CASE REPORT

MUMPS MYOCARDITIS: A FORGOTTEN DISEASE?

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Mumps is an acute viral illness that follows a self-limiting course but up to 10% of cases have a complicated course with the involvement of other organ systems. Myocarditis is reported as a complication but the incidence has greatly fallen ever since the development of the mumps vaccine. A child presented to our department with parotid swelling and fever. Persistent tachycardia with irregular pulse led to further cardiac work up which showed decreased ejection fraction and raised serum cardiac enzymes, indicating myocardial damage. With ionotropic agents and supportive care, there was complete normalization of ejection fraction and serum cardiac enzyme levels. He was discharged within a week of admission. This case highlights the importance of suspecting myocarditis in the setting of mumps, a diagnosis that precludes early suspicion in mumps patients suffering from cardiac symptoms not explained by other potential aetiologies. Early suspicion and timely supportive care are essential to ensure favourable outcomes.

Keywords: Mumps, Myocarditis, Parotitis, Viral Parotitis

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INTRODUCTION

Mumps is an acute viral illness caused by the mumps virus, which belongs to the *Paramyxoviridae* family of viruses.[1] It is predominantly a disease of childhood, typically characterized by painful swelling of the parotid gland in majority of cases, accompanied by fever, malaise and anorexia.[1,2]

Mumps is known to follow a self-limiting course and is known to be a benign disease when compared with other vaccine-preventable diseases such as measles, pertussis etc.[1–3] Nevertheless, the burden of the disease should not be underestimated, as up to 10% of the diseases are reported to run a complicated course because of the involvement various organ systems, some of which include, but are not limited to, aseptic meningoencephalitis, pancreatitis, sensorineural hearing loss, orchitis (males) and oophoritis (females).[1,3–5]

Myocarditis, however, is a rare complication of this viral illness[6–11], first reported by Pujol *et al*[11] in 1918. The incidence of myocarditis as a complication of mumps was reported to be as high as 15% in all cases in literature up until the mid-1950s.[6,10]

With the introduction of the mumps vaccine in the childhood vaccination schedules of numerous countries in 1998, there has been a rapid decline in the incidence of the disease;[1] consequently, the incidence of myocarditis has fallen to as low as 4%. In some regions, the complications of mumps, such as myocarditis, have almost completely vanished ever since.[1,3] We report the case of an 8 year old child who presented with typical findings of mumps parotitis along with myocardial involvement.

CASE REPORT

An 8 year old boy presented to our emergency room with a 3 day history of fever, abdominal pain, bilateral cheek swelling and generalized body aches and stiffness. He also had a one day history of up rolling of eyes with jerky movements, most likely suggesting seizures. Upon further inquiry, the child had been diagnosed with mumps two days ago on clinical grounds by a local paediatrician. Birth and developmental histories were unremarkable. The child had been vaccinated under the Expanded Program on Immunization (EPI) schedule in Pakistan, but had not received the measles, mumps, and rubella (MMR) vaccine, since it was not included in the EPI schedule. Family history was significant for diabetes mellitus; otherwise no one in the family was experiencing similar complaints. The local paediatrician prescribed acetaminophen for symptomatic relief; however, his symptoms were not improving.

Physical examination revealed a drowsy, sick looking child with a Glasgow Coma Scale (GCS) score of 9/15. There was painful swelling over the parotid region bilaterally with enlarged submandibular lymph nodes. Peripheral pulses were weak with an irregular heart rate, reaching to a maximum of 149 beats/minute and blood pressure of 92/60 mmHg. Motor system examination showed increased muscle tone with decreased power (2/5) and positive Babinski sign.

A provisional diagnosis of mumps complicated with encephalitis was made. Noteworthy differentials at the time were bacterial meningitis and hyponatremic encephalopathy. The patient was shifted to the intensive care unit and was started on

intravenous (IV) fluids and empiric ceftriaxone and vancomycin to cover bacterial meningitis. Complete blood counts showed leukocytosis with neutrophilia and lymphopenia. Other blood tests showed marked hyponatremia and hypokalaemia (126 and 3.0 mEq/L, respectively). Lumbar puncture was unremarkable for any cerebrospinal fluid (CSF) abnormalities suggestive of meningitis, hence antibiotics were discontinued. An electroencephalogram was ordered which revealed theta and delta slowing with prominent sleep activity in the absence of any definitive epileptic activity. Phenobarbital was given as seizure prophylaxis. The electrolyte imbalance was managed with hypertonic saline which eventually resulted in clinical improvement and a rise in the GCS score to 15/15 within the next 72 hours.

However, irregular pulse with tachycardia persisted despite active medical management and improvement. A cardiology consultation was sought, who advised to get an echocardiogram, electrocardiogram (ECG) and cardiac enzymes. Echocardiogram revealed dilated left sided cardiac chambers with grade 1 mild diastolic dysfunction and atypical movement of the interventricular septum was noted. Ejection fraction was noted to be low (35%). Creatine kinase MB and troponin I were both elevated (43.50 and 2.62 ng/ml, respectively) indicative of myocardial damage, however, an ECG done at that time did not show any findings consistent with myocardial ischemia. A clinical diagnosis of myocarditis secondary to mumps was made.

The child was started on inotropic support with dopamine, dobutamine and digoxin. Enalipril, spironolactone, L-carnitine and methylprednisolone were also added and seizure prophylaxis was continued. An order was placed for mumps immunoglobulin from the National Institute of Health, Islamabad. Unfortunately due to non-availability, we were not able to obtain the immunoglobulin to add to the patient's therapy.

The child's overall condition began to improve, however, tachycardia persisted. A repeat ECG was done, which indicated non-specific anterolateral T wave changes suggestive of left ventricular hypertrophy.

Over the course of next few days, continued use of medicines led to further improvement of symptoms. All serum electrolytes normalized, except for mild hyponatremia (134 mEq/L). Tachycardia resolved with the appearance of normal sinus rhythm. The child was active, asymptomatic and GCS remained stable at 15/15.

A repeat echocardiogram showed significant improvement in cardiac function with an ejection fraction of 66% and no evidence of diastolic dysfunction and cardiac enzyme levels had normalized. Inotropic support was eventually discontinued. In light of marked clinical improvement, the child was discharged on the 7th day of his admission. Mild hyponatremia persisted and the child was advised to increase salt in the diet and regular outpatient follow up.

DISCUSSION

Mumps is an acute viral illness of childhood, characterized by painful swelling of the parotid gland accompanied with fever, malaise and anorexia.[1,2] It follows a relatively benign and self-limiting course in comparison to other vaccine-preventable diseases such as measles, pertussis etc.[1–3] but up to 10% of cases have a complicated course with the involvement of other organs such as the central nervous system (CNS), pancreas etc.[4] Up until the mid-1950s, myocarditis was reported as a complication in up to 15% of cases,[6,10] but ever since the incorporation of the mumps vaccine in immunization schedules, the incidence has fallen to as low as 4%, an even completely disappeared in some regions.[1,3]

Our patient presented with a history of pain, parotid swelling with fever and malaise; a very typical presentation of mumps. The neurological symptoms pointed towards CNS involvement and possible viral encephalitis secondary to mumps, which was ruled out by unremarkable CSF analysis. Other blood work showed remarkable hyponatremia, which could have been the most probable cause of the patient's neurological symptoms.

With improvement in GCS score and resolution of neurological symptoms, the persistence of irregular pulse with tachycardia led us to suspect an underlying cardiac pathology. Low ejection fraction on echocardiogram and elevated cardiac enzymes pointed towards myocardial damage and compromise; though an ECG done at the time was inconclusive and did not show any signs of myocardial ischemia. ECG abnormalities have been demonstrated in patients with cardiac involvement as a complication of mumps,[4,6,10,12] ST segment and T waves abnormalities being the most common ECG findings[2]. However, no ECG findings were demonstrated during active cardiac disease in our patient.

Inotropic drugs, steroids and supportive care led to eventual recovery of cardiac function and resulted in a favourable outcome. The use of heart failure medications such as diuretics, angiotensin converting enzyme-inhibitors and β-blockers are the mainstay of treatment of viral myocarditis. Patients who have compromised left ventricular function require ionotropic support for symptomatic relief.[13–15]

Upon improvement in left ventricular function, therapy can be discontinued, with several studies showing favourable outcomes. Ionotropic agents and supportive care can also be used as a bridge to heart transplantation in the case of those patients who have irreversibly compromised cardiac function.[13–15] It is important to recognize this complication early in order to prevent development of any myocardial residua. The damage is completely reversible in most cases; though it may be prolonged and recovery might be delayed if the problem is not recognized early.[4,7]

Though the cardiac dysfunction is transient in most cases, there have been cases in which mumps myocarditis has resulted in a fatal outcome,[8,9,16,17] highlighting the potentially deadly nature of this complication. Rosenberg *et al*[10, 12] have emphasized upon the fact that mumps myocarditis is probably not rare and thereby merits the need for further study. The potential involvement of several organ systems by the disease suggests that mumps is a generalized viral process and that many organ systems, including the cardiovascular system, may be affected by the acute infectious process; such involvement may remain subclinical or may develop clinically significant signs and symptoms and may occur with unpredictable frequency, depending on varying severity from patient to patient. Review of literature suggests that mumps myocarditis frequently goes unrecognized and usually manifests in a subclinical form.[1,3,4,7] As previously discussed, a considerable number of mumps myocarditis cases were reported up until the mid-1950s, but over the years there has been a gradual decline in reports of this complication of mumps. To the best of our knowledge, there have been no cases reported during the 21st century.

To conclude, though there has been a great fall in the incidence of myocarditis secondary to mumps in the recent decades, it is a noteworthy complication of mumps. This case highlights the importance of suspecting myocarditis in the setting of mumps, a diagnosis that precludes early suspicion in mumps patients suffering from cardiac symptoms not explained by other potential aetiologies. Detailed cardiac evaluations, including echocardiogram and serum cardiac enzyme levels, need to be performed as ECG abnormalities may not be demonstrated in some cases. Early suspicion and supportive care are essential to ensure a favourable outcome in paediatric patients who suffer from this apparently 'forgotten' complication of mumps.

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