



Case report

Breaking Capillaries: an Unusual Rash in Human Metapneumovirus Infection

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KEYWORDS

Human metapneumovirus (hMPV), Rumpel-Leede phenomenon, petechiae, viral exanthem, capillary fragility, pediatric dermatology, differential diagnosis

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ABSTRACT

Human metapneumovirus (hMPV), an established cause of bronchiolitis in infants, has not been previously associated with significant cutaneous findings. We describe a case of an infant with hMPV infection who presented with a cephalocaudal rash and petechiae. Dermatologic evaluation revealed signs consistent with the Rumpel-Leede phenomenon. This case highlights the importance of recognizing pressure-induced purpura in the context of viral illness. Recognition of this benign pressure induced purpura will avoid unnecessary workup and isolation precautions.

1. Background

Human metapneumovirus (hMPV) is a leading cause of acute lower respiratory tract infections in young children, often presenting with symptoms similar to respiratory syncytial virus (RSV) (1). While its respiratory profile is well-documented, cutaneous manifestations are uncommon and poorly characterized in the literature. The Rumpel-Leede phenomenon, characterized by capillary rupture distal to venous compression, has been reported in scarlet fever, thrombocytopenia, diabetes mellitus, and occasionally during viral infections (2.) Scarlet fever, toxin-driven inflammation

and mechanical compression may lower the capillary integrity threshold, facilitating rupture and petechiae in susceptible patients. Viral infections drive complex pathophysiology involving endothelial dysfunction, cytokine-mediated vascular leak, coagulation imbalance, and sometimes lasting microvascular changes. These mechanisms interact to cause manifestations ranging from petechiae and edema to thrombosis or hemorrhage. Awareness of this benign clinical sign is crucial to distinguish it from more ominous presentations such as vasculitis or meningococemia (3.).

2. Case Presentation

Human metapneumovirus (hMPV) is a well-recognized etiology of bronchiolitis in infants but is not commonly associated with distinctive cutaneous manifestations. We report a case in which hMPV infection was complicated by a rash that mimicked exanthematous illnesses, leading to an extensive diagnostic evaluation. Careful morphologic analysis ultimately revealed findings consistent with the Rumpel-Leede phenomenon (2).

A previously healthy male infant presented with acute onset of cough, nasal congestion, and wheezing. Parents noted the development of a rash beginning in the postauricular region and spreading to the face, trunk, and upper extremities within hours. There was no conjunctivitis, Koplik spots, mucosal involvement, or fever exceeding 38 °C. His past medical history was notable only for mild eczema. Family history included recent group A *Streptococcus* pharyngitis in both parents. The patient's vital signs demonstrated tachypnea, tachycardia, and hypoxemia, requiring brief low-flow oxygen support.

On dermatologic examination, the child exhibited a diffuse, erythematous, fine-textured maculopapular eruption over the face and upper trunk. Superimposed petechial patches were observed on the upper extremities. Notably, following tourniquet application for

intravenous placement, a sharply demarcated band of non-blanching petechiae developed distal to the compression site. Lesions were asymptomatic, spared the mucous membranes, and were confined to areas of increased venous pressure. Laboratory testing revealed a normal platelet count and coagulation profile. These findings were characteristic of the Rumpel-Leede phenomenon (tourniquet test positive), indicating capillary fragility rather than a systemic vasculitic or thrombocytopenic process (2).

Because the eruption's initial distribution suggested a cephalocaudal viral exanthem and occurred during an active measles outbreak, airborne isolation was instituted, and measles PCR and IgM testing were performed. Both were negative. A viral respiratory panel confirmed hMPV, and a rapid antigen test for Group A *Streptococcus* was positive. Although throat PCR was positive for Group A streptococcus, to our knowledge there is no reports in the medical literature to support a causative relationship between streptococcus pyogenes infection and the Rumpel-Leede phenomenon in absence of a strawberry tongue, scarletiform "sand paper" rash. The patient's rash remained stable, and petechiae resolved gradually without intervention. He was discharged home with amoxicillin and improved condition, with outpatient follow-up arranged.

3. Discussion

This is the first reported case of capillary fragility associated with hMPV infection. This patient's petechial eruption following tourniquet application, combined with a normal coagulation profile, supports a diagnosis of the Rumpel-Leede phenomenon (2). The Rumpel-Leede phenomenon is typically described in thrombocytopenic states, poorly controlled diabetes, or after mechanical stress, yet it can appear in otherwise healthy children during acute viral illnesses. Physi-

cians should be aware of this presentation, particularly in pediatric patients, as its morphologic features—non-blanching petechiae in pressure-dependent distributions—distinguish it from morbilliform exanthems, toxin-mediated eruptions such as scarlet fever, and petechial rashes that suggest life-threatening infections (3, 4). Prompt recognition can prevent unnecessary hematologic investigations, empiric antibiotic therapy, and prolonged isolation precautions.

4. Conclusion

This is the first case to highlight the novel association between human metapneumovirus (hMPV) infection and the Rumpel-Leede phenomenon in an otherwise healthy infant. Recognition of this benign, pressure-induced purpura is essential in distinguishing it from more serious etiologies such as vasculitis, thrombocytopenia, or meningococemia—particularly

in the context of febrile viral illnesses. Awareness of this phenomenon can significantly impact a clinician's approach to care. Our findings expand the spectrum of cutaneous manifestations associated with hMPV and underscore the importance of careful dermatologic examination in the pediatric setting (Fig.1) (4, 5).



Fig. 1. *Confluent, non-blanching petechiae coalescing into a vio-laceous patch, distributed circumferentially on the distal upper ex-tremity. The rash is sharply demarcated at the proximal margin, with sparing of the skin proximal to the compression site.*

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