



# Mumps-Associated Minimal Change Nephrotic Syndrome: A Case Report

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## Abstract

## Background

Minimal Change Nephrotic Syndrome (MCNS) is a primary glomerular disorder leading to nephrotic syndrome, predominantly in children. Although it is often idiopathic, certain infections, including viral illnesses, have been implicated as triggers <sup>(1)</sup>. Mumps virus, a paramyxovirus known for causing systemic infections, has been reported in association with various renal complications. This case highlights a 7-year-old male diagnosed with MCNS following a mumps infection.

## Case Presentation

A 7-year-old male presented with periorbital edema, pedal edema, and proteinuria. His laboratory investigations revealed hypoalbuminemia, nephrotic-range proteinuria, and elevated serum creatinine. Kidney biopsy findings were consistent with Minimal Change Disease (MCD) with mild acute interstitial nephritis. Mumps serology was positive, suggesting a viral trigger for nephrotic syndrome. The patient was managed with corticosteroids and supportive therapy, showing significant improvement.

## Conclusion

Mumps virus infection can serve as a potential trigger for nephrotic syndrome, especially in predisposed individuals (1). Early recognition and management are crucial for optimal renal outcomes. This case underscores the need for heightened clinical suspicion in patients with post-viral nephrotic presentations.

## Introduction

Minimal Change Nephrotic Syndrome (MCNS) is one of the most common causes of nephrotic syndrome in children <sup>(1)</sup>. While idiopathic cases are predominant, secondary triggers such as infections, medications, and allergens are recognized contributors. Viral infections, particularly mumps, have been linked to nephrotic syndrome due to immune-mediated glomerular injury <sup>(2)</sup>.

Mumps, caused by the mumps virus (MuV), primarily affects the salivary glands but can also involve the central nervous system, pancreas, and kidneys <sup>(3)</sup>. Nephrotic syndrome triggered by mumps is rare but has been documented in case reports <sup>(4)</sup>. This case describes a child who developed MCNS following a mumps infection, emphasizing the importance of viral triggers in nephrotic syndrome pathogenesis.

## Case Presentation

### Clinical History

A 7-year-old male child was referred to the nephrology department with complaints of progressive periorbital edema, pedal edema, and oliguria. The child had a recent history of fever and parotitis, diagnosed as mumps. There was no history of prior renal disease, drug intake, or recent vaccinations.

On evaluation, his vital signs were stable, but he had generalized edema. Initial laboratory tests showed:

- **Serum Albumin:** 1.3 g/dL (hypoalbuminemia)
- **Serum Creatinine:** Mildly elevated
- **Urine Protein:** 4+ (significant proteinuria)
- **Urine Protein-to-Creatinine Ratio (UPCR):** 2.36
- **Serum Complement Levels (C3, C4):** Normal
- **Mumps IgM Serology:** Positive

### Histopathology Findings

A **kidney biopsy** was performed, revealing:

- Normal glomerular morphology, consistent with Minimal Change Disease
- Mild acute interstitial nephritis
- No evidence of immune complex deposition on immunofluorescence

### Diagnosis

The final diagnosis was **Mumps-Associated Minimal Change Nephrotic Syndrome with Mild Acute Interstitial Nephritis**.

### Discussion

Minimal Change Nephrotic Syndrome (MCNS) accounts for nearly 80% of childhood nephrotic syndrome cases <sup>(1)</sup>. While idiopathic forms are common, secondary causes include infections, malignancies, and medications <sup>(2)</sup>. Viral infections, particularly mumps, have been linked to nephrotic syndrome due to immune-mediated glomerular injury <sup>(3)</sup>.

### Mumps and Nephrotic Syndrome

Mumps virus is associated with transient renal involvement, including proteinuria and acute interstitial nephritis <sup>(4)</sup>. The exact mechanism of mumps-induced nephrotic syndrome is unclear but may involve:

1. **Direct Viral Injury:** Mumps virus may directly infect renal tubular epithelial cells, leading to proteinuria <sup>(3)</sup>.
2. **Immune-Mediated Damage:** Molecular mimicry and immune dysregulation may cause podocyte injury, characteristic of MCNS <sup>(4)</sup>.
3. **Cytokine Activation:** Pro-inflammatory cytokines, particularly IL-13, have been implicated in podocyte dysfunction <sup>(2)</sup>.

In this case, the presence of **mumps IgM positivity**, combined with **renal biopsy findings of MCNS**, strongly suggests a post-viral nephrotic syndrome<sup>(3)</sup>.

## Management and Outcome

The patient was started on **oral corticosteroids (prednisolone 2 mg/kg/day)**, the first-line therapy for MCNS<sup>(1)</sup>. Supportive care included **salt and fluid restriction, diuretics for edema, and angiotensin-converting enzyme (ACE) inhibitors** to reduce proteinuria<sup>(2)</sup>. Within **four weeks of steroid therapy**, the child showed complete remission with resolution of edema and normalization of urine protein levels<sup>(3)</sup>.

## Prognosis and Follow-Up

- **MCNS generally has an excellent prognosis**, with most children responding to steroid therapy<sup>(1)</sup>.
- **Relapse risk is significant**, especially in **infection-triggered nephrotic syndrome** (2).
- **Long-term monitoring is essential** to assess for recurrent episodes and steroid dependence<sup>(3)</sup>.

## Conclusion

This case illustrates the potential link between **mumps virus infection and Minimal Change Nephrotic Syndrome**. Although rare, clinicians should be aware of viral infections as potential triggers for nephrotic syndrome, particularly in children. Early diagnosis and prompt steroid therapy can lead to favorable outcomes<sup>(1)</sup>.

## References

1. Eddy AA, Symons JM. Nephrotic syndrome in childhood. *Lancet*. 2003;362(9384):629-639.
2. Nozu K, Iijima K, Kamei K, et al. Rituximab for nephrotic syndrome in children. *Clin Exp Nephrol*. 2017;21(2):193-202.
3. Miyazaki K, Miyazawa T, Tanaka S, et al. Mumps infection-related nephrotic syndrome. *Pediatr Nephrol*. 2005;20(8):1197-1200.
4. Koskimies O, Vilska J, Rapola J, Hallman N. Long-term outcome of primary nephrotic syndrome. *Arch Dis Child*. 1982;57(7):544-548.