



## Clinical cases of paronychia infection: A narrative review

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### Article Info

#### Article history:

Received: March 22, 2024

Revised: July 05, 2024

Accepted: August 02, 2024

Published: August 30, 2024

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#### Keywords:

Acute

Nail Infection

Paronychia

Retronychia

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### Abstract

Paronychia is an infection that occurs in the nail fold and the barrier between the nail and cuticle, is usually caused by penetrating trauma, which allows pathogens to infect and cause damage. The infection is caused by chemical factors, such as fungi, viruses, and bacteria, and risk factors, such as occupation, allergies, and finger-biting habits. Paronychia is a common nail infection that can significantly impact quality of life and work productivity, especially in certain occupations. Paronychia infection was differentiated by two categories, acute and chronic infection. The lack of knowledge regarding the prevention, cure, and rehabilitation of paronychia infection in Indonesia is the cause of the increasing cases of this infection. This review aims to provide knowledge for the Indonesian public and an opportunity for health workers to explore paronychia cases in Indonesia. The data in this paper were retrieved from 32 articles from 2014–2024 from PubMed, Cochrane, and Scopus. Articles were selected based on relevance to clinical cases of paronychia in humans, focusing on diagnosis, treatment and outcomes. Then, evaluate the causes, diagnosis, and treatment of paronychia using narrative review. Found that acute paronychia results from trauma or infection, while chronic cases are often caused by fungi. Treatment in acute paronychia is done with warm soaks and oral antibiotics, while chronic requires long-term topical corticosteroids and antifungal treatments. This review analyzes clinical cases of acute and chronic paronychia to evaluate their causes, diagnosis, and treatment. Further research is needed to advance the knowledge and treatment of paronychia infections.

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**To cite this article:** Jusivani, S. T., Wardani, I. K., Rahayu, T., Sari, N. I. P., & Maruyama, F. (2024). Clinical cases of paronychia infection: A narrative review. *International Journal of Applied Mathematics, Sciences, and Technology for National Defense*, 2(2), 61-72

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## INTRODUCTION

Paronychia is an infection in the nail fold and the barrier between the nail and the nail fold (cuticle) with or without abscess formation that can cause acute or chronic disease ([Rerucha et al. 2019](#)). This condition needs to be considered as a health problem caused by mechanical or chemical factors such as fungi, viruses, and bacteria and risk factors such as work, certain medications, and habits so that history and diagnosis can be made for long-term treatment with monitoring laboratory tests to avoid complications. Paronychia affects approximately 3-5% of the general population annually, with higher rates among healthcare workers, beauticians, and agricultural workers. Paronychia can cause significant pain, limit manual dexterity, and in severe cases, lead to lost workdays and decreased productivity.

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The types of paronychia infection are acute and chronic paronychia. Acute paronychia results from trauma or infections affecting the nail area, including manicures and pedicures, bacteria, viruses, fungi, structural abnormalities, and inflammatory diseases of the nail. Penetrating trauma to the hands and feet, which allows pathogens to infect and cause damage and contributes to the development of infection if proper diagnosis and treatment are not carried out. Organisms will infect the moist crevices of the nail and colonize the area. The majority of acute paronychia is caused by trauma, nail-biting, artificial nails, and foreign bodies left behind. Infection is most commonly caused by *Staphylococcus aureus* bacteria ([StatPearls, 2022](#)). While, Chronic paronychia or onychomycosis is commonly characterized by symptoms that last about six weeks due to dermatitis irritation of the damaged nail shield, resulting in discomfort, reddish nails, swelling, and pain in nail folds due to nail plate damage. Chronic paronychia is caused by microorganisms in the form of *Candida albicans* ([Bahunuthula et al. 2015](#)). But, both paronychia usually affect fingernails, while ingrowth of the nail bed due to abnormal growth of the nail plate (onychocryptosis) is more common in toenails ([Relhan & Bansal, 2022](#)). Treatment of paronychia can be challenging due to antibiotic resistance and recurrence rates of up to 30% in chronic cases ([Engin et al. 2018](#)).

The most common infective organism causing paronychia is *Staphylococcus aureus*, followed by *Streptococcus pyogenes*, *Pseudomonas*, gram-negative bacteria, and *Candida albicans* ([Tosti et al. 2014](#); [Leggit, 2017](#)). Paronychia infection can be characterized by different symptoms depending on the microorganism causing it, example paronychia infections caused by *Pseudomonas* microorganisms can be identified by the discoloration of the nail bed to greenish ([Lee et al. 2021](#)). Whereas *Staphylococcus aureus* microorganisms are more commonly found in cases of acute paronychia characterized by symptoms such as tenderness, swelling, and redness of the proximal nail fold, cuticle, eponychium, and perionychium ([Srivastav et al. 2023](#)). Meanwhile, *Candida albicans* microorganisms are found in cases of chronic paronychia that attack the nail fold characterized by the absence of cuticles and swelling and erythema in the proximal nail fold ([Bahunuthula, et al. 2015](#)).

Currently, Indonesians consider paronychia as a minor problem, so the pain gets worse when continuing activities, such as wearing closed shoes, exercising, and wearing tight socks. This condition results in redness and swelling that not only interferes with daily activities but also increases pain. This is especially true in people with diabetes as the disease has the potential to damage nerves and reduce blood flow to the feet or hands. Lack of knowledge regarding the difference between acute and chronic paronychia treatment is the main cause of the infection not curing. There are still many people who only cure it by soaking their feet in warm water with salt. However, if there is no further treatment this infection will become more visible with pus and swelling that does not subside, requiring surgery and greater costs.

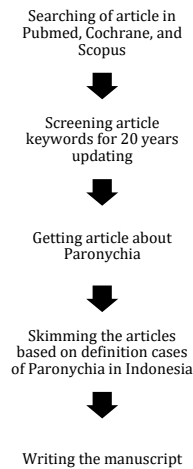
This review discusses paronychia infection, such as the clinical features of acute and chronic paronychia, including symptoms and diagnosis, clinical case reports, prevention, and appropriate treatment. There are differences in the treatment given to patients with acute and chronic paronychia infections due to differences in the characteristics of the infecting microorganisms. However, from the literature collected, the number of case reports of paronychia infection in Indonesia is still unclear, so further research is needed. This review analyzes clinical cases of acute and chronic paronychia to evaluate their causes, diagnosis, and management. Further research is needed to advance the knowledge and treatment of paronychia infection.

## METHOD

The data used in this paper is secondary data obtained from the results of research conducted by previous researchers. The sources of secondary data obtained are in the form of reputable articles or journals that discuss clinical cases of paronychia in the world that are recorded in a comprehensive search in major scientific databases, namely PubMed, Cochrane, and Scopus. The search uses relevant keywords such as clinical cases of Paronychia, evaluation of causes, diagnosis, and treatment of paronychia using narrative reviews, relevant review articles, original articles, and case reports/series published until 2024 to make it easier to determine the articles or journals used.

The inclusion criteria used in this review include the latest research, especially those published after 2019, peer-reviewed studies that mention the diagnosis, treatment, and causes of infection

published in international journals and published in English. The exclusion criteria in this study were non-English, articles that could not be fully accessed, published before 2019 and grey literature.



This review includes 121 articles published between 2014 and 2024, mainly describing clinical cases of human nail paronychia sourced from the PubMed, Cochrane, and Scopus databases. Searching for articles or journals using keywords used to expand the search to make it easier to filter the articles or journals used. The keywords in this review are "acute paronychia", "chronic paronychia", "microorganism causing edema and erythema of the nails", "nail diseases", "management and treatment of paronychia", and "normal nail structure". The search results obtained were then screened based on quality adjustments and eligibility to the inclusion and exclusion criteria, resulting in 32 articles that could be used in the literature review. Articles were selected based on their relevance to clinical cases of human paronychia. Data were extracted independently by two reviewers, with differences resolved through discussion. Then an analysis was carried out on the contents of the journal contained in the research objectives and research results.

## RESULTS AND DISCUSSION

The classification of paronychia is based on clinical cases. There are two types of paronychia infection: acute and chronic paronychia. Acute paronychia results from trauma or infections affecting the nail area (bacterial, viral, and fungal) such as the microorganisms *Staphylococcus aureus*, *Streptococcus pyogenes*, *Pseudomonas aeruginosa*, and even viruses such as herpes simplex (herpetic whitlow). Meanwhile, chronic paronychia causes dermatitis irritation of the damaged nail shield, resulting in discomfort, reddish nails, swelling and pain in the nail folds due to nail plate damage by microorganisms of *Candida albicans*. Although both are caused by different microorganisms, the symptoms are similar in that there is damage to the protective barrier of the nail folds.

### Acute Paronychia

Acute paronychia infection occurs due to damage to the proximal nail fold layer and nail plate which allows a way for microorganisms to infect, usually, acute paronychia infects one finger at a time. Trauma to the cuticle or nail fold, direct or indirect, is the most frequent cause of acute paronychia. This trauma can occur due to habits or activities carried out in daily activities, such as injuries from burrs or splinters that injure the nail, ingrown nail structures, manicures (cutting or removing cuticles), and the habit of biting nails or sucking fingers. This trauma occurs within 2 - 5 days, after which the patient will experience symptoms such as tenderness in the proximal nail fold and perionychium quickly, then erythema and edema and inflammation of the nail bed occur. (Figure 1(b)). The proximal nail fold is a thicker layer of skin that is at the base of the nail before the cuticle. The top of the proximal nail fold has normal skin, while the skin along the underside is thinner. The cuticle is a layer and structure thicker and more prominent than the proximal nail fold. It's clear and attached to the nail (Figure 1(a)) ([de Berker et al. 2019](#)). These two layers function as a seal between the matrix and the nail to avoid allergens, irritants, toxins, and microbial infections. When this seal is damaged, allergens, irritants, and especially microbes will enter and infect the nail bed.

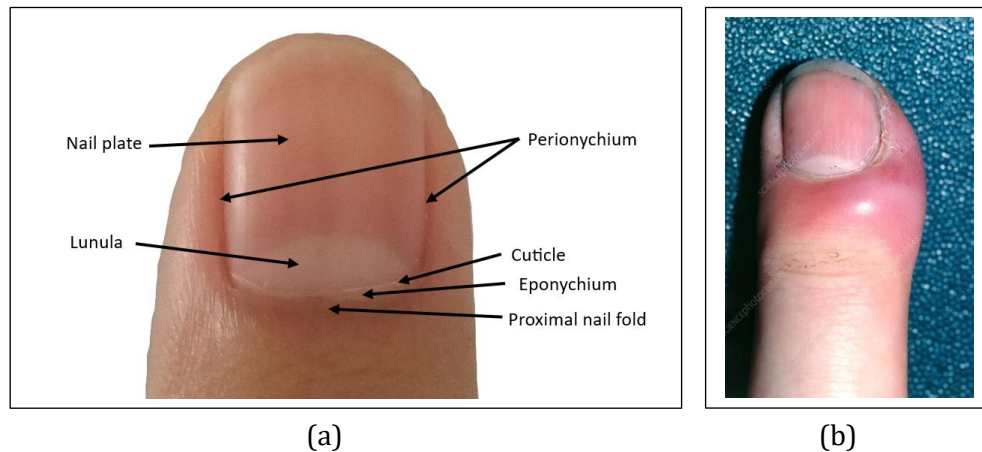


Figure 1. a) Anatomy of the nail; b) Acute paronychia on fingernail (Science Photo Library)

Microorganisms such as *Staphylococcus aureus* are the most frequent pathogen in cases of acute paronychia, followed by *Streptococcus pyogenes* and *Pseudomonas* spp (Fuchsjäger *et al.* 2019). The symptoms caused by these microorganisms have different characteristics due to their different pathogenicity. Nail beds that turn greenish and blackish-brown lunules and nail plates slowly swell into a circle are signs of paronychia infection caused by *Pseudomonas* bacteria (Lee *et al.* 2021). Meanwhile, *Staphylococcus aureus* germs are more commonly found in cases of acute paronychia, which is characterized by symptoms such as yellowish-white nails, inflammation of the skin around the nail, the appearance of pus, and discomfort in the proximal nail fold, swelling, and redness (Srivastav *et al.* 2023). Pus may be released when the nail fold is pinched in patients with paronychia, indicating that they may initially have only a superficial infection and buildup of purulent material under the nail fold (Figure 1(b)). Untreated infection may develop into a subungual abscess, which causes inflammation and pain in the nail matrix. As a result, the nail plate may undergo temporary or permanent dystrophy. Elevation of the nail plate may result from the development of pus that proximally separates the nail from the underlying joint (de Berker *et al.* 2019). In addition, to distinguish the pathogenicity between *Staphylococcus aureus* and *Streptococcus pyogenes*, pus samples were taken around the proximal nail fold and perionychium. Streptococcal lesions contain hyaluronidase and are usually diffuse, but *S. aureus* lesions are more likely to be confined. As DNase breaks down DNA, pus in streptococcal lesions tends to be more serious than *staphylococcal* lesions. Then, through the catalase test in the biochemical test, it was discovered that *Staphylococcus aureus* was positive, while *Streptococcus pyogenes* was negative.

### Chronic Paronychia

Chronic paronychia is a chronic inflammation of the periungual tissue that primarily affects women and diabetic and immunocompromised subjects (Relhan & Bansal, 2022). Chronic paronychia is caused by mechanical or chemical factors and sometimes infectious etiology like a fungal infection, especially *Candida* species. Risk factors include occupation (dishwasher, bartender, housekeeper), certain medications, and immunosuppression (diabetes, HIV, malignancy). This disease is characterized by inflammation that must be accompanied by fluid or pus discharge from the proximal folds. This was a monocentric retrospective study, conducted in the dermatology department of Casablanca University Hospital between April 2006 and January 2018. All cases of chronic paronychia diagnosed during this period were included. One hundred sixty-four cases were collected, including 126 women and 38 men (sex ratio (M/F) of 0.30) and a mean age of 40 years with extremes of 1.5 to 73 years. Forty-five patients (27.4%) were followed for diabetes or immunosuppression. Exposure to irritants was observed in 75 patients (45.7%). Fingernails were affected in 159 patients (98.8%). Five cases (3%) presented toenail attacks, isolated in 2 cases or associated with hand attacks in 3 cases. Polydactyl involvement was noted in 102 cases (62.2%) (Errajiet *et al.* 2020).



Figure 2. Chronic Paronychia ([Leggit, et al. 2017](#)).

According to Bahunuthula *et al.* (2015), *Candida albicans* microorganisms are present in cases of chronic paronychia that affect the nail fold and are characterized by swollen and erythema in the proximal nail fold and the absence of cuticles (Figure 2). Symptoms include the cuticle separating from the nail plate, making the layer between the proximal nail fold and the nail plate susceptible to pathogenic fungal infection and causing the nail plate to break down, yellow, and harden. This infection can result from direct contact with chemicals, such as soaps, detergents, porcelain cleaners, and other chemicals, or the use of medications. Chronic paronychia results from recurrent acute paronychia.

The table below compares acute and chronic paronychia, highlighting their distinct causes, symptoms, and treatment approaches. Acute paronychia is characterized by a sudden onset of bacterial infection, often leading to pain, redness, and swelling around the nail fold, requiring immediate interventions such as warm soaks, drainage, and antibiotics. In contrast, chronic paronychia develops gradually due to prolonged exposure to moisture or irritants, often involving fungal infections, and demands ongoing management with antifungal treatments, protective measures, and addressing underlying skin conditions (Table 1). This comparison underscores the importance of recognizing and treating each type effectively to ensure proper nail health and prevent complications.

**Table 1.** The Acute vs Paronychia Comparison

Feature	Acute Paronychia	Chronic Paronychia
Cause	Bacterial infection (often <i>Staphylococcus aureus</i> )	Repeated exposure to moisture, irritants, or allergens (commonly <i>Candida</i> species)
Onset	Sudden	Persistent
Symptoms	Redness, swelling, pain, pus	Inflammation, swelling, possible bacterial superinfection
Initial Management	Warm water soaks, incision, and drainage if abscessed	Keep area dry, avoid irritants
Medication	Oral antibiotics (e.g., cephalexin, dicloxacillin, clindamycin for MRSA)	Topical antifungal agents (e.g., clotrimazole), topical corticosteroids Oral antifungal medications (e.g., fluconazole)
Severe/Resistant Cases	-	
Preventive Measures	Good nail hygiene, proper nail trimming	Good nail hygiene, avoid nail-biting or picking, use barrier creams
Specialist Referral	May be needed for complicated cases	May be needed for severe or resistant cases
Cause	Bacterial infection (often <i>Staphylococcus aureus</i> )	Repeated exposure to moisture, irritants, or allergens (commonly <i>Candida</i> species)

### Bacterial vs Virus Nail Infection

Viral nail infections are predominantly caused by the *herpes simplex virus* (HSV) and exhibit distinct clinical symptoms. The infection often starts with a tingling or burning sensation around the nail, followed by the development of small fluid-filled blisters that can merge into larger sores. These

lesions are typically painful and can be accompanied by systemic symptoms such as fever and general malaise, especially in more severe cases ([Kimberlin & Rouse, 2016](#)). HSV is usually transmitted through direct contact with infected bodily fluids or lesions, making individuals who frequently encounter such exposures, like healthcare workers, particularly vulnerable ([Abzug, 2020](#)). Confirming a diagnosis involves a Tzanck smear or polymerase chain reaction (PCR) testing to detect the presence of viral DNA. Treatment primarily consists of antiviral medications such as acyclovir or valacyclovir, which help to reduce the severity and duration of symptoms ([Lupinacci, 2021](#)).

In contrast, bacterial nail infections, commonly known as bacterial paronychia, are usually caused by *Staphylococcus aureus* or *Streptococcus* species. These infections generally develop from minor injuries to the skin around the nail, such as cuts or abrasions that can occur from nail biting, manicures, or other minor traumas ([Rigopoulos et al. 2019](#)). Clinically, bacterial paronychia is characterized by redness, swelling, and pain around the nail, often with pus formation. The affected area may also feel warm, indicating an acute inflammatory response. Diagnosis is usually made by clinical checkup, and if necessary, culturing the pus to identify the specific bacterial pathogen. Treatment usually involves the use of oral or topical antibiotics like amoxicillin-clavulanate or mupirocin, and in some cases, drainage of any abscesses is required to alleviate symptoms and prevent further complications ([Khan et al. 2019](#)).

### Cases of Paronychia

Paronychia is an infection that affects the periungual tissues surrounding the nails, presenting significant challenges in both diagnosis and treatment due to its varied etiology and clinical manifestations. The following table provides a comprehensive comparison of different studies on paronychia infection, highlighting diverse causes, modes of transmission, and key findings from the research. These studies span various demographics and settings, offering insights into the epidemiology, microbiological profiles, and clinical management of paronychia. By analyzing the data from multiple sources, this table aims to underscore the multifactorial nature of paronychia and the importance of tailored treatment approaches based on specific etiological factors and patient characteristics (Table 2).

**Table 2.** Comparison Study of Paronychia Infection

Title	Causes	Transmission	References
Microbiological analysis of epidermal growth factor receptor inhibitor therapy-associated paronychia	A total of 20 identified of different species, including 72% Gram-positive bacteria, 23% Gram-negative bacteria and 5% Candida species	Based on clinical analysis of 42 smear tests taken from a total of 48 cases of paronychia infection occurring in 27 of 152 patients treated with cetuximab (2004–2009) at Ludwig-Maximilian University	<a href="#">Eames, et al. (2010)</a>
Using a novel scoring system for paronychia related to oncologic treatments (SPOT) for assessing paronychia severity and its correlation with pain index and quality of life	Oncology treatment is a contributing factor to the development of paronychia infection	A total of 90 cases of paronychia infection in 3 different medical centers in Taiwan: National Taiwan University Hospital, National Cheng Kung University Hospital and the Koo Foundation Sun Yat-Sen Cancer Center (December 2015 - October 2016) were included dominance in:  Sex: 53 Women (58,9%) and 37 men (41,1%)  Age: the mean age of patient is 60,1 (11,5) years old	<a href="#">Ho, P. et al. (2019)</a>
Imbalanced Dermic Microbiome Aggravates Inflammation in Toenail Paronychia	No significant difference in living habitat (smoking and drinking) In this study, the pathogens causing paronychia infection	A total of 70 cases of paronychia with a mild and severe inflammation were included dominance in:	<a href="#">Li, Y. et al. (2021)</a>

	were dominated by <i>Corynebacterium</i> (19.68% ± 4.69%) in mild infection and <i>Staphylococcus</i> (17.21% ± 3.88%) in severe infection.	Sex: Male by 27 cases (18–69 years old) in severe inflammation and 18 cases (18–51 years old) in mild inflammation  Paronychia severity index: Edema (2.95 ± 0.12) in severe inflammation and nail fold (2.83 ± 0.02) in mild inflammation	
Cross-Sectional Analysis of Paronychias in the National Electronic Injury Surveillance System 1999–2018	Ethiology: Manicure, pedicure and makeup brushes and tools by 337 cases (2013–2018) and other ethiology by 355 cases (2008–2013)  Pathogens: <i>Staphylococcus aureus</i> , <i>Eiknella corrodens</i> , and nonbacterial organisms like <i>Candida albicans</i> or herpes simplex	A total of 2,512 cases of paronychia (1999–2018) were included dominance in the final analysis:  Age: 0 - 19 years by 381 cases (2008–2013)  Sex: Man by 532 cases (2008–2013)  Finger affected: thumbs by 98 cases and great toe by 130 cases (2008–2013)	<a href="#">Desai, et al. (2022)</a>

This table compares studies on paronychia infections, highlighting microbiological, oncologic, and demographic factors. The first study by Eames *et al.* (2010) identified various bacterial species in patients treated with cetuximab, noting a predominance of Gram-positive bacteria. Ho *et al.* (2019) linked oncology treatments to paronychia, with a study in Taiwanese medical centers revealing a higher incidence in women and an average patient age of 60.1 years. Li *et al.* (2021) focused on the dermic microbiome, identifying *Corynebacterium* in mild cases and *Staphylococcus* in severe cases, with detailed inflammation severity indices. Desai *et al.* (2022) analyzed national data, associating paronychia with cosmetic procedures and diverse pathogens, and noted that younger males were more commonly affected, with infections frequently occurring on thumbs and great toes. These studies collectively demonstrate that paronychia infections are influenced by microbiological species, oncology treatments, dermic microbiome imbalances, and cosmetic procedures, with demographic variations in prevalence and severity.

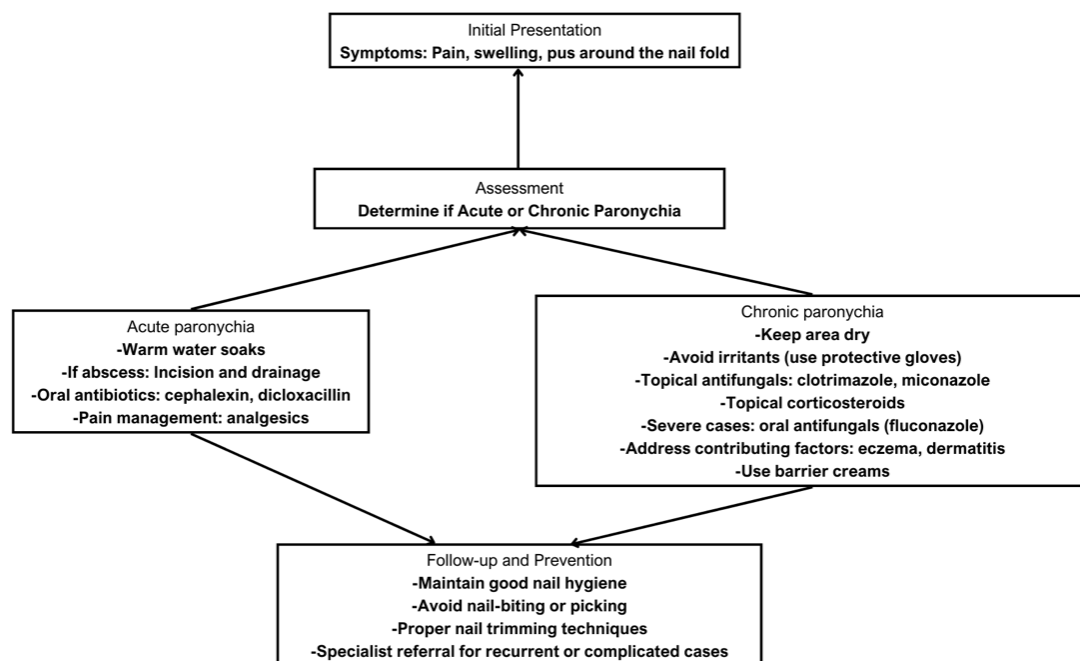
Prevention of paronychia infections involves a combination of proper nail care, environmental awareness, and patient education. Individuals should be advised to keep their nails neat and smooth, avoiding trauma such as nail biting or picking, which can carry bacteria. It is important to protect hands from prolonged contact with moisture and irritants by wearing rubber gloves, especially for those whose work involves frequent hand washing or contact with chemicals ([Dulski et al. 2019](#)). Patients should be educated on the importance of maintaining hygiene by keeping the affected area clean and dry, as well as moisturizing the skin around the nail to prevent cracking. Additionally, those with underlying health conditions, such as diabetes, must manage their blood sugar levels effectively to reduce the risk of infection. Regularly educating patients about these strategies can significantly reduce the incidence of acute and chronic paronychia ([Leggit, 2017](#)).

Healthcare providers should also emphasize the importance of choosing a reputable nail salon and following strict hygiene practices to minimize the risk of infection from cosmetic procedures. Patients should be taught how to properly care for their nails at home, using sterilized tools and gentle techniques ([Relhan et al. 2014](#)). For those prone to chronic paronychia, avoiding irritants and using protection, such as cotton-lined gloves, may be beneficial. Education about recognizing early signs of infection and seeking timely medical advice can help treat this condition before it becomes severe ([Rigopoulos et al. 2021](#)). By incorporating these comprehensive preventative strategies into routine patient care, healthcare providers can help individuals maintain healthy nails and reduce the overall burden of paronychia infections. Regular follow-up and reinforcement of these practices are essential for prevention and long-term maintenance ([Loureiro et al. 2020](#)).

### Different Treatment of Acute and Chronic Paronychia

The treatment of acute and chronic paronychia, two distinct types of nail fold infections, involves different approaches tailored to their respective etiologies and presentations (Figure 3). Acute paronychia is typically a bacterial infection, often caused by *Staphylococcus aureus*, and arises suddenly, presenting with redness, swelling, pain, and pus around the nail fold. Immediate treatment focuses on reducing the infection and relieving pain (Leggit, 2017). Initial management includes warm water soaks, which help to reduce swelling and promote drainage of pus. If an abscess has formed, incision and drainage are necessary to remove the accumulated pus. Oral antibiotics, such as cephalexin or dicloxacillin, are prescribed to target the bacterial infection, and in cases of methicillin-resistant *Staphylococcus aureus* (MRSA), clindamycin or trimethoprim-sulfamethoxazole may be used. Analgesics are also recommended to manage pain (Ritting et al. 2019). Recent studies show that topical mupirocin is as effective as oral antibiotics for mild cases of acute bacterial paronychia, with fewer side effects (Srivastav et al. 2023). Oral antibiotics, while effective, carry risks of gastrointestinal side effects and antimicrobial resistance. Topical treatments have fewer systemic side effects but may require longer treatment durations.

While acute paronychia often responds to warm soaks and oral antibiotics, chronic paronychia may require long-term topical corticosteroids and antifungal treatments. Treatment focuses on addressing the underlying cause and managing inflammation. Patients are advised to keep the affected area dry and avoid irritants by using protective gloves during activities involving water or chemicals. Topical antifungal agents, such as clotrimazole or miconazole, treat *Candida* infections, while topical corticosteroids help reduce inflammation (Loureiro et al. 2020). In severe or resistant cases, oral antifungal medications like fluconazole may be necessary.



**Figure 3.** Flowchart of The Diagnostic and Treatment for paronychia

Additionally, addressing contributing factors such as eczema or dermatitis is important, and patients may benefit from barrier creams to protect the skin. For both acute and chronic paronychia, maintaining good nail hygiene, avoiding nail-biting or picking, and ensuring proper nail-trimming techniques are crucial preventive measures (Bahunuthula et al. 2015). In recurrent or complicated cases, referral to a dermatologist or a specialist in nail disorders may be warranted for further evaluation and management. Overall, while acute paronychia requires prompt infection control and symptomatic relief, chronic paronychia demands a more prolonged and multifaceted approach focused on eliminating predisposing factors and managing inflammation to achieve effective and lasting results (Engin et al. 2018).

### Effect of Paronychia Infection

The economic burden of paronychia and its impact on quality of life includes direct treatment costs and indirect costs from lost productivity, estimated at Rp. 35000 on public health centers up to Rp. 30 million on hospital per case annually. Based on the results of the data, it means that paronychia infection influences the economic life of the community because it requires quite high costs, such as treatment up to rehabilitation after surgery. In addition, during medication, patients are advised not to do heavy activities, use open-toed footwear, and take regular medication. So that can affect the patient's quality of life. The lack of knowledge regarding paronychia infection among the public, especially the lower middle class and children has led to an increase in paronychia cases in Indonesia. Many people assume that if this infection is left untreated, it will dry out and heal on its own, this assumption is wrong because it will cause this infection to worsen and have implications for the nail to be detached and blood flow to certain areas of the body is disrupted, causing body tissue to die (gangrene). Thus, socialization related to paronychia infection in the community is important to prevent an increase in cases of paronychia infection. Preventive strategies include proper hand hygiene, avoiding prolonged water exposure, and using protective gloves in high-risk occupations. Surgical for chronic paronychia and Ultrasound technology can be an innovative approach that can improve the diagnosis or treatment of paronychia infections by allowing the evaluation of nail components with visualization to detect the presence of abscesses or cellulitis. Thus, pre-surgical, surgical follow-up and post-surgical can be performed using this technique. If the abscess and cellulitis in the nail have dried up, oral antibiotic consumption is no longer required ([Relhan et al., 2022](#)). For middle to lower-class people who cannot afford surgery, treatment of this infection can be done by soaking the infected area in warm water for about 15 minutes a few times a day.

### CONCLUSION

Paronychia infection is divided into two categories, acute and chronic infection. Usually, this infection infects the human nails. Acute and chronic cases of Paronychia can occur not only from trauma but also from being infected by pathogen microbes. Acute paronychia results from trauma or infection and occurs within 2 - 5 days, after which the patient will experience symptoms such as tenderness in the proximal nail fold and perionychium quickly, then erythema, edema, and inflammation of the nail bed occur. While chronic cases are often caused by fungi, this infection results from recurrent acute paronychia and is characterized by inflammation fluid or pus discharge from the proximal folds. Recent studies show that topical mupirocin is as effective as oral antibiotics for mild cases of acute bacterial paronychia, with fewer side effects. While acute paronychia often responds to warm soaks and oral antibiotics, chronic paronychia may require long-term topical corticosteroids and antifungal treatments. Treatment focuses on addressing the underlying cause and managing inflammation. Future-specific detection is critical to the early determination of the treatment.

There are obstacles in the review methodology in the form of limited recent literature related to paronychia cases in Indonesia so that it can be considered for further research. Recommendations for clinical practice include educating the Indonesian public regarding nail care and wound care management, while research priority recommendations include the need to identify and study molecular biomarkers and new therapeutic approaches for paronychia cases.

### AUTHOR CONTRIBUTIONS

Each author of this article played an important role in the process of method conceptualization, simulation, and article writing.

### CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest.

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