



## Acute Pancreatitis Caused by Mumps Infection in an Adult

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### Abstract

Mumps is generally a mild childhood disease. However, Mumps virus can infect adults as well and various complications such as orchitis, encephalitis and pancreatitis can occur. We present the case of an acute pancreatitis caused by mumps infection in adulthood. A 49-year-old woman developed acute pancreatitis indicated by the elevation of amylase as well as by swelling of the pancreatic head visualized by abdominal computed tomography. Biological diagnosis of mumps infection was made by positive mumps serology (presence of IgG and IgM) indicating recent contact with Mumps virus. Thus, mumps infection should be considered a possible though rare cause of acute pancreatitis in adulthood.

**Keywords:** Acute pancreatitis; Laboratory diagnosis; Mumps infection

### Introduction

Acute pancreatitis is associated commonly with alcohol abuse and biliary tract disease [1]. Infectious agents such as parasites, fungi, bacteria and viruses, are also incriminated in 10% of cases of acute pancreatitis [2]. Viral pancreatitis can be caused by common viruses such as Mumps virus, an enveloped RNA virus that belongs to the genus Rubulavirus in the *Paramyxoviridae* family [3]. Mumps is generally a mild childhood disease. However, Mumps virus can infect adults as well, the disease is often mild but various complications such as orchitis, encephalitis and pancreatitis can occur [4]. We report a case of acute pancreatitis associated with mumps infection in an adult.

### Case Presentation

A 49-year-old woman was admitted to the emergency department of our hospital with increasing of epigastric pain, radiating through the back which had developed two days before with vomiting and fever. The patient reported a history of cholecystectomy 6 years ago and denied any alcohol consumption. On admission, physical examination revealed fever (39°C) and abdominal tenderness. Some laboratory investigations were abnormal: white cell blood count was 35800 cells/mm<sup>3</sup> (neutrophils: 95%), Blood glucose was 10.40 mmol/L, serum lipase was 5936 IU/L, serum alanine aminotransferase was 295 IU/L, serum aspartate aminotransferase was 128 IU/L, total bilirubin was 20 mg/L, direct bilirubin was 14 mg/L,  $\gamma$  Gluamyl Transferase was 103 IU/L and C-reactive protein was 336 mg/L. Lipedemic profile and coagulation tests were within normal range.

Abdominal Computed Tomography (CT) revealed peripancreatic inflammatory changes, peripancreatic fat corresponding to stage C of Balthazar Grade and showed normal biliary tree and liver.

She was admitted with a diagnosis of mild acute pancreatitis brought to a typical symptomatology of solar pain and increased lipase and was treated conservatively with analgesia, hydration and fasting. During the follow up, epigastric pain completely resolved on day 3 but the patient complained about pain and swelling on her right parotid gland. A contrast-enhanced CT of the parotid gland was performed and showed an enlargement of the right parotid gland, a diffuse enhancement of glandular parenchyma without abscesses or ductal obstruction. The patient did not declare any past history of mumps, and she did not remember receiving Measles-Mumps-Rubella (MMR) vaccine.

Detection of mumps IgG and IgM antibodies were performed by marketed enzyme immunoassays (NovaLisa<sup>®</sup> Mumps virus, NovaTec<sup>®</sup> Immundiagnostica GmbH, Germany) using the ETI-Max 3000 (Diasorin<sup>®</sup>) automate and according to the manufacturer's recommendations. The result of the mumps serological test was positive for both IgG and IgM antibodies, suggesting

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an acute viral infection. Others serological tests have been requested (Cytomegalovirus, Epstein Bar Virus, Hepatitis B and C, Human Immunodeficiency Virus) and have been revealed negatives. We have concluded that pancreatitis was caused by mumps infection. The patient, with symptomatic treatment, improved clinically and was discharged 15 days after admission with normal biological parameters.

## Discussion

The most common causes of acute pancreatitis, diagnosed as severe epigastric pain and tenderness, are associated with alcohol abuse or biliary tract disease [1]. In 10% of cases, infectious agents such as parasites, fungi, bacteria and viruses are also incriminated [2]. Viral pancreatitis can be caused by common viruses such as Coxsackie virus, Hepatitis B virus, Cytomegalovirus, Epstein-Barr virus, Herpes simplex virus and Mumps virus [3]. We report a case of acute pancreatitis associated with mumps infection in an adult.

The Mumps virus is an enveloped particle containing a non-segmented single stranded RNA, which belongs to the genus Rubulavirus in the *Paramyxoviridae* family. Humans are the only natural host of Mumps virus, which is transmitted via the respiratory route by inhalation or oral contact with infected respiratory droplets or secretions [4]. In the pre-vaccination era, Mumps virus was endemic and the main cause of viral encephalitis in many countries. By 2002, mumps vaccine was included in the routine immunization schedule of 121 countries/territories and the incidence of the disease has dropped tremendously [5]. In France for example, between 1986 and 2012, mumps incidence decreased from 859 cases per 100,000 to 6 cases per 100,000 [6]. However, mumps outbreaks have not been uncommon in young adults with routine mumps vaccination notably in Europe and USA; this is particularly related to a decrease in protective immunity over time [6-8]. On the other hand, in countries where vaccination was not introduced, the incidence of mumps remains high, mostly affecting children aged 5-9 years [5]. In Morocco, the mumps vaccine is not included in the National Immunization Program and unfortunately, we were unable to find official data about mumps infection in our country; some publications on the web reported that dozens of students were infected in 2015 with Mumps virus in the province of Figuig (to the east of Morocco).

The incubation period is 2 to 4 weeks during which the virus proliferates in the upper respiratory tract epithelium. Transient plasma viraemia leads to viral spread into organs (parotids, central nervous system, pancreas, urinary tract and genital organs) [4]. Approximately one-third to one-half of mumps infections are asymptomatic or result in only mild respiratory symptoms [9]. If symptomatic, the disease is characterized by painful swelling of the parotid glands in 95% with complete recovery within a few weeks of symptom [4]. In some cases, mumps infection may cause complications such as testicular inflammation (which may result in infertility), meningitis (in up to 15% of cases), deafness and pancreatitis (in 4% to 8% of cases) [4,9]. In our case, pancreatitis was confirmed by CT and biochemical abnormalities and was the initial sign of mumps infection. Indeed, Mumps virus is the most common virus associated with pancreatitis in adult, and mumps pancreatitis often occurs without parotitis which is not our case [10,11].

The clinical diagnosis of mumps is not difficult based on the presence of parotitis. Nevertheless, laboratory testing is essential for case confirmation in complicated forms or if infection occurs after

vaccination [4]. Diagnosis of mumps infection is classically confirmed by serological methods (seroconversion or a four-fold increase in the antibody titer, or detection of virus-specific IgM antibody 7-10 days after symptom onset) [4,12]. Importantly, in vaccinated individuals, IgG levels are usually already elevated; therefore, seroconversion usually cannot be demonstrated. Furthermore, detection of IgM also presents diagnostic difficulties in vaccinated individuals, as a demonstrable increase in IgM levels following infection is often delayed or altogether absent in such individuals [13,14]. For these reasons, RT-PCR from saliva or blood samples in the first 4 days following clinical onset remains choice method for diagnosing mumps infection [13]. Detection of viral RNA can also be performed in urine or in the cerebrospinal fluid (CSF). For our patient, biological diagnosis of mumps infection was made by positive mumps serology (presence of IgG and IgM) indicating recent contact with Mumps virus. The diagnostic specificity and sensibility are >95 % for the IgM test used, the diagnostic specificity is 87.5 % and the sensibility is >95 % for the IgG test used [15,16].

There is no specific antiviral therapy for mumps. Since the illness is generally benign and self-resolving, treatment is mostly symptomatic and supportive. However, the disease is preventable by vaccine, and mumps vaccination is almost universally used in many countries nowadays. Despite this, mumps outbreaks still occur in the world even in areas with high vaccination rates [7,13]. Most of these cases were in young adults attending colleges or universities. This is explained in several studies by the decrease over time in immune protection generated by mumps vaccine [17]. Given the age of our patient, it is very likely that mumps infection follows the decline of immune response against the Mumps virus. In this context, routine use of a third vaccine dose at 18 years of age, or booster dosing throughout adulthood, may be a strategy to prevent mumps re-emergence and should be assessed in clinical trials. On the other hand, no evidence that the emergence of heterologous virus genotypes contributed to changes in vaccine effectiveness over time [17].

## Conclusion

Viral agents such as mumps should be considered in differential diagnosis of acute pancreatitis after excluding the most common causes regardless of age. Mumps serological tests should be interpreted cautiously especially in immunized individuals and detection of mumps viral RNA in saliva appears as the most suitable test to diagnose mumps infection.

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