

The so-called Mongolian spots and suspected child abuse - difficulties in differential diagnosis

Tak zwane plamy mongolskie a podejrzenie przemocy wobec dzieci – trudności związane z diagnostyką różnicową

Szymon Rzepczyk^[1], Paweł Świdorski^[1], Damian Rusek^[1], Jakub Czerwik^[1], Ryszard Żaba^[2], Czesław Żaba^[1]

[1] **Department of Forensic Medicine, Poznan University of Medical Sciences, Poland**
Katedra i Zakład Medycyny Sądowej, Uniwersytet Medyczny w Poznaniu

[2] **Department of Dermatology and Venereology, Heliodor Swiecicki Clinical Hospital in Poznan, Poznan University of Medical Sciences, Poland**
Zakład Dermatologii i Wenerologii, Uniwersytecki Szpital Kliniczny im. Heliodora Świącickiego w Poznaniu, Uniwersytet Medyczny w Poznaniu

Abstract

The assessment of physical violence against children is an important issue in forensic medicine, particularly in the case of infants and toddlers, who, due to their stage of development, are unable to communicate the violence inflicted upon them. This case describes a two-week-old girl of Roma origin, who was transferred from a temporary to a foster family. While changing the child, the foster parents noticed bruises in the sacral area. Based on the initial assessment of these changes at the hospital, the authorities were notified and an investigation was initiated. The first court expert assessing the changes indicated that the image resembled resorbing haemorrhages resulting from trauma. Another team of experts, consisting of specialists in forensic medicine, dermatology and pathology, was appointed. Based on the analysis of medical records and a physical examination using a dermatoscope, pale-blue spots characteristic of the Mongolian spot were found in the lumbar and buttock areas. Mongolian spots are congenital developmental abnormalities classified as melanocytic naevi. In most cases, the changes appear immediately after birth or shortly thereafter. Clinically, a lesion appears as single or multiple spots on the lower back, sacrum, or buttocks. These lesions can range in colour from dark grey to blue-green and take on various shapes, such as round, oval, or irregular. Lesions on the skin of children can morphologically resemble bruises, so their evaluation requires special attention. In case of doubt as to the nature of the lesion, additional examination should be performed. Furthermore, the analysis of medical records and the evaluation by a dermatologist can be helpful.

Keywords

Mongolian spots, child abuse, congenital dermal melanocytosis, bruises, diagnostics difficulties

Streszczenie

Ocena stosowania przemocy fizycznej względem dzieci stanowi ważne zagadnienie w medycynie sądowej. Szczególne znaczenie ma to w przypadku niemowląt i małych dzieci, które ze względu na stopień rozwoju nie potrafią zakomunikować stosowania wobec nich przemocy. Opisany został przypadek dwutygodniowej dziewczynki pochodzenia romskiego przekazanej z rodziny tymczasowej do rodziny zastępczej. Rodzice zastępczy podczas przebijania dziecka zauważyli zasinienia w okolicy krzyżowej. Na podstawie wstępnej oceny zmian w szpitalu, powiadomione zostały odpowiednie organy i wszczęte zostało postępowanie. Pierwszy biegły oceniający zmiany, wskazał że obraz przypomina resorbujące się podbiegnięcia krwawe, które powstały na skutek urazu. Powołany został kolejny zespół biegłych składający się ze specjalistów: medycyny sądowej, dermatologii i patomorfologii. Na podstawie analizy dokumentacji i badania przedmiotowego z użyciem dermatoskopu stwierdzono występowanie w okolicy lędźwiowej i pośladkowej blado-sinich plam o charakterze plamy mongolskiej. Plamy mongolskie to wrodzone nieprawidłowości rozwojowe, należące do melanocytowych znamion skórnych. U większości zmiany pojawiają się tuż po urodzeniu lub krótko po nim. Znamię klinicznie objawia się jako pojedyncze lub wiele plamy w dolnej części grzbietu, okolicy krzyżowej lub na pośladkach. Zmiany te mogą mieć kolor od ciemnoszarego do niebiesko-zielonego i przybierać różne kształty, takie jak okrągłe, owalne lub nieregularne. Występujące na skórze dzieci zmiany mogą morfologicznie przypominać siniec, dlatego ich ocena wymaga szczególnej uwagi. W przypadku wątpliwości co do charakteru zmiany należy przeprowadzić dodatkowe badanie. Ponadto wsparciem może być analiza dokumentacji medycznej i ocena specjalisty dermatologii.

Słowa kluczowe

plamy mongolskie, przemoc wobec dzieci, wrodzona melanocytoza skórna, podbiegnięcie krwawe, trudności diagnostyczne

Introduction

The phenomenon of interpersonal violence, especially physical domestic violence, is a significant social problem [1]. The identification of violence against children is an important issue from the perspective of forensic medicine [2–6]. This is particularly important in the case of infants and younger children who are unable to report incidents of violence, especially physical violence, which may be committed by legal or actual guardians. Therefore, this issue concerns both the specific type of domestic violence committed by the closest relatives (e.g. parents) and violence in institutional care settings, such as kindergartens or nurseries, where the perpetrator may be a form teacher [2]. In cases where changes indicating the use of physical violence against a child are identified, it is crucial to notify the appropriate authorities and conduct a forensic medical examination to determine the nature of the marks on the body. However, assessing skin lesions that resemble bruises may pose significant diagnostic difficulties, especially in the youngest patients, due to the occurrence of congenital skin lesions that resemble bruises in this population [7]. In addition, some pathological changes may mimic traumatic injury [8].

Mongolian spots are congenital developmental abnormalities classified as melanocytic naevi [9]. The name 'Mongolian spots' originates from the mistaken belief that they are characteristic of Mongolian people. In reality, these naevi occur in children of various races, although they are more common in individuals with darker skin tones [10]. It is currently recommended to replace the term 'Mongolian spots' with 'congenital

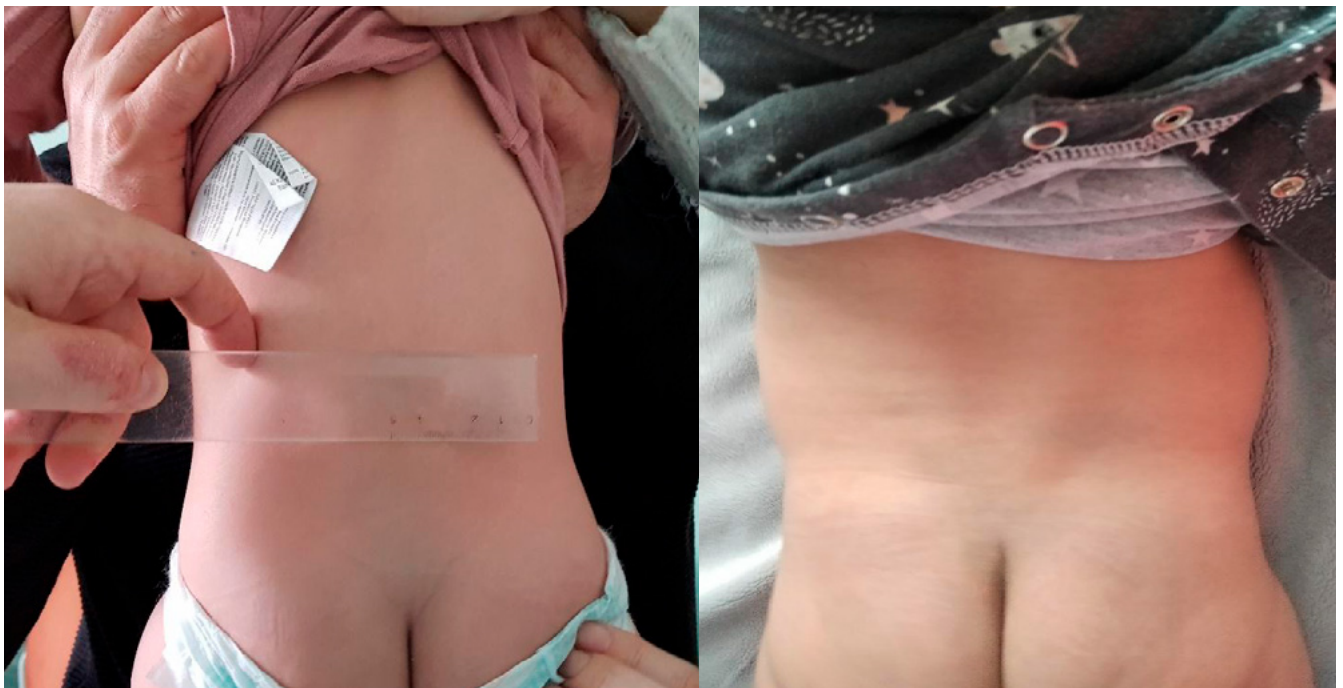
cutaneous melanocytosis' or to use descriptive terms such as 'blue-grey infantile spots' or 'ink spots', which do not stigmatize specific cultures, regions or ethnic groups [11–13]. Over the years, congenital cutaneous melanocytosis has been the subject of many legends. The oldest reports date back to the time of Hippocrates, who believed that the nevus was the result of abdominal trauma in pregnant women. A similar theory also existed in Turkey [14]. In Japan, the ink spot was once considered to be a consequence of sexual intercourse during pregnancy. In China and Kyrgyzstan, legends attribute the spots to divine forces gently striking a child while it is still in the mother's womb. According to Armenian tradition, when a woman works on certain days or when another woman criticizes her and touches her abdomen, the child is born with a mark [15].

Case description

Two weeks after birth, a girl of Roma origin was transferred from the hospital where she was born to a temporary family. Five days later, in accordance with the decision of the District Family Support Centre, the minor was transferred to a foster family. After returning home, the foster parents noticed skin discolourations in the intergluteal cleft and on the lower back while changing the child's clothes, resembling bruises. The County Family Support Centre was then informed, and they advised taking the child to the hospital for an examination. The doctor examining the child at the hospital noted bruising in the sacral area. The child remained calm during the exam-

ination. The physical examination did not reveal any pain during palpation of the abdomen, limbs, head and torso. No other injuries were found. Furthermore, the doctor performing the examination did not have access to the child's previous medical records. Based on the results of the examination, a report of a suspected crime was filed with the prosecutor's office, which then initiated an investigation. A forensic medicine expert was appointed to prepare an opinion on the bruises found. Based on the physical examination conducted three days after the child was transferred to the foster family, the expert observed symmetrical redness, slightly shiny, on both buttocks, without signs of bruising. In addition, the photographic documentation from the day the changes were found by the caregivers was assessed. Irregular, brownish discolourations similar to resorbing bruising were found in the paraspinal area on both sides, as well as non-characteristic discolourations on the buttocks similar to terminal, resorbing bruising. These changes were determined to be difficult to assess based on photographs. On the basis of the physical examination and available evidence, the expert concluded that the injuries impaired bodily function for less than seven days within the meaning of the Polish Penal Code. Furthermore, the injuries could have been caused by a passive or active mechanism, resulting from contact with a hard, blunt instrument, such as a hand or a hard surface. During the investigation, the foster parents were questioned and they indicated that such changes in the sacral area were already present during the

child's stay at the hospital. Additionally, the temporary mother, who had previously cared for Roma children, noted that such changes often occur in this group and that they could be 'Mongolian spots'. A team of experts was appointed to re-evaluate the changes occurring in the minor. The team included specialists in forensic medicine, pathology and dermatology. During the examination, the foster parents mentioned that they had noticed spots on the child's skin in the lumbar and buttock areas on the day the child was transferred to their care. Furthermore, according to the parents, the size and shape of the spots on the skin had not changed, only the intensity of their colour had altered, becoming paler. Apart from that, the child was developing normally and was vaccinated according to the vaccination schedule. During the physical examination, two pale blue spots were found on the skin in the lumbar area, measuring 2.5 cm in diameter on the left side and 3 cm on the right side. In addition, a spot was found of about 8 cm in diameter, pale blue in colour, covering the upper part of the buttocks and the intergluteal cleft (figures 1 and 2). After prior disinfection, the spots were assessed using a Heine DeltaOne dermatoscope in normal lighting mode and in polarized light, revealing no signs of injury (figure 3). Based on the above assessment, it was determined that the changes visible on the child's body are not traumatic in nature and constitute natural skin discolouration – a congenital form of a melanocytic nevus of the Mongolian spot type.



Figures 1 and 2. Lesions in the lumbar region of the examined minor

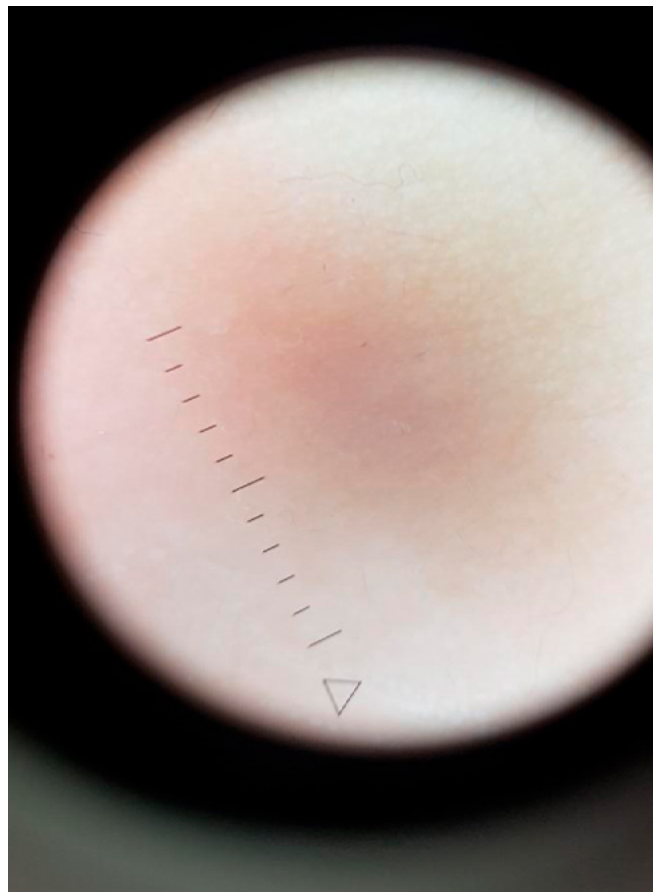


Figure 3. *Dermatoscopic image of the change*

Discussion

Congenital dermal melanocytosis occurs with similar frequency in both sexes. In most cases, the lesions appear shortly after birth or soon thereafter. They usually disappear by the age of one, although in a small number of cases they may persist into middle age [16]. However, the frequency of this feature is mainly influenced by the ethnicity of the population, as naevi are most frequently observed in individuals of Asian and African descent [17]. Various studies have noted similar prevalence rates depending on ethnic origin, which can be presented as follows: 81%-100% in the Asian population, 95.5%-96% in the African American population, 46.4%-70.1% in the Hispanic population, and 9.6% in the Caucasian population [14,17,18]. Congenital melanocytosis is an abnormal accumulation of melanocytes in the skin. Melanocytes originate from melanoblasts, which arise from neural crest cells and migrate between the mesodermal and ectodermal layers until they reach the basal layer of the epidermis [19,20]. Clinically, the nevus presents as single or multiple spots located on the lower back, sacrum, or buttocks. These lesions can range in colour from dark grey to blue-green and have a variety of shapes, such as round, oval, or irregular [21]. The vast majority of cases of con-

genital cutaneous melanocytosis occur on less than 5% of the body surface area. Atypical lesions, also referred to as extrasacral naevi, may occur in various body areas, such as the legs, arms, groin, shoulders, and chest [22]. Although congenital cutaneous melanocytosis is traditionally considered a benign lesion, there is a certain risk of coexistence with certain metabolic defects, such as Hurler's disease, GM1 gangliosidosis, Hunter syndrome, and Niemann-Pick disease. Lesions coexisting with congenital metabolic defects show a tendency for atypical areas [22,23]. Regression of lesions in congenital cutaneous melanocytosis is a phenomenon not seen in other melanocytic naevi. Melanocytes in the skin are surrounded by a protective extracellular sheath. Electron microscopic studies have shown that naevi gradually lose this sheath and are destroyed. The process of melanocyte destruction begins in utero and intensifies in the first years of life [24]. Ink spot diagnosis is usually based on clinical observation, with no need for additional laboratory or imaging tests. However, differential diagnosis should include other melanocytic naevi [25]. First of all, nevus of Ota, most often located unilaterally, may involve the face and eye socket [24], whereas nevus of Ito, blue or brown spots affecting the neck, supraclavicular region and nape. In differential diagnosis, attention should also be paid to blue nevus and cavernous hemangioma [26]. Special consideration should be given to nonaccidental trauma when lesions occur in atypical locations, they are painful to the touch or when there is a large number of spots at different stages of the healing process [27]. Treatment of ink spots is usually unnecessary, as these lesions disappear spontaneously within a few years of life. If there are concerns, consulting a dermatologist is advisable. There are also methods of spot removal using laser therapy or cryotherapy, but it is important to remember that these procedures may carry a risk of complications [28].

Table 1. *Differential diagnosis of the so-called Mongolian spot and the bruise*

MONGOLIAN SPOT	BRUISE
Grey, bluish	Cherry, purple, brown, yellowish
Consistent, usually uniform colouration	Colour changing over time, non-uniform
No redness of the surrounding tissues	Possible redness of the surrounding tissues
Painless upon examination	Child's anxiety or crying upon touch, tenderness
Consistent location	Variable location over time
Lower back, buttocks, sacrococcygeal area	Any location
Usually up to 1 year of age	Any age

In forensic medicine, assessing skin lesions that may mimic injuries, such as bruises or ecchymoses, may pose significant diagnostic difficulties due to their morphological similarity [7,27]. The distinction between a bruise and a Mongolian spot should be based on a thorough examination of the suspicious lesion, with particular attention paid to its location and colour (table 1).

In the case of a Mongolian spot, its colour will range from bluish-grey to slate, while a bruise, depending on the resorption phase, may range from cherry red through purple, brown, greenish to yellow [29–32]. The structure of the colour is also important. In the case of Mongolian spots it will usually be uniform, while the colour of the bruise may be non-uniform. Additionally, Mongolian spots are usually located in the lumbar, sacrococcygeal and gluteal areas. Therefore, each change in this area requires special attention [33–36]. Bruises, however, can occur all over the body. The child's behaviour during the examination should also be observed. Anxiety or crying when the lesion is touched may indicate pain characteristic of traumatic changes. Furthermore, an important criterion for distinguishing a Mongolian spot from a bruise is the evolution of the lesion over time. In the case of Mongolian spots, their location remains constant, and the colour may fade over time. This usually happens within weeks or months after birth [37]. Bruises exhibit much more dynamic changes and in the case of children, they heal faster, significantly limiting the possibility of determining the time of their formation, both through physical examination and photographic analysis [38–42].

Depending on their size and saturation, a clear change in colour and size occurs within a few days. Furthermore, in conditions of constant violence, some bruises may heal, and subsequent physical injuries may cause new bruises to appear in different locations. Therefore, it is crucial to provide the most accurate possible description of the location and dimensions of the lesion, so that the evolution of the lesion over time can be assessed. In cases where doubts arise during the initial assessment, it is possible to postpone issuing an opinion until the next examination [7]. The second examination should be performed within approximately 7–14 days from the first assessment, depending on the intensity of the changes. During re-examination, if there is a significant reduction in the lesion, a change in colour or location, it will be possible to exclude a Mongolian spot. Additionally, the analysis of medical records plays an important role in the assessment of Mongolian spots. Finding mentions of areas of bruising in the locations covered by the examination indicates a long-term occurrence of the lesion in the past, which is one of the characteristic features of Mongolian spots in children. If there are further doubts, the assessment of the changes should be performed by a dermatologist and supplemented with a dermatoscopic examination. Due to its invasive nature and possible aesthetic burden due to scarring, histopathological examination of a sample taken from the lesion should be considered the final diagnos-

tic step and performed only in cases raising justified doubts. In the discussed case, the assessment of the change based on the examination and photos taken three days earlier is too short a time period to sufficiently assess the evolution of the change. Furthermore, the analysis of photographic documentation itself may present significant diagnostic difficulties due to possible disturbances in the colour balance of the evidence material, the lack of a ruler for scale, and different positions of the child. In cases of assessing changes that may mimic bruises in the context of violence against children, their forensic-medical assessment should be performed with particular caution. Overdiagnosis can lead to a child being taken away from the guardians or even temporary arrest, causing trauma for both the child and the guardians. Underdiagnosis, on the other hand, prolongs the period of the child's exposure to violence, which, especially in the case of infants, may threaten their health and life.

Conclusions

The assessment of changes morphologically resembling bruises on the child's skin requires special attention. Certain pigmented or pathological changes may mimic bruises or ecchymoses resulting from trauma, raising suspicions of child abuse. Determining the circumstances of such changes or discolourations, due to the related legal consequences, always requires particular caution in the opinion process. In cases that raise doubts, it is necessary to withhold the opinion and reassess the change after some time. If uncertainties cannot be resolved at a given stage of the opinion, the medical documentation should be analysed and a dermatologist should be included in the opinion-giving team. Furthermore, considering the current geopolitical situation and the increased phenomenon of migration, which involves the transfer of people from different ethnic groups, the frequency of previously rare dermatoses may be affected. Therefore, it is essential to properly prepare doctors to recognise these conditions and include them in the differential diagnosis of non-accidental injuries.

All authors declare that they have no conflicts of interest.

We confirm that this work is original and has not been published elsewhere in full version, nor is it currently under consideration for publication elsewhere. This is the full version of the research presented during the Casus 2024 congress, Kraków.

All authors approved the manuscript and its submission to the journal.

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Corresponding author:

lek. Szymon Rzepczyk

Department of Forensic Medicine, Poznan University
of Medical Sciences,

Rokietnicka 10, 60-806 Poznań, Poland

e-mail: szymon.rzepczyk@interia.eu

ORCID:

Szymon Rzepczyk – 0000-0001-6330-1511

Paweł Świdorski – 0000-0002-8518-8625

Ryszard Żaba – 0000-0003-0756-3909

Czesław Żaba – 0000-0001-7522-4568