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Case Report

Hand Foot and Mouth Disease – A Case Report and Review of Literature

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Abstract

Hand, foot, and mouth disease (HFMD) is a quotidian viral illness affecting primarily infants and children but can sometimes affect adults too. As the name propounds, the infection usually involves the hands, feet, and mouth, although may, sometimes, involve the genitals and buttocks. The genesis of HFMD is coxsackievirus A type 16 in most cases, but other strains of coxsackieviruses and Enteroviruses can also be the culprits. The coxsackievirus is a member of the *Picornaviridae* family, which includes non-enveloped single-stranded RNA viruses. This article aims to review the pathophysiology and clinical presentation of HFMD by discussing a case and will aim to highlight the role of the dental clinicians in diagnosis and management of this disease entity.

Key words: Coxsackievirus, Enteroviruses, Hand, foot, and mouth disease, *Picornaviridae*

INTRODUCTION

Hand, foot, and mouth disease (HFMD) is a common disease encountered usually in childhood and is characterized by a brief febrile illness, archetypal vesicular rashes on the palms, soles, or buttocks, and oropharyngeal ulcers. Occasionally, patients may also develop neurological complications, such as encephalomyelitis, aseptic meningitis, and acute flaccid paralysis. The most common etiological culprits are coxsackievirus A6, A16, and *Enterovirus* type 71.[1,2] Here, we report and discuss a case in a year male child who presented with typical features of HFMD.

CASE REPORT

A 4-year-old male patient reported to the outpatient department with chief complaints of difficulty in eating since a day and history of fever since 2 days. The patient was apparently alright 2 days back, when he suddenly developed a fever overnight. There were no prodromal symptoms of flu as such and the fever was of high grade associated with malaise and lethargy in general. The child was administered with plain paracetamol for his fever which eventually subsided. The following day, his mother noticed multiple papules over the palm and foot. Following that he rapidly developed a severe ache in both legs and was unable to eat. The eruptions were associated with severe itching over the papules.

After obtaining a proper informed consent from the parent as part of the routine protocol before the clinical examination, the patient was carefully examined. The child on inspection looked sluggish and overall lethargic and irritable. On palpation, the patient was febrile and a digital thermometer was used to check the temperature which was high at 101.4°F at the time of presentation. Multiple papules were noted on the palm [Figure 1] and foot [Figure 2]. On intraoral examination, multiple reddish macules, measuring approximately 2 mm in diameter, were apparent in the roof of the hard palate (in rugae area and along the junction of hard and soft palate) [Figure 3]. No other lesions were present intraorally. Based on the clinical presentation, the case was diagnosed as hand, foot and mouth disease. The patient's parent was advised to give him plenty of fluids, along with a prescription of paracetamol syrup for fever besides topical local

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Figure 1: Photograph showing numerous papules on palm

Figure 2: Photograph showing numerous papules on foot

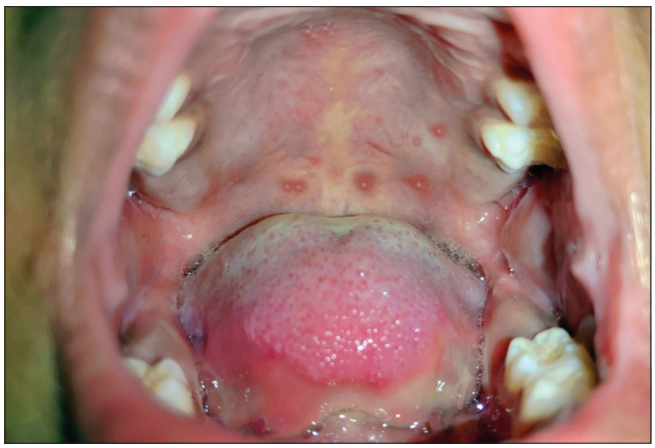

Figure 3: Photograph showing numerous macules scattered over hard palate

anesthetic for intraoral application, antihistamine syrup to reduce itching, and calamine lotion for topical application on the lesions. The parents were asked to come for follow-up after 2 days. After 2 days, most of the papules had turned into fluid-filled blisters and few blisters were present around the mouth. The palatal lesions had considerably subsided, thus improving the patient's ability to consume food. The vesicles showed crustations in a week's time and the skin eventually returned to normal in a month. The patient was followed up for 6 months without any recurrence till date.

DISCUSSION

First reported in New Zealand in 1957, HFMD is a routinely confronted, for the most part a mild, childhood illness caused by Enteroviruses. It is a viral exanthem, and it is most commonly caused by the coxsackievirus of the *Enterovirus* family. Coxsackievirus A16 and *Enterovirus* A71 are the serotypes most commonly implicated as causative agents.[3-5] The past 5 years, coxsackievirus A6 has been identified as a causative agent in outbreaks in Europe, South-East Asia, and America.[6] Coxsackievirus A16 was first identified in 1958 in Canada. HFMD has been considered to be a benign disease of self-limiting nature.[7] Although not indigenous to one area in particular, it occurs worldwide. As children (particularly those younger than 7 years of age) are more vulnerable, they tend to be infected at a higher rate than adults. Ergo, outbreaks are more frequently seen in day-cares, summer camps, or within the family. Inputs from Large-scale surveillance in China have clearly demonstrated that more than 90% of HFMD cases occurred in children <5 years of age with a mortality of around 0.03%. It was also concluded that cases tended to occur more frequently during late spring and early summer.[8] Another study from Vietnam reported a positive interdependency between an increase in environmental temperature and humidity and an increase in the incidence of HFMD.[9]

In 2021, a French surveillance found a meteoric increase in HFMD cases, with more than 3400 cases being officially reported. More than 90% of sequenced cases were found to be linked to *Enterovirus,* while few atypical cases were found to be associated with Coxsackievirus A6 and A16.[10] In United States, Coxsackievirus A6 remains the dominant cause of HFMD[11] till date.

The spread of the human *Enterovirus* is conciliated by oral ingestion of the shed virus from the gastrointestinal or upper respiratory tract of infected hosts or through vesicle fluid or oral secretions.[12] The patients tend to be most infectious in the 1st week of the disease, with an incubation period ranging between 3 and 6 days.[12] Post ingestion, the virus replicates primarily in the lymphoid tissue of the lower intestine and the pharynx and fan out to the regional lymph nodes. This can later extend to multiple organs, including the central nervous system (CNS), heart, liver, and skin.

HFMD can initiate with a low-grade fever, loss or reduced appetite, and general malaise. The quintessential presenting symptom is usually mouth or throat pain secondary to the exanthem which can be macular, papular, or vesicular. The lesions are about 2–6 mm in size, are non-pruritic, and are typically not painful. They last on an average of 10 days, tend to rupture, and result in painless and shallow ulcers that do not leave a scar. The dorsum of the hand, feet, buttocks, legs, and arms can also be involved. The vesicles are surrounded by a thin halo of erythema, eventually rupturing and forming superficial ulcers with a gray-yellow base and an erythematous rim. Oral lesions commonly involve buccal and tongue ulcers but may also strike the soft palate.[12]

On rare occasions, HFMD has presented with atypical features like concomitant aseptic meningitis. *Enterovirus* infections that cause HFMD are notorious for involving the CNS and may cause encephalitis, polio-like syndrome, acute transverse myelitis, Guillain-Barre syndrome, benign intracranial hypertension, and acute cerebellar ataxia.[12]

The diagnosis of HFMD is usually made clinically. The virus can be detected in the stool for about 6 weeks after infection; however, shedding from the oropharynx is generally <4 weeks. Light microscopy of biopsies or scrapings of vesicles will differentiate HFMD from varicella-zoster virus and herpes simplex virus. While serology is not sensitive to making a diagnosis of HFMD, levels of IgG can be used to monitor recovery. Some centers use serological methods are to differentiate *Enterovirus* 71 from coxsackievirus, due to its prognostic magnitude. Latterly, polymerase chain reaction assays are also available in many centers to confirm the diagnosis of coxsackievirus. A swab of the lesion can detect coxsackievirus or *Enterovirus* using real-time PCR assays.[11,13]

HFMD is a relatively mild clinical syndrome and usually resolves within 7–10 days. The treatment is fundamentally symptomatic and supportive. Pain and fever can be easily managed with NSAIDs and acetaminophen. Making sure the patient remains well-hydrated is of paramount importance. In addition, a mixture of liquid ibuprofen and liquid diphenhydramine can be used to gargle, which helps coat the ulcers, easing the pain.[14,15] Steroids are useless as they were found to increase the risk of severe HFMD.[16]

In recent times, researchers have developed specific treatments to manage *Enterovirus* induced HFMD due to its severe neurological complications. Hitherto, no drug has been approved, but promising novel agents include molecular decoys, translation inhibitors, receptor antagonists, and replication inhibitors. An antiviral agent that has shown promising results in the treatment of *Enterovirus* is pleconaril, an anti-picornaviral agent. However, currently, there are no approved antivirals for the treatment of HFMD.[17] Anecdotal reports have shown some clinical response to acyclovir, but large-scale trials have not established this.[18]

Numerous vaccines have been developed against HFMD and enteroviruses. Lately, strain-specific inactivated whole-virus aluminium-adjuvant vaccines have been evolved in China and are approved for widespread use.[8] In a study with 10,077 participants, a three-dose regimen of the EV71 C4a vaccine showed an overall efficacy of 94.7% (95% CI 87.8–97.6), with protection lasting for around 2 years.[19] Virus-like particles vaccines, DNA vaccines, peptide vaccines, and subunit vaccines have been developed but are in various stages of clinical trials.[20]

CONCLUSION

It is not new information that there is a remarkable link between one's oral health and overall health. Ergo, it is paramount the, dental surgeons must be aware of the correlations, assess patients for risk factors, and encourage patients to follow-up with their physician for age-appropriate screenings. Numerous systemic conditions, including some autoimmune, hematologic, endocrine, and neoplastic diseases as well as chronic illnesses, cause pathognomonic changes in the oral cavity. Dental practitioners play a key role in preventive medicine as they work with their medical cohorts to identify systemic diseases. Together, the medical and dental homes are integral to a superior and an acceptable patient health.

HFMD, that was once considered a disease of cattle, has been emerging as a common human childhood disease in the past few years. Although in most of the cases, it is nonfatal, there are some reported cases of complications seen in HFMD patients. Therefore, all dentists, pediatricians, and dermatologists should be aware of the clinical features of this disease and its possible complications so that it can be dealt with caution.

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