to close their shell tightly onto firm surfaces with a horny operculum and a glue-like mucus.^{6,7} This allows them to preserve water and moisture inside their shell, therefore avoiding desiccation and suffocation.⁷ These characteristics make the chequered periwinkle a unique visitor into the human body and appear to have allowed this organism to survive despite the extreme environment of the host.

While inanimate foreign bodies (wooden splinters, glass shards and so on) in the dermis or subcutaneous space may present somewhat frequently, the uniqueness of this case lies within the common periwinkle's remarkable ability to inoculate human subcutaneous tissue and then survive the hostile environment of a skin abscess. It appears that in both cases where chequered periwinkles were found within skin abscesses, the young boys were likely inoculated from a rock containing sea water near intertidal zones. Chequered periwinkle breeding typically occurs from spring to fall where thousands of eggs are released by the female seasnails into the water where they may attach to rocks.⁷ Previous research has indicated that the common periwinkle (*Littorina littora*) can grow up to 14 mm in the first year with ample resources and that female seasnails typically display a more rapid growth rate.⁸ Combining this information with the patient's presenting history, we propose that the chequered periwinkle discovered in this case was inoculated as a smaller organism and then developed into the 4 mm × 4 mm specimen appreciated in the examination room. The chequered periwinkle was then able to survive the harsh environment of the bacterial skin abscess due to its specialised ability to avoid desiccation by sealing moisture within its shell. While skin

abscesses related to living foreign bodies are certainly unexpected, they will likely be identified by clinicians following current protocols for SSTIs and skin abscess.

There are several guidelines published by professional organisations such as the Infectious Diseases Society of America and the American Academy of Family Physicians on best practices for clinicians faced with skin abscesses of varying severity. When facing a purulent SSTI or skin abscess, the critical step in each of these guidelines is to perform an incision and drainage.^{3,9} Any inanimate or living foreign body is likely to be appreciated on completion of the incision and drainage. A specimen culture and gram stain analysis of pus from abscesses are recommended, but clinicians are able to proceed with empiric antibiotic treatment covering methicillin-resistant *Staphylococcus aureus* without these studies. Antibiotics are commonly used in the treatment of patients with suspected early cellulitis, increased risk factors or with signs of systemic disease.¹ A neglected foreign body with penetration into the subcutaneous space can result in even more severe infections such as cellulitis or osteomyelitis.¹⁰ When available, the use of ultrasonography should be thoughtfully considered in the evaluation SSTIs as it provides a more accurate diagnosis along with depiction of depth, presence of fluid and cavity size.¹¹ With prompt diagnosis and treatment of SSTIs, and specifically skin abscesses secondary to foreign objects, favourable results can be achieved.

Learning points

- ▶ The most essential step in caring for patients with bacterial skin abscesses is performing an incision and drainage. Antibiotics and close follow-up may also be necessary.
- ▶ Clinicians should maintain a high index of suspicion for possible foreign body inoculation of intertidal seasnails when the patient's history includes recent trauma near tide pools.

Acknowledgements The authors give a warm thanks to Lindsey T Groves, Collection Manager, Malacology Department, Natural History Museum of Los Angeles County, for his assistance in initial identification of the specimen.

Contributors AK: conceptualised the case report after examining the patient detailed in the manuscript; performed the initial literature review, edited and revised each draft of the manuscript, and provided mentorship for SWL (medical student) on procedures of journal submission. SWL: performed a secondary literature review, compiled background information, drafted the initial manuscript and edited subsequent drafts for journal submission. Both authors: approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

Competing interests None declared.

Patient consent Guardian consent obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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