



Case Series

Cold Abscesses of the Newborn: A New Pathogenetic Hypothesis

Alessandra Gelmetti^{1,2*}, Silvia Galletti^{1,3}, Luigi Tommaso Corvaglia^{1,3}, Bianca Maria Piraccini^{1,2}, Filippo Viviani¹, Marco Adriano Chessa^{1,2}, Iria Neri²

¹Dermatology Unit, Department of Experimental, Diagnostic and Specialty Medicine, University of Bologna, Bologna, Italy

²Dermatology Unit, IRCCS Azienda Ospedaliero-Universitaria di Bologna, Bologna, Italy

³Neonatal Intensive Care Unit, IRCCS S. Orsola-Malpighi Hospital, Bologna, Italy

***Corresponding author:** Alessandra Gelmetti, Department of Medical and Surgical Science, Alma Mater Studiorum University of Bologna, Via Massarenti 5, Bologna (BO), Italy

Citation: Gelmetti A, Galletti S, Corvaglia LT, Piraccini BM, Viviani F, et al (2023) Cold Abscesses of the Newborn: A New Pathogenetic Hypothesis. Clin Exp Dermatol Ther 8: 208. DOI:10.29011/2575-8268.100208

Received Date: 17 July 2023; **Accepted Date:** 24 July 2023; **Published Date:** 28 July 2023

Abstract

Objective: Cold abscesses of the newborn are a benign and probably underdiagnosed condition. Affected patients are immunocompetent newborns without any previous history of pregnancy complications or systemic conditions. Diagnosis can be clinical and further investigations are not needed, unless clinically required. There is still no consensus on the etiopathology of the condition, the role of *Staphylococcus aureus* seems consolidated, together with the predisposing conditions of temperature and humidity of the skin folds. **Design:** Here we present three cases of cold abscesses of the newborn and an unprecedented pathogenetic hypothesis, based on clinical and dermoscopic findings. **Results:** black hair was found emerging from a cold abscess, suggesting a role of hair shedding in utero in the etiopathogenesis of this benign condition. **Conclusions:** The article describes three new cases of cold abscesses of the newborn, a rare and benign condition, which has to be distinguished from other similar entities. Furthermore, a new unprecedented etiopathogenetic hypothesis is proposed.

Keywords: This research received no specific grant from any funding agency in the public; commercial or not-for-profit sectors

Introduction

Cold abscesses are a recently described manifestation in immunocompetent newborns. Only 17 patients are reported in the literature and in all cases, the onset of the lesions is in the first few days of life, in good general conditions, and in uncomplicated pregnancies, with excellent outcome regardless of the type of treatment. The pathogenesis is unknown although several hypotheses have been postulated. We present three new cases seen in our hospital and we suggest a new cause.

Case Series

Patient 1

The first newborn was a male, born at 40 weeks from spontaneous delivery after an uncomplicated pregnancy. He came to our attention because of the onset, on the 9th day of life, of an inguinal red nodule. On clinical examination, an erythematous nodule on the left inguinal fold was observed, together with umbilical granuloma (Figure 1). The patient was otherwise in good health, afebrile, with adequate growth. An ultrasound of the lesions was performed, showing a cutaneous-subcutaneous hypoechoic round formation with a perimetric vascular ring,

consistent with adenitis. He was then admitted to our Neonatology Unit: blood cell count and biochemical analyses resulted within normal limits. Topical antibiotic therapy was started, with mupirocin cream applied on the lesions 3 times a day. During hospitalization, the inflammatory nodule underwent spontaneous fistulation, and a cutaneous swab for bacteria from the purulent discharge was taken. After three days of treatment, it began to disappear, with dimensional reduction. No new lesions appeared. After discharge, a 20-day of life-follow up was performed, and the newborn remained healthy with normal clinical examination.



Figure 1: erythematous nodule of the left inguinal fold and umbilical granuloma.

Patient 2

The second patient was a male of 12 days of life, born at 40 weeks, after a normal pregnancy. He was visited at the Neonatal Unit because of the onset of two bilateral nodular lesions of the inguinal folds (Figure 2). An ultrasound of the region was performed, showing two superficial lesions, with underlying reactive lymph nodes. In the clinical suspicion of an infectious process, systemic antibiotic therapy was started.

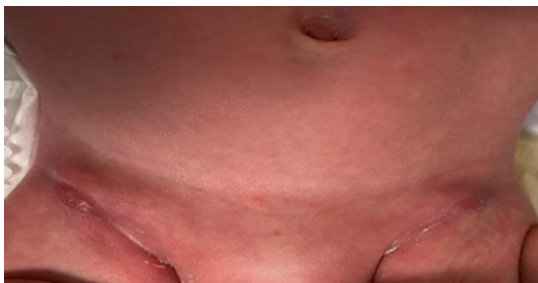


Figure 2: symmetrical erythematous nodules of the inguinal folds.

On dermatological examination, he presented two inguinal symmetric nodular lesions surrounded by mild erythema. On the right lesion, minimal surface erosion was observed. The patient was in good general health, afebrile, blood tests and abdomen ultrasound were within normal limits. A swab of the purulent discharge from the right inguinal abscess was taken and resulted positive for oxacillin-susceptible *S. aureus*, a nasal swab resulted negative and both anal and umbilical swabs resulted positive for *Morganella morganii*. Since the patient was already on antibiotics, no additional therapies were prescribed, apart from a gentle washing.

On the third day of hospitalization, the right nodule spontaneously drained through the skin and a swab from the material was collected. After 7 days, the lesions underwent progressive spontaneous resolution, no further lesions appeared and the newborn was discharged in good clinical conditions.

Patient 3

Patient 3 was a female of 12 days, who came to the pediatric dermatology outpatient because of the onset, 4 days earlier, of a single swollen lesion on her right inguinal fold. After an uncomplicated course, during the last days of pregnancy, the mother was prescribed systemic antibiotic therapy because of a placental rupture. At birth, the baby was in good clinical condition and all the clinical parameters were within normal ranges. On clinical examination, she presented a nodular swollen lesion on the right inguinal fold, surrounded by slight erythema (Figure 3a). The baby was otherwise healthy, afebrile, and quiet during the examination. Surprisingly, at dermoscopic examination, a short black hair was found, emerging from the nodule and not visible to the naked eye (Figure 3b). With the help of anatomic forceps, the hair was removed and, when observed on video dermoscopy, it showed the absence of roots (Figure 3c). Videodermoscopy has performed also around the lesion and on the contralateral inguinal fold, revealing the presence of further similar sparse rootless hairs. Diagnosis of cold abscess was made and the patient was discharged without further investigations needed.

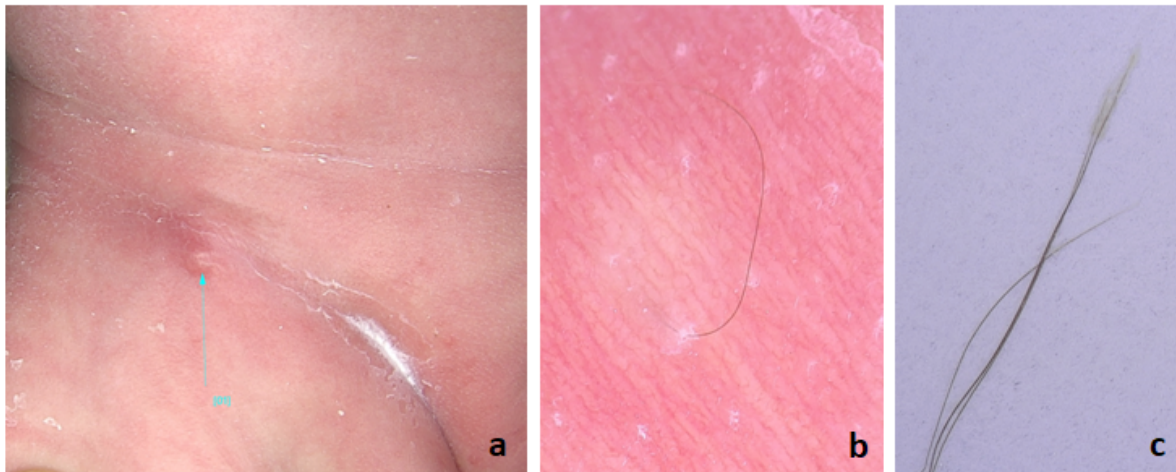


Figure 3: a: Nodular lesion on the right inguinal fold; b: dermoscopic image of a short black hair emerging from the nodule; c: dermoscopy of the hair, showing the absence of root.

Discussion

We presented three cases of cold abscesses of the newborn which share some features, such as the onset of the lesions within the first few days of life, healthy babies, uncomplicated pregnancies, and excellent outcomes regardless of the type of treatment. In the literature, less than 20 cases of cold abscesses are reported. Huber et al.1 described three patients who, similarly to our cases were in good clinical conditions and born from uncomplicated pregnancies but, unlike our patients, two of them developed multiple lesions in different body folds (supraclavicular fossa and axilla) and they all presented omphalitis. The latter data were hypothesized to be relevant in the overall clinical picture since the antibiotypes of the bacteria recovered in the umbilicus corresponded to those isolated from the skin abscesses [1]. On the contrary, in our experience, none of the patients suffered from omphalitis. Furthermore, of the 13 patients reported by Hubiche et al.2, only two presented omphalitis, two developed lesions on the neck, and one on the calf. *S. aureus* was isolated from all the abscesses and the authors believe it might be the cause of cold abscesses since its colonization of the skin folds starts from the first day of life favored by pH, humidity, and temperature conditions [2].

Recently, even the anamnestic data of maternal gestational diabetes has been considered a risk factor for infection of the newborn [3].

Several pathogenetic hypotheses have been postulated by authors and most agree that cold abscesses might be the result of a transient *S. aureus* bacteraemia from the umbilicus in immunocompetent hosts.

Based on our findings, cold abscesses might result from the penetration of hair shafts, taking place during the last months of fetus development inside the placenta. The deposition and accumulation of the shed hairs in skin folds, in association with *S. aureus* colonization after birth, might be responsible for the formation of the abscesses. In particular, this could be subsequent to the physiologic telogen wave shedding at 7 to 8 months in utero [4,5]. The latter is a well-known phenomenon that is part of the physiological hair cycle on “foetal hair”[6], consisting in the replacement of telogen lanugo hairs by the newly emergent anagen hair growth. Furthermore, based on a previous study evaluating clinical and dermoscopic features of scalp hair in newborns [5], we noticed a good hair density in our patient, assuming a significant lanugo hair shedding during the last few weeks of gestation.

It cannot be excluded that this finding was present in patients 1 and 2 because, since the inpatient regime, it has not been possible to perform video dermoscopy at the appropriate time.

Conclusions

Neonatal cold abscesses of the large folds are a rare clinical entity. The etiopathogenetic mechanism is still poorly understood, the role of *S. aureus* in causing an infection confined to the skin of immunocompetent newborns has been postulated.

Our findings of a potential role of fetal hair shedding might integrate and complete the previous etiopathogenetic hypotheses, once more confirming the benign origin of this rare skin condition.

Further studies are needed to confirm the role of skin hair inclusion as a pathogenetic hypothesis of the formation of cold abscesses.

References

1. Huber F, Léauté-Labrèze C, Lina G, Sarlangue J, Taieb A, et al. (2006) Multiple neonatal staphylococcal cold abscesses of the large folds. *J Eur Acad Dermatol Venereol* 20: 1197-200.
2. Hubiche T, Chiaverini C, Goujon E, Bourrat E, Bes M, et al. (2019) Multiple neonatal staphylococcal cold abscesses in large skin folds: a benign neonatal skin infection. *J Eur Acad Dermatol Venereol* 33: e125-e128.
3. Pegalajar García MD, Ródenas Herranz T, Pérez López I, Pleguezuelos FMR, Villaverde RR (2022) Asymptomatic nodules in body folds of a newborn. *Pediatr Dermatol* 39: 458-460.
4. Barth JH (1987) Normal hair growth in children. *Pediatr Dermatol* 4:173-184.
5. Neri I, Piccolo V, Cocchi G, Starace M, Patrizi A, et al. (2013) Hair in newborns and infants: clinical and dermoscopic evaluation of 45 cases. *Br J Dermatol*. 169: 896-900.
6. Cutrone M, Grimalt R (2005) Transient neonatal hair loss: a common transient neonatal dermatosis. *Eur J Pediatr* 164:630-632.