

Picture This...

Walter Greenhalgh MD; Daniel Schissel, MD

A 38 year old male Airman presents complaining of multiple itchy and occasionally very painful (searing, tearing sensation) furuncular lesions on his scalp, both arms, and his left lower leg that are enlarging in size over six to eight weeks. Close inspection reveals a central puncta on each lesion which, when probed, is actually a fairly deep pore. There is no appreciable lymphadenopathy, and vital signs are normal. During the previous two weeks, the nodules have started to drain a serosanguinous discharge from a central punctum, to the point where his bed sheets and pillow cases have to be changed nightly. Recent travel history includes a vacation to Costa Rica 10 weeks earlier, but no recent deployments.

Each puncta is probed with fine needle-nosed forceps, the tissue within is grasped and the mass shown is delivered with light to moderate traction.



Photo 1



Photo 2



Photo 3



Photo 4

Photo 5



Question 1:

Using the primary lesion definitions outlined in your SOF medical handbook, how would you describe the morphology of these lesions prior to delivering their contents?

Question 2:

What is your differential diagnosis for these nodular draining lesions prior to probing? How about after you deliver the contents?

ANSWERS

Question 1:

Morphology: these lesions are non-fluctuant nodules that vary in size from 6mm to over 22mm in diameter. They are surrounded by mild to moderate erythema, and have a central puncta draining serosanguinous fluid.

Question 2:

Prior to making the obvious diagnosis based on the lesions' content, your differential diagnosis should include carbuncles and furuncles, sebaceous cysts, skin malignancies, local insect bite reactions, and myiasis. Clues to help differentiate this from a malignancy would be the number of lesions that developed, and their acute development. Sebaceous cysts also usually take much longer to develop. The local intense inflammation and pain also steers us away from typical malignancies. Carbuncles and furuncles can look very similar to these lesions, and usually present in multiple polymorphic stages, but you might expect more local tenderness and fluctuance to palpation, as well as lymphadenopathy. The serosanguinous drainage, when cultured, will often be sterile in the case of myiasis, whereas in carbuncles and furuncles the discharge is purulent and usually grows a staph species. Local reactions to insect bites should generally subside after several days to a week.

MYIASIS

EPIDEMIOLOGY

Myiasis, first described by Hope in 1840,¹ is the term used to describe the invasion of tissues and organs of humans and other animals by the larvae of flies of the order Diptera. Diptera are two-winged flies whose first stage larvae require a warm-blooded animal as host for maturation.²

Dermatobia hominis, otherwise known as the human botfly, belongs to the family Cuterebridae. The botfly is endemic from central Mexico down through Central and South America, and can grow to 18mm in length. They populate areas of forests and jungle, usually near rivers and streams or along coastal areas.³ After it mates, the female catches a biting arthropod, such as a mosquito or tick, to act as a mechanical vector. It will hold the arthropod with its hind legs while it deposits 15 to 30 eggs on its abdomen. Multiple depositions may occur during the nine day life cycle of the female botfly, as up to 400 eggs are produced per female botfly. If an insect vector cannot be found, the female botfly may deposit its eggs on plant leaves instead.

CLINICAL COURSE

In addition to humans, wild and domestic animals as well as birds can act as host to the fly's development. Domestic cattle are a common target, which can have significant local economic impact.⁴ Once the host comes into contact with these plant leaves or has an egg carrying vector land on it, the eggs are deposited on the host animal. The eggs increase in temperature due to contact with the warm blooded host, causing the eggs to hatch and resulting in a first stage larva. The larva then enters the skin, anterior end first. It may enter through a hair follicle, a pore, or through a breach in the skin created by the aforementioned biting arthropod. This entire process usually takes less than 60 minutes, and sometimes in as little as 5 minutes. Initial penetration is usually not felt by the host. Within a day a small papule develops, gradually enlarging up to 15 to 20mm in diameter.⁵

The larva stays in the subcutaneous skin from four to 14 weeks. During this time it may grow to over 20mm in size, developing into an instar, or third-stage larva. At this point, the larva emerges from the skin, falls to the ground, pupates for 14 to 30 days in the soil, and emerges as a mature botfly, living for an additional two weeks. This entire life cycle lasts approximately three to four months.^{5,6}

The botfly larva itself has two curved oral hooks. These help it to grasp and tear tissue for the purposes of feeding, and are responsible for the searing and tearing feeling patients often describe with this infestation. The larva also has several rows of parallel concentric rows of posterior pointing spines that help it to remain anchored within the subcutaneous tissue. The larva breathes through a spiracular plate in its posterior end, resulting in the oft cited description of bubbles appearing through the puncta or of movement of the column of fluid just inside the puncta. The fluid itself may be serosanguinous or even purulent an appearance, however it is not common for secondary bacterial infection in these lesions, thus antibiotics are not usually required once the lesions are evacuated.⁷

TREATMENT

There are numerous treatments described for furuncular myiasis. The most common involves suffocating the larvae while in the skin. This is done by occluding the puncta and spiracular plate through which the larvae breathe. This results in death of the larva within the skin making removal easier, and if not then usually the larva migrates out of the skin as it attempts to breathe, again making complete removal more easy.³ Many substances have been used to occlude the puncta, including wax, gum, nail polish, tape, raw meat, and petroleum jelly. A benefit to the use of raw meat or bacon is that it may attract the larva out of the skin completely as it looks for a tastier meal.

Injection of lidocaine directly into or under the larvae is also described as a treatment.² Often the pressure of this fluid in the space below the larva is enough to partially force it out of the pore. This also facilitates any surgical excision required in the removal of the larvae. Dissection or debridement should be minimized, however, as these lesions, once evacuated of their passengers, usually heal very well and have minimal, if any, scarring. Antibiotics should only be given in cases where bacterial infection is clearly demonstrated. Factors complicating myiasis treatment include incomplete organism removal, in which case a persistent foreign body reaction may occur or a granuloma may appear. Only rarely has myiasis resulted in death and has usually been in cases where the larva has inadvertently migrated into a body cavity, such as the skull via the soft fontanel of a young child, resulting in meningitis. Tetanus has also been described as a rare complication.⁸ Systemic symptoms are rare in myiasis,⁷ with the typical presentation being just as with this patient. Aside from an acute case of the heeby geebies, the patients usually suffer no after effects.

REFERENCES

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Commander Walt Greenhalgh graduated from Jefferson Medical College, Thomas Jefferson University, Philadelphia Pennsylvania, in 1992. After completing an internship in General Surgery at the National Naval Medical Center in Bethesda Maryland, he attended the Naval Aerospace Medical Institute in Pensacola Florida as a Student Naval Flight Surgeon. After a 3 year tour as a Flight Surgeon at the Marine Corps Base, Quantico, Virginia, he completed a residency in Family Medicine at the Puget Sound Family Medicine Residency Program at the Bremerton Naval Hospital in 1998. His next tour of duty was in as Family Physician and Senior Medical Officer at the Branch Medical Clinic, Gaeta, Italy. In 2001 he returned to Marine Corps Base Quantico, where he was the Director for Primary Care and the Chief of the Professional Staff. In 2003 he transferred to the Pentagon, Washington, DC, where he worked as Family Physician and Flight Surgeon for the US Air Force's 11th Medical Group Aviation Medicine Clinic. His current duty station, since 2006, is at the U.S. Naval Hospital, Rota, Spain, where he serves as the Senior Medical Executive/Chief of Professional Staff as well as Staff Family Physician and Flight Surgeon.



COL Daniel Schissel originated "Picture This" for the Med Quiz. He is a 1993 graduate of the Uniformed Service University of the Health Sciences and completed his internship with the family practice department at Fort Bragg in 1994. He then served as the 2/10th Special Forces Group (Airborne) Surgeon and followed on as the 10th SFG(A) Group Surgeon. He completed his residency training in dermatology at the Brooke Army Medical Center in 1999. LTC (P) Schissel is presently stationed in Heidelberg, Germany as a staff physician and the European Regional Medical Command Dermatology Consultant. He has been selected as the U.S. Army OTSG Dermatology Consultant. LTC (P) Schissel has authored the dermatology section of the new SOF manual, serves on the USSOCOM Medical Curriculum and Examinations Board, and is the U.S. Army Aviation Dermatology Consultant.