CLINICAL IMAGES

Paronychia

Korinn Vandervall, OMS III,[1] Mary Ann Yehl, DO,[2] & Lindsay Tjiattas-Saleski, DO, MBA, FACOEP[3]

[1] VCOM Carolinas, Spartanburg, SC
[2] Family Medicine Red Bank, NJ
[3] Greenville Health System Emergency Department, Greenville, SC

A 73-year-old female with past a medical history of diabetes mellitus type II, hypertension and thyroid disease presented to the Urgent Care Center with right distal thumb pain and swelling (Figure 1). She had been seen two days prior, diagnosed with paronychia and prescribed cephalexin 500mg three times daily. She reported no improvement in the antibiotics and warm soaks. She did not report any associated fevers or chills. On her second visit, incision and drainage were performed. She discontinued cephalexin, and trimethoprim/sulfamethoxazole was started.

QUESTIONS

1. Acute paronychia treatment choices include:
   a. Warm water soaks 3-4 times daily
   b. Incision and drainage for abscesses
   c. Antibiotics for abscess or high-risk patients
   d. Only a and b
   e. All of the above

2. What are the risk factors for Acute Paronychia?
   a. Nail biting
   b. Diabetes Mellitus
   c. Artificial Nails
   d. HIV
   e. All of the Above

3. What are the recommended treatments for chronic paronychia?
   a. Discontinue inciting activity
   b. Antifungals Topical Steroids
   c. Amputation
   d. A and B
   e. A and C

4. The best antibiotic choices for acute paronychia induced from nail biting are:
   a. Vancomycin
   b. Clindamycin
   c. Clarithromycin
   d. Levofloxacin
   e. Azithromycin

5. Your resident explains he saw an acute paronychia and wishes to perform an incision and drainage. You note the patient has nail fold pain with a cluster of yellow lesions on an erythematous base. You stop him from performing because the diagnosis is:
   a. Chronic paronychia
   b. Herpetic whitlow
   c. Squamous cell carcinoma
   d. Felon
   e. Onychomycosis

FIGURE 1:
Thumb view

CORRESPONDENCE:
Lindsay Tjiattas-Saleski DO, MBA, FACOEP
LTjiattas-Saleski@ghs.org

ANSWERS

1. Acute paronychia treatment choices include:

   The correct answer is E) All of the above

   Patients with a mild paronychia infection without abscess may benefit from warm water soaks alone. Once an abscess develops, an incision and drainage are generally required to promote healing. Antibiotics are given to cover suspected organisms based on medical history.

2. What are the risk factors for Acute Paronychia?

   The correct answer is E) All of the Above

   Any condition that disrupts the integrity of the nail bed can predispose patients to acquiring acute paronychia. These risk factors include; nail biting, finger biting or sucking, manicures or artificial nail application. Medical conditions that compromise immunity such as diabetes, HIV, medications and chemotherapy can increase the risk of paronychia as well.

3. What are the recommended treatments for chronic paronychia?

   The correct answer is D) A and B

   Chronic paronychias are a result of repetitive trauma, inflammation, or exposure. This leads to an infection, most commonly, with candida. Treatment includes discontinuing the irritation or contact. Topical steroids to treat the dermatitis aid in the healing of nail folds, cuticle structure, and removal of habitat for candida. Antifungals are considered for resistant treatment, the antifungals can aid in reduced inflammation due to concomitant fungal infection if present.

4. The best antibiotic choices for acute paronychia induced from nail biting are:

   The correct answer is B) Clindamycin

   When choosing an antibiotic for paronychia, one must consider the patient's medical history, severity, and duration of infection. A patient who has had oral exposure from nail-biting or finger sucking needs coverage for anaerobic organisms. Vancomycin would be a good choice for an extensive infection that is suspected methicillin-resistant Staphylococcus aureus (MRSA) for a hospitalized patient. Clarithromycin, levofloxacin, and azithromycin would not provide coverage that is required.

5. Your resident explains he saw an acute paronychia and wishes to perform an incision and drainage. You note the patient has nail fold pain with a cluster of yellow lesions on an erythematous base. You stop him from performing because the diagnosis is:

   The correct answer is B) Herpetic whitlow

   All nail fold infections are not paronychias and its imperative to consider the differential diagnosis. Any vesicular lesion should be evaluated for herpes. Chronic paronychia appears as erythematous areas to nail folds. Squamous cell carcinoma presents typically as a tumor, ulceration, or fungating masses. A felon is a localized compartment syndrome at the palmar finger pad. Onychomycosis presents with irregular texture and color changes to the nail.

DISCUSSION

Paronychia is an infection of the nail fold, which can be an acute or chronic process.[1,2] This infection is associated with trauma or injury to the nail folds, which allows bacteria to invade.[1] Paronychia represents 35% of hand infections making it the most common hand infection in the United States.[3]

Acute paronychia is a painful pyogenic infection that presents with a rapid development of finger or toe pain, over the course of several hours to a few days.[1,2,4] Physical examination findings can vary from a red and tender swelling of the nail fold to obvious cellulitic changes or abscess formation.[4] Acute paronychia affects males and females equally, with a higher prevalence in children.[5] Risk factors include trauma to skin surrounding the nail, ingrown nails, manicured/sculptured nails, and thumb/finger sucking.[2] Repetitive biting of fingers and thumb sucking causes microtrauma allowing colonization of bacteria, most commonly Staphylococcus aureus but also Streptococcus pyogenes, Pseudomonas pyocyanea, and Proteus vulgaris.[2,5] If oral flora is part of the exposure the clinician should also consider aerobic Eikenella corrodens and anaerobic Fusobacterium and Peptostreptococcus.[2] The diagnosis of acute paronychia is clinical and should be considered when a patient presents with redness, pain, and warmth that developed acutely along the nail margin.[6]

Chronic paronychia is a progressive, inflammatory disorder lasting for more than six weeks and affects more than one nail fold.[1,8] It usually affects older individuals around the 5th and 6th decade, with a higher prevalence in females as compared to males.[5] Chronic paronychia affects patients that tend to have constant exposure to wet conditions including cooks, chefs, bartenders, housekeepers, and swimmers.[2,7] It is caused by many of the same mechanisms as acute paronychia but over an extended period.[1,7,8] The exposure to repetitive trauma and moist conditions leads to a multifactorial inflammation, usually dermatitis, that can become infected.[1,7,8] Chronic paronychia presents as a tender erythema and thickening of the nail folds, followed by loss of the cuticle.[1] These nail and tissue changes can lead to dystrophy of the nail plate.[1,2] Patients often have co-infection with Candida about 95% of the time, and less frequently may have co-infection with dermatophytes and molds such as Scytalidium Fusarium.[2] Unless preventative measures are initiated, the cycle of irritation and nail changes will continue.[1,7,8]

Paronychia can also be drug-induced, occurring with systemic retinoids (isotretinoin, etretinate), topical retinoids (tretinoin, tazarotene), antiretroviral drugs (indinavir), epidermal growth factor (EGF) receptor inhibitors (gefitinib and cetuximab), and anticancer mTOR inhibitors (everolimus).[1,9] Patients with drug-induced paronychia present with erythematous, swollen, and painful nail fold(s), shortly after beginning treatment with a new medication.[9] These lesions heal gradually after cessation of treatment and can be followed by onychomadesis, (proximal shedding of nail).[9]

DIFFERENTIAL DIAGNOSIS

Since paronychia is a clinical diagnosis, it is important to keep in mind other skin conditions that may present similarly including, but not limited to the following:

1. Felon: a localized compartment syndrome of the distal phalanx to the volar skin the finger pulp, generally from penetrating trauma.[2,10] Patients present with a tense, tender, swollen, erythematous finger pad, and severe throbbing pain.[8] Treatment involves incision and drainage.[10]

2. Herpetic whitlow: presents as a single vesicle or cluster of vesicles that arise on a digit after 3-4 days of skin irritation or minor trauma that have a clear or pale yellow appearance on an erythematous base.[11] The lesions are frequently located on the terminal phalanx of thumb, index, or long finger near the nail.[11]

3. Proximal onychomycosis: is a fungal infection of the nail that includes thickening, splitting, roughening, and discoloration of the nail.[6,12] Diagnosis is with KOH preparation for direct microscopy and isolation of organism in culture.[12]

4. Pyoderma gangrenosum: is a skin disorder that can occur on any location of the body, including the fingers and toes, and can develop as an erythematous pustule or nodule.[6,12] This lesion then rapidly progresses to form a necrotic ulcer.[12]

TREATMENT

Acute paronychia requires quick and effective treatment to prevent damage to the nail matrix.[1] If there is no evidence of abscess formation, treatment should start with warm compresses or antibacterial soap soaks of the affected digit three to four times a day for 10-15 minutes[2,13] The patient can apply a topical anti-staphylococcal antibiotic, such as mupirocin, gentamicin, neomycin, or polymyxin B for 5-10 days.[2,13] Aluminum acetate soaks can also help reduce edema and provide a hostile environment to bacteria.[1,2]

If acute paronychia presents with abscess formation, incision and drainage are indicated.[2,13] Antibiotics are not routinely required after performance of incision and drainage.[4] However, if marked cellulitis or a possible MRSA infection is suspected, specific antibiotic coverage is determined by the exposure.[4] If exposure to oral flora is suspected, treatment includes clindamycin 300-450 mg three to four times daily for seven days, amoxicillin-clavulanate 875/125mg every 12 hours or 500/125mg three times a day for seven days.[2,5] Without oral flora exposure, treatment includes dicloxacillin 250mg three times a day for seven days or cephalexin 500mg two to three times a day for seven days.[2] If MRSA is suspected, treat with trimethoprim/sulfamethoxazole 160/800mg two times a day for seven days or doxycycline 100 mg two times a day for seven days.[2,5] If there is no clinical response to incision and drainage and antibiotic therapy after 48 hours, surgical intervention under local anesthesia may be required, commonly due to a deeper infection.[1]

Chronic paronychia tends to be much more challenging to resolve.[7] Treatment success is contingent on lifestyle changes as well as education on proper hand protection to prevent the recurrent microtrauma and irritant exposure.[1,2,8] If patients have exposure to unsanitary or dirty conditions, hands should be washed and dried thoroughly.[7] If hands tend to become too dry, patients can apply a hand cream or moisturizer after washing.[7] In the past, treatment has focused on antifungals, but chronic paronychia is currently understood to be a form of hand dermatitis from environmental exposure, not necessarily due to the Candida infection itself.[8] Typically, once the nail barriers are healed the Candida species are no longer able to colonize.[14] Topical steroid creams are found to be the most efficacious with first-line treatment including moderately potent to potent topical steroids such as betamethasone 0.05% applied two times a day for 7-14 days or methylprednisolone aceponate 0.1% cream at bedtime.[2,8,14] An alternative treatment choice for the topical steroids includes include tacrolimus 0.1% ointment twice a day for 3-6 weeks.[8,14] If a fungal co-infection is suspected, treatment can consist of topical econazole, clotrimazole, or nystatin up to three times a day.[1,2,8] Treatment can be continued until a decrease in inflammation and noted reattachment of cuticle, which can take up to 3 months.[1,2,8] Systemic antifungals are rarely needed, but for more severe cases that include the nail, longer courses of antifungals such as itraconazole, terbinafine or fluconazole may be indicated.[2] Surgical management for severe cases is considered after failure of conservative measures and medical therapy.[1,8] Surgical procedures include eponychial marsupialization, en bloc excision of proximal nail fold, and Swiss roll technique.[1,8]

PREVENTION & PROGNOSIS

Prevention is best accomplished with patient education.[3] It is essential for patients to refrain from causing trauma to the fingernails by avoidance of nail biting, finger sucking, excessive manicuring, cutting of cuticles, and adhering to proper nail care.[3,15] Avoidance of excessive exposure of hands to damp conditions and wearing rubber gloves with a cotton liner may also assist with prevention.[2] Nail trimming should involve use of clean clippers or sharp manicure scissors to form a rounded edge for fingernails and straight across for toenails.[15] Trimming after a bath or shower makes the nails easier to trim, and cuticles should not be manipulated as this can introduce bacteria to the region.[15]

With prompt treatment, paronychia has a good prognosis.[3] Acute paronychia usually clears entirely in a few days and is rarely recurrent.[7] If left untreated infection can worsen and potentially (but rarely) lead to complications such as felon formation, septic tenosynovitis and osteomyelitis.[3] Immunosuppressed patients and those that have neglected to obtain proper treatment may be more prone to complications. Chronic paronychia may require months of treatment for clearance, and it can take up to a year for nails to resume normal growth.[7]

AUTHOR DISCLOSURES
No relevant financial affiliations.

REFERENCES

1. Richard B. Mallett. Paronychia . In: Mark G. Lebwhol MD, Warren R. Heymann, MD, John Berth-Jones, FRCP, Ian Coulson BSc, MB, FRCP, 4th ed. *Treatment of Skin Disease: comprehensive therapeutic strategies*. 4th ed. Edinburgh: Sauders Elsevier Limited; 2014: 542-544. http://www.clinicalkey.com/dura/browse/bookChapter/3-s2.0-C20110052407
2. Robert a. Baldor MD. Paronychia. In: Frank J. Domino, Robert A. Baldor, 21st ed., Standard ed. The 5-minute clinical consult 2013. Philadelphia, Pa.: Wolters Kluwer Health/Lippincott Williams & Wilkins 2013.
3. Elizabeth M. Billingsley MD. Paronychia. Medscape. http://emedicine.medscape.com/article/1106062-overview#a4. June 2016. Accessed August 25 2016.
4. Philip Buttaravoli MD, Stephen M. Leffler MD. Paronychia. In: Philip Buttaravoli, 3rd ed. Minor Emergencies. Philadelphia, PA: Elsevier/Saunders; 2012: Chapter 149, 591-596.
5. Glenn G. Fort MD, MPH. Paronychia. In: Fred F. Ferri MD, FACP, ed. Ferri's Clinical Advisor 2017. Philadelphia, PA: Elsevier; 2017: 936-936.
6. Wingfield E. Rehmus MD. Acute Paronychia. Merck Manual. https://www.merckmanuals.com/professional/dermatologic-disorders/nail-disorders/acute-paronychia. Nov 2013. Accessed August 25, 2016.
7. American Osteopathic College of Dermatology. Paronychia Nail Infection. http://www.aocd.org/?page=ParonychiaNailInfe. Accessed date 10/22/16.
8. Relhan V, Goel K, Bansal S, Garg VK. Management of Chronic Paronychia. Indian Journal of Dermatology. 2014;59(1):15-20. doi:10.4103/0019-5154.123482.
9. Piraccini, B.M., & Alessandrini, A. Drug-related nail disease. Clinics in Dermatology. 2013: 31(5): 618-626. doi:10.1016/j.clindermatol.2013.06.013
10. Daniel J.A. Thornton & Tommy Lindau. (iii) Hand Infections. Orthopaedics and Trauma. 2010; 24 (3): 186-196. doi:10.1016/j.mporth.2010.03.016
11. James H. Rubright MD & Adam B. Shafritz MD. The Herpetic Whitlow. Journal of Hand Surgery. 2011; 36(2): 340-342. doi:10.1016/j.jhsa.2010.10.014
12. Patterson, James W and Gregory A. Hosler. The vasculopathic reaction pattern: Pyoderma gangrenosum. In: Patterson, James W and Gregory A. Hosler, 4th ed Weedon's Skin Pathology. Elsevier; 2016: Chapter 8.
13. Ritting AW, O'Malley MP, & Rodner CM. (2012). Acute paronychia. *The Journal Of Hand Surgery*, *37*(5), 1068-70; Quiz Page 1070. doi:10.1016/j.jhsa.2011.11.021
14. Iorizzo, M. Tips to Treat the 5 Most Common Nail Disorders: Brittle Nails, Onycholysis, Paronychia, Psoriasis, Onychomycosis. *Dermatologic Clinics*. 2015;*33*(2), 175-183. doi:10.1016/j.det.2014.12.001
15. Clevland Clinic. Paronychia (Nail Infection). http://my.clevelandclinic.org/health/diseases_conditions/hic-paronychia-nail-infection. Accessed date 10/22/16.