CASE REPORT

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Unexpected Death Due to Infectious Mononucleosis

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ABSTRACT: A 14-year-old boy with infectious mononucleosis died unexpectedly in hospital. The most significant finding at autopsy was the presence of marked bilateral tonsillar enlargement with considerable narrowing of the upper airway. There were no other underlying organic diseases that could have caused or contributed to death. Narcotic analgesia had been administered less than 2 h before death and may have contributed to respiratory compromise. The blood morphine level was 0.08 mg/L. Toxicological evaluation of individuals with obstructive lesions of the upper airway may, therefore, be a useful adjunct to the autopsy assessment of such cases as it may reveal factors exacerbating mechanical blockage.

KEYWORDS: forensic science, airway obstruction, infectious mononucleosis, narcotic analgesia, sudden childhood death

Upper airway obstruction in young children is most commonly caused by inhaled foreign bodies, in particular food or toy parts (1,2). Much less commonly compromise of the airway occurs due to an intrinsic abnormality such as micrognathia, tumors, or a lingual thyroglossal duct cyst (3–6). Acquired lesions may also result in significant airway narrowing and often involve an infectious etiology; examples include acute epiglottitis, pharyngitis, or acute inflammation of a lingual tonsil (7). Many of these cases occur in infancy and very early childhood, although food aspiration, so called "cafe-coronary" syndrome, may occur at any age associated with physical and mental impairment (2). Fatal upper airway obstruction due to acute tonsillitis is a very rare event (8). The following case is reported, therefore, to demonstrate an unusual case of fatal upper airway compromise associated with infectious mononucleosis and narcotic analgesia.

Case Report

A previously well 14-year-old boy was admitted to a district hospital with dehydration, fever, and a history of a sore throat for five to six days with difficulty swallowing. His tonsillitis had not been responsive to oral antibiotic therapy. There was no documentation of neurological disturbance. The patient was commenced on intravenous rehydration and was given intravenous antibiotics and prescribed oral paracetamol and either intramuscular or intravenous morphine for pain relief. His blood examination revealed a lymphocytosis (6.77×10^9/L) with atypical lymphocytes suggestive of a viral infection. A subsequent ELISA Epstein-Barr antibody test for lgm and IgG was positive, in keeping with a diagnosis of infectious mononucleosis.

Shortly after midnight he received his first dose of intravenous morphine (10 mg) for pain relief, with good effect. There were no other patients in the hospital ward with him. Subsequently he was noted by staff to be breathing noisily through his mouth. He was last checked at around 0145 and was found unresponsive by nursing staff at 0200, lying on his back not breathing. Resuscitation was unsuccessful. Due to the unexpected nature of the death the case was reported to the State Coroner.

At autopsy the tonsils were markedly enlarged and covered by a purulent exudate. The right tonsil measured 32 by 25 by 15 mm and the left 30 by 20 by 15 mm. There was marked narrowing of the upper airway (Figs. 1 and 2), which only admitted the tip of an index finger into the space between the soft palate and tonsils. There was no significant edema of the uvula or epiglottis, and no peritonsillar abscess formation. Other findings included generalized lymphadenopathy, splenomegaly (824 g), chronic inflammation of the upper airways, mild chronic hepatitis, and marked congestion and edema of the lungs with intra-alveolar hemorrhage. There was no evidence of gastric aspiration or other significant underlying organic illnesses. Histologically the tonsils demonstrated nonspecific follicular hyperplasia.

Toxicological examination of the blood revealed a morphine level of 0.08 mg/L. Vitreous humor electrolyte evaluation was in keeping with normal hydration. Death was, therefore, attributed to upper airway obstruction in a case of infectious mononucleosis due to marked enlargement of the tonsils. The presence of a narcotic analgesic in the blood was thought to have contributed to respiratory compromise.

Discussion

Infectious mononucleosis is an acute viral illness characterized by fever, lymphadenopathy, splenomegaly, hepatitis, and pharyngitis. Although generally a benign condition, a mortality rate of 1 per 3000 affected individuals has been reported (9). Causes of sudden death in infectious mononucleosis include splenic rupture, neurological complications, and upper airway obstruction, with fatal secondary infections and liver failure also occurring (10). In addi-

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FIG. 1—*Anterior view of the dissected upper airway demonstrating significant tonsillar enlargement with marked airway narrowing.*

FIG. 2—*Posterior view of the pharynx with tonsillar enlargement in the absence of significant edema or inflammation of the adjacent pharynx or epiglottis.*

tion, myocarditis, pericarditis, thrombocytopenia purpura, and anemia may occur (11,12).

Splenic rupture in infectious mononucleosis may result from minimal trauma with vomiting, coughing, straining at stool, exercise, and medical examination, all being reported as possible causes (13–15). Neurological complications include meningoencephalitis, cranial neuropathies, and motor paralysis due to Guillain-Barre syndrome (9). While respiratory arrest may be assumed to be due to upper airway obstruction, this may not necessarily be the case, as studies have shown that bulbar paralysis secondary to Guillain-Barre syndrome (infectious polyneuritis) may be more common (11).

Obstruction of the upper airway is a rare cause of death in infectious mononucleosis associated with enlargement of the tonsils and adenoids, with edema of the adjacent uvula and epiglottis and/or peritonsillar abscess formation (11,16–19). In the present case the major finding was of marked enlargement of the tonsils with relatively little swelling of the uvula and epiglottis (Fig. 2). On occasion a pseudomembrane may form that also predisposes to airway occlusion (20). Particularly in young children, complete occlusion may occur at any time if there are clinical signs of significant obstruction (21).

A problem in the assessment of the reported case is in determining the possible role of narcotic analgesia in the terminal episode, as intravenous morphine had been administered less than 2 h before death. Determination of the significance of morphine levels in the blood is difficult as individual response is significantly influenced by prior exposure, and the literature contains a wide range of potentially lethal levels (from 0.01 to 3.0 mg/L) (22). As the nursing staff had noted that the patient had exhibited "noisy breathing" and was then found unresponsive, it appears likely that, however, the sedative and respiratory depressant effects of morphine exacerbated the patient's already potentially compromised upper airway. The documentation of noisy respiration is certainly in keeping with airway narrowing.

This case demonstrates the vulnerability of the upper airway to obstruction with massive tonsilomegaly in infectious mononucleosis. If respiratory arrest has, however, occurred in the absence of occluding tonsils, examination of spinal and cranial motor roots and peripheral nerves for the characteristic features of Guillain-Barre syndrome may be useful. Specifically, perivenular and endoneurial infiltration by macrophages, lymphocytes, and occasional plasma cells may be found (21). A further problem illustrated by this case involves the use of narcotic analgesia in an individual with infectious mononucleosis and narrowed airways, who was not under direct medical/nursing supervision.

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