Fulminant meningococcal supraglottitis in an immunosuppressed patient

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Introduction: Acute bacterial supraglottitis in adults is a distinct although rare condition that differs aetiologically and clinically from the classic paediatric form of the disease. Only a handful of cases of supraglottitis produced by Neisseria meningitidis have been described in the literature.

Case presentation: Here, we present the first description, to the best of our knowledge, of meningococcal supraglottitis in an immunosuppressed patient, with unique features of rapidly progressive symptoms, septic shock and multiorgan compromise.

Conclusion: In view of the recent reports describing a growing incidence of this condition in adults, increasing awareness about its clinical features, natural history and potential complications is needed to enable early recognition and optimal management of emerging cases.

Keywords: Meningococcal infection; Neisseria meningitidis; supraglottitis.

Case report

A 65-year-old male patient was transferred by ambulance to the emergency department, where he presented with acute deterioration of mental status, type II respiratory failure and signs of upper airway obstruction. The available history indicated that over the preceding 6 h he had developed odynophagia, pyrexia and confusion, before rapidly deteriorating. His past medical history included essential hypertension and end-stage renal failure, for which he had received a renal transplant a decade earlier; he was currently being immunosuppressed with prednisolone, tacrolimus and azathioprine.

A difficult airway plan was devised while initial resuscitation, including administration of broad-spectrum intravenous antibiotics, was commenced. Direct laryngoscopy revealed diffuse swelling of the epiglottis, glossoepiglottic folds and arytenoids. The airway was rapidly secured and, following orotracheal intubation, the patient was easy to ventilate and gas exchange rapidly improved.

Subsequent to the induction of general anaesthesia, the patient developed profound distributive shock and, in spite of adequate fluid resuscitation, a continuous infusion of norepinephrine was required to maintain the target mean arterial pressure. Within hours, the patient developed anuric acute kidney injury and continuous haemodiafiltration was commenced 48 h into admission.

Although clinically there was no major haemorrhage, initial blood results revealed an acute coagulopathy with...
severe thrombocytopenia. There was marked elevation of liver transaminases suggesting acute liver injury.

**Investigations**

After the patient had been stabilized in the intensive care unit, fibre-optic nasoendoscopy confirmed the findings of widespread supraglottic swelling. A computed tomography scan of the head, neck and chest revealed diffuse oedema of the parapharyngeal tissues but without any defined collections and without mediastinal compromise. The admission blood cultures were positive for *N. meningitidis* group W135 but the upper airway swabs did not yield any growth.

**Diagnosis**

**Treatment**

The strain of *Meningococcus* isolated was sensitive to all β-lactam antibiotics, so the initial wide-spectrum antibiotic regime of meropenem and metronidazole was down-scaled to ceftriaxone. In accordance with advice from the Department of Health, the personnel involved in airway management received antibiotic prophylaxis with ciprofloxacin and also the pentavalent meningococcal vaccine.

**Outcome and follow-up**

After 3 days of deep sedation and mechanical ventilation, the patient underwent a trial of extubation, which he rapidly failed due to severe agitation. A repeat computed tomography scan of the head and a spinal tap were performed to investigate potential extension of the infection to the central nervous system, but both yielded unremarkable results. With standard pharmacological management of delirium, the patient improved and was successfully extubated. All manifestations of the septic shock, acute kidney injury and coagulopathy promptly resolved, and the patient was discharged to the ward to complete his recovery and eventually to his home, where he has remained well.

**Discussion**

Acute bacterial supraglottitis remains an elusive diagnosis that requires a high index of suspicion for its recognition. The case we have described is of interest because it represents the first report of supraglottitis in an immunocompromised adult and the first description of a fulminant presentation with septic shock and multiorgan failure.

We hypothesize that the particular severity of the systemic involvement in this case may have been due to the background history of chronic immunosuppressant use. However, susceptibility to *Neisseria* infections has been traditionally linked to dysfunction of the innate immune response rather than to the cell-mediated immune response, which is the target of the azathioprine and tacrolimus that the patient was receiving. Following a consultation with the transplant team, during the patient’s hospital stays these drugs were discontinued and replaced with high-dose steroids in an attempt to optimize the host response against infection.

The main learning point to be drawn from this case by hospital physicians is to maintain a high degree of suspicion for this condition in any patient presenting with systemic inflammation and upper airway symptoms, and to bear in mind that, in the context of immunosuppression, it can assume a more fulminant form affecting distant organ systems (Schwam and Cox, 1999).

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**References**


