Severe kerion celsi effectively treated with skin debridement and antifungals

Ismiralda Oke Putranti1,2, Citra Primanita2

1 Department of Dermato-venerology, Faculty of Medicine, Universitas Jendral Soedirman, Central Java, Indonesia
2 Prof. dr. Margono Soekarjo General Hospital, Purwokerto, Central Java, Indonesia

Email: okkehoes@gmail.com

Abstract

Background: Kerion celsi is a severe inflamed deep abscesses form of tinea capitis which mostly occurs in children population. Despite good regular treatment with antifungals, the prognosis of kerion celsi is poor with scarring alopecia.

Case Illustration: A 5-year-old boy had history of a alopecia with locally large painful oedema on his scalp a month before treatment. From the physical examination, a painful large area with alopecia was found with abscess covered by thick crust. Pull test showed hair breakage and right retro-auricular lymphatic nodes enlargement was also found. Endo-ectothrix spores were positive in potassium-hydroxide examination and the culture showed colony of Trichophyton mentagrophytes. A surgical debridement was performed to remove the thick crust covering the abscess with alopecia and followed by application of normal saline gauze dressing and terbinafine cream on the top of the lesion for 6 weeks. Systemic micronized griseofulvin was also administered for 6 weeks. Combination treatment of debridement-topical and systemic antifungal gave a good result without scarring alopecia.

Discussion: Kerion celsi was diagnosed based on clinical findings and mycological examination. From the laboratory examination, a dermatophyte fungal infection was found. Skin debridement was performed to create a good environment for topical antifungal application and wound healing, with 20mg/kg bodyweight of systemic griseofulvin administered as the first line therapy for tinea capitis. A good prognosis was achieved after those treatments combination.

Conclusion: In this case, combination between skin debridement with topical and systemic antifungals gave a better result in treating kerion celsi.

Keywords: antifungals, kerion celsi, skin debridement, tinea capitis

Background

Kerion celsi is an inflammatory type of tinea capitis, caused by dermatophytes genera Trichophyton sp. and Microsporum sp. Kerion celsi represents delayed host inflammatory response to dermatophyte. It is characterized by solitary or multiple areas with alopecia and severe abscesses, boggy plaques, painful, studded with pustules and thick crust. It is also followed by regional cervical or occipital lymph nodes enlargement.1,2 Like general tinea capitis, kerion celsi also predominantly occurs among children. One third of tinea capitis patients develop kerion,3 and mostly it is caused by zoophilic dermatophytes such as Trichophyton verrucosum and Trichophyton mentagrophytes (T. mentagrophytes).4

Systemic antifungals such as griseofulvin and terbinafine are the first line therapies for any types of tinea capitis including kerion celsi, but in kerion, it is mostly healed with scarring and permanent alopecia.5 Surgical treatment is still being debated in treating kerion. Kerion is often misdiagnosed as another bacterial infection which will be undergone incision and drainage; however, it is not
recommended for treating kerion because it is unnecessary and inappropriate.6

Case Illustration

A 5-year-old Javanese boy was presented with a large painful swelling area with alopecia on his head. Prior history, he complained a focal hair loss without itch since a month before he came to the hospital. He was taken to general practitioner and was diagnosed as alopecia areata. He was treated with systemic and topical steroids for several weeks. The alopecia was wider and develop a painful swelling, covered with thick crust accompanied with mild fever. From the history taking, the boy had pets like cats and guinea pigs.

From the physical examination, there was a painful large boggy mass over the area with alopecia, studded with pustules and covered with thick crust, also right retro-auricular lymph nodes enlargement was found (Figure 1). With a light pull test, the hairs were breakage. Hair samples were taken and underwent examination with 10% potassium hydroxide. Endo-ectothrix spores were found along the hair shaft (Figure 2), confirming the diagnosis of kerion celsi. A culture was performed and revealed granular type of T. mentagrophytes as the cause of the kerion. (Figure 3).

Skin debridement was performed under general anesthesia prior to administration of systemic and topical antifungals. Remained hairs were shaved before the debridement. First, the scalp area was disinfected. The thick crust was removed using skin curettage, then the boggy mass was debrided with hydrogen peroxide, normal saline and povidone iodine (Figure 4). Micronized griseofulvin was given orally of 20mg/kg bodyweight (500mg once daily) and 1% topical terbinafine was applied twice daily. Antifungals treatments were administered for 6 weeks. For wound healing, normal saline gauze was applied to compress the boggy area for about 15 minutes prior to topical antifungal application. After 16 weeks, patient showed a great improvement with no scarring alopecia and healthy growth of all hairs (Figure 5).

![Figure 1](image1.jpg)

**Figure 1.** A 5-year-old boy with a large kerion celsi (before treatment)

![Figure 2](image2.jpg)

**Figure 2.** Examination with 10% potassium hydroxide showed endo-ectothrix spores along the hair shaft
Figure 3. Culture of granular subtype of *T. mentagrophytes*

Figure 4. Skin debridement was performed to remove the thick crust, using skin curettage, followed by cleaning the boggy mass area with hydrogen peroxide, normal saline, and povidone iodine. All remaining hairs were shaved.

Figure 5. After 16 weeks, hair grew within the area with alopecia without any scar formation.
Discussion

Kerion celsi was diagnosed based on the clinical history, clinical examination, and laboratory findings. A 5-year-old boy was found with progressive and painful swelling following inappropriate treatment of alopecia, which was undergone misdiagnosis for tinea capitis as alopecia areata, for which systemic and high potent topical steroid were administered. Similar as most literatures, tinea capitis occurs mostly in prepubertal children in crowded community and low socioeconomic setting.\(^1\)\(^2\) Systemic and topical steroid in fungal infection may induce clinical condition called tinea incognito or worsening of the clinical features.\(^7\)\(^8\) The steroids in fungal infection seem to dampen down inflammation and press local immune response, thus causing the dermatophytes to infect deeper into the skin, leading to worse, more extensive, pustules and irritable inflammation reaction.\(^9\) In this case, the use of steroids might be the predisposition factor for kerion development. Kerion may develop as a T-cell mediated hypersensitivity reaction due to the causative dermatophyte,\(^9\) or it is an abundant host’s immune response to fungal infection.\(^3\)

A large boggy mass upon area with alopecia, studded with pustules, covered with thick crust and right retro-auricular lymph nodes enlargement were found in physical examination. Classic kerion signs are painful, boggy, inflammatory mass with associated alopecia, may be solitary or multiple, suppurative and covered by a thick crust. It is also followed by regional cervical lymph nodes enlargement.\(^1\)\(^3\)

Endo-ectothrix spores were found in 10% potassium hydroxide hair shaft examination and culture revealed granular type of \textit{T. mentagrophytes} as the causative fungal species. \textit{T. mentagrophytes} is a zoophilic fungus with rodents as its definitive hosts.\(^10\) In this particular case, the patient was infected by his pets, guinea pigs or probably the cats. \textit{T. mentagrophytes} is commonly ectothrix, but it also may invade endothrix due to hair perforation.\(^10\)\(^11\) Granular subtype of \textit{T. mentagrophytes} is a high-grade infectious species, it produces elastase and proteolytic enzymes, inducing cytokine secretion (TNF-\(\alpha\), IL-1\(\beta\), IL-8 and IL-16), thus leading to severer inflammation and delayed hypersensitivity reaction as kerion.\(^12\)

Skin debridement was performed under general anesthesia, using skin curettage technique to remove thick crust upon boggy area, followed by debridement with hydrogen peroxide, normal saline and povidone iodine. The debridement’s objective is to remove necrotic tissue and other dead materials, thus preparing wound bed to promote healing process.\(^13\) Thick crust upon boggy mass may delay healing process in kerion celsi. Painful sensation made the patient uncooperative to be performed crust removal traditionally using normal saline compress; therefore it was the reason to perform surgical debridement under general anesthesia.

After debridement, griseofulvin was administered 20mg/kg bodyweight (500mg once daily dose) during meal and 2% topical terbinafine was applied on the lesion twice daily after applying normal saline gauze as a wet dressing for 15 minutes to keep the wound clean. Systemic and topical antifungals were administered for 6 weeks. Griseofulvin is a fungistatic drug, chosen as the first line therapy for tinea capitis including kerion celsi with micronized dosage recommendation of 20-25mg/kg bodyweight for 6-8 weeks.\(^1\)\(^3\)\(^10\) Griseofulvin is taken with fatty food to increase the absorption and bioavailability.\(^2\) Another first drug of choice for tinea capitis is terbinafine.\(^1\)\(^3\) Terbinafine is an allylamine, a fungicidal works on fungus’ cell membrane.\(^3\) In this case, terbinafine was also used topically for 6 weeks to adjust the griseofulvin treatment.

Kerion celsi is mostly cured with scarring alopecia\(^1\)\(^3\) and sometime remains recalcitrant,\(^5\) just like a case reported by Jaspers GJ et al. (2011). A severe kerion celsi in a 5-year-old girl was caused by \textit{T. mentagrophytes}. She received a long term systemic griseofulvin therapy. Unfortunately, she got reinfection and needed to re-start the systemic griseofulvin. During treatment, her kerion wounds were rinsed using silver sulfadiazine and absorbing gauzes under general anesthesia. She was cured with permanent wide area of alopecia.\(^5\) On the contrary to this case report, combination of skin debridement to remove the thick crust, systemic and topical antifungals gave a good result without any scarring alopecia after 16 weeks follow-up.

Conclusion

Combination therapy of skin debridement with systemic and topical antifungals may give a better result in treating kerion celsi.
References


