At 9:10 PM a 47-year-old Hispanic man with severe mental disability, cerebral palsy, and a seizure disorder was transferred from a skilled nursing facility to a hospital ED with suspected aspiration pneumonia and sepsis. (This is a real case.) He had severe, chronic extremity contractures; was noncommunicative; and had a history of aspiration pneumonia and of dysphagia, for which he had long-standing orders to be given nothing by mouth. Although his gastrostomy tube was functioning normally and he’d been tolerating his feedings well, his breathing had recently become labored, with alternating episodes of tachypnea and apnea. The patient, a native of Puerto Rico, was under the care and responsibility of state and local social services.

At admission his oxygen saturation level as measured by pulse oximetry while he breathed 50% oxygen by mask was 92%. Auscultation revealed bilateral rhonchi. His heart rate varied from normal to tachycardic, while his blood pressure fluctuated between 80/65 mmHg and 138/52 mmHg. His rectal temperature was 104.5°F.

The ED staff collected blood cultures, administered IV piperacillin and tazobactam (Zosyn), and requested a chest X-ray, which indicated pneumonia (see Chest X-Ray at Presentation to the ED). They drew blood for laboratory analysis (see Laboratory Findings at Presentation) but didn’t perform arterial blood gas analysis. Dehydration was recognized, but IV access, initially established in a thumb (because of the severe contractures and dehydration), was soon lost. The patient was transferred to a hospital floor at 2:30 AM. All attempts to regain IV access failed, including an attempt by the hospital’s IV team to place a peripherally inserted central catheter. Hospital staff provided hydration through the gastrostomy tube and made plans to confer with anesthesiology later that morning to obtain central venous access.
OVERVIEW: An institutionalized man with severe mental disability and cerebral palsy, admitted from the ED with suspected aspiration pneumonia, died after a long struggle with respiratory difficulties. The cause of death was determined to be asphyxia resulting from a complete obstruction of the posterior pharynx and upper larynx by thickened oral and nasopharyngeal secretions. Although airway obstruction is common in people with motor or neurologic disorders and in those who are chronically debilitated or institutionalized, food and foreign matter are not the only culprits. This case serves to remind clinicians that a failure to provide good oral care and adequate hydration is not only poor practice but can result in death.

The patient’s labored breathing continued over the next several hours, and his oxygen saturation levels dropped as low as 83%. He showed slight improvement (less-labored breathing and normal heart rate) after he was given 100% oxygen through a nonrebreather mask, although apneic episodes became more frequent, occurring two or three times per minute. When the patient wasn’t apneic, his respiratory rate was in the 40s. Nurses noted that he had an extremely dry mouth with visible intraoral secretions, but he became combative when they attempted oral suctioning, so they stopped. Labored breathing returned, with periods of apnea, until extremely shallow respirations were followed by cardiorespiratory arrest. No resuscitation was attempted because a do-not-resuscitate (DNR) order was in place. Death occurred roughly 12 hours after presentation at the ED. The presumed cause was sepsis caused by aspiration pneumonia.

WHAT THE AUTOPSY SHOWED
After an anonymous tip to adult protective services that the patient had been neglected and possibly abused at the skilled nursing facility, the coroner’s office was contacted and accepted jurisdiction, and an autopsy was performed. The external examination established that the patient had upper- and lower-extremity contractures consistent with
An examination of the pharynx, larynx, and upper trachea revealed a significant amount of firm, gelatinous, white–yellow material completely occluding the posterior pharynx and laryngeal airway, encasing the epiglottis (see Posterior View of the Patient’s Tongue, Pharynx, and Larynx at Autopsy and Midsagittal Section of the Tongue, Pharynx, and Larynx). Microscopic examination suggested that the substance was an admixture of squamous cells, proteinaceous material, and mucus, with focal inflammatory cells and bacteria, consistent with inspissated (thickened) oral and nasopharyngeal secretions. The adjacent mucosa was histologically unremarkable.

Microscopic examination of the lungs showed no pneumonia or aspiration; admission blood cultures, as well as blood and lung cultures taken after death, were negative. The cause of death was listed as asphyxia resulting from upper airway obstruction by oral and nasopharyngeal secretions, with underlying cerebral palsy.

A subsequent investigation found that the patient had been seen in the hospital about 10 months earlier for respiratory difficulties. At that time, two “decent-sized chunks of material” had been removed from the “back of the throat.” There was no mention of that visit in the recent skilled nursing facility notes or the hospital’s own records of the patient’s final hospitalization.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Patient’s Values</th>
<th>Normal Ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>156 mEq/L</td>
<td>136–145 mEq/L</td>
</tr>
<tr>
<td>Potassium</td>
<td>3.6 mEq/L</td>
<td>3.5–5 mEq/L</td>
</tr>
<tr>
<td>Chloride</td>
<td>118 mEq/L</td>
<td>98–106 mEq/L</td>
</tr>
<tr>
<td>Carbon dioxide</td>
<td>31 mEq/L</td>
<td>21–30 mEq/L</td>
</tr>
<tr>
<td>Creatinine</td>
<td>0.9 mg/dL</td>
<td>&lt; 1.5 mg/dL</td>
</tr>
<tr>
<td>Urea nitrogen</td>
<td>38 mg/dL</td>
<td>10–20 mg/dL</td>
</tr>
<tr>
<td>Glucose (nonfasting)</td>
<td>109 mg/dL</td>
<td>&lt; 140 mg/dL</td>
</tr>
<tr>
<td>pH</td>
<td>7.56</td>
<td>7.38–7.44</td>
</tr>
<tr>
<td>White blood cell count</td>
<td>11,690/µL with a normal differential</td>
<td>3,800–10,800/µL</td>
</tr>
<tr>
<td>Hemoglobin</td>
<td>18.6 g/dL</td>
<td>13.5–17.5 g/dL</td>
</tr>
<tr>
<td>Hematocrit</td>
<td>58.5 %</td>
<td>41–53%</td>
</tr>
</tbody>
</table>
WHY THE MISDIAGNOSIS?
It’s well known that chronic debilitation from a variety of physical and neurologic deficits increases the risk of aspiration. For example, older adults are at increased risk for esophageal dysfunction, and patients with cerebral palsy frequently have trouble swallowing because of palatal or pharyngeal dysfunction, either of which may lead to aspiration. The most feared complication of aspiration, fatal asphyxiation by airway obstruction, typically involves food, with risk factors including old age, intoxication, poor dentition (the patient is toothless or has dentures), sedative use, institutionalization, and disorders affecting either motor coordination or mental function.

In patients with severe, chronic disability, such as the man described in this report, it’s frequently advisable to reduce the risk of aspiration by providing nourishment by gastrostomy or jejunostomy tube rather than by feeding tubes, which are associated with major and minor complications, including aspiration pneumonia and dehydration. Some researchers recommend using jejunostomy tubes instead of gastrostomy tubes in patients with a history of pneumonia. Given this patient’s known risk factors, it’s not unreasonable for clinicians to have initially presumed that he was experiencing another episode of aspiration pneumonia.

CAUSES OF AIRWAY OBSTRUCTION
Substances such as foreign bodies, blood, or tumors may also cause airway obstruction. And instances of inspissated secretions as the cause of death have been previously reported.

In one such report, an 84-year-old hospitalized woman died shortly after the sudden onset of labored breathing, 20 days after a severe head injury. The autopsy revealed glottal impaction of inspissated nasal secretions and pulmonary thromboemboli. The features of the woman’s inspissated secretions were similar to those described in the current case. And thickened secretions blocked the airway of a patient receiving prolonged, noninvasive, positive pressure ventilation, although the obstruction was not fatal.

Risk factors for secretion buildup. It’s well known that enteral tube feeding and nursing home residence put patients at high risk for dehydration. In fact, dehydration is of particular concern in tube-fed patients who have an altered mental status and are unable to communicate. Nursing home staff lacking in training or supervision may unknowingly contribute to residents’ dehydration. Other risk factors for the development of inspissated secretions include the use of a full face mask for ventilation, inadequate cough, depressed consciousness, and inadequate humidification when receiving oxygen at a high rate for a long period of time. In the current case, electrolyte levels indicated that dehydration was a factor. This patient’s other probable risk factors included his nothing-by-mouth status; reduced oropharyngeal motility; and impaired neurologic or mental function, contributing to poor oral hygiene.

IMPORTANCE OF ORAL HYGIENE
Inadequate oral care is one of the factors—in addition to suctioning, feeding tubes, confinement to bed, swallowing difficulty, and feeding dependency—known to increase the risk of aspiration pneumonia in nursing home residents. Despite this association, oral health care is often a low priority in patient care. Although nurses usually...
recognize pain and shortness of breath as significant priorities for treatment, they don’t assign the same importance to dysphagia (swallowing difficulties) or mouth care. In fact, in the United States, rather than have RNs perform oral care, long-term care facilities typically assign it to certified nurse assistants, many of whom lack knowledge of dysphagia and appropriate techniques for managing challenging feeding behaviors. 

Nurses who perform oral assessments should examine salivation, tongue moisture, tongue color, palate moisture, gingival appearance, the mucosa lining the cheeks, lip texture and moisture, and the teeth. At the end of life, oral care focuses on providing comfort through gentle cleansing and measures to relieve dryness (such as misting, swabbing, and applying lip balm). 

Barriers to oral care. Although neglect of oral care can cause serious health problems, a report by Wårdh and colleagues suggests that nursing assistants and home care aides may be unaware of it. They suggest that nurses give a relatively low priority to oral hygiene because it’s seen as “difficult,” “disgusting,” and, in some patients, more difficult than changing diapers. In addition, the quality of the oral health care provided to patients depends a great deal on the patient’s cooperation, and uncooperative or combative behavior deters adequate care as well as presents a potential danger to nursing personnel.

There is also legitimate debate among health care providers on how to respect a patient’s dignity and right to refuse oral health care. Ideally, such discussion will result in consensus statements on the standard of oral hygiene.

DNR status shouldn’t make a difference and doesn’t minimize the responsibility of health care personnel to provide complete care, including oral hygiene—even if the patient becomes combative. Providing oral hygiene is as much a part of basic nursing care as providing hydration, sustenance, and cleanliness—particularly since failure to do so can lead to premature death, as it did in this case. (For a discussion of best practices in oral care, see “Poor Oral Hygiene in Long-Term Care” in this issue.)

COULD THIS DEATH HAVE BEEN PREVENTED? 

Primary lung conditions such as pneumonia are often characterized by a prolonged expiratory phase of respiration, but upper airway obstruction is frequently characterized by a longer inspiratory phase. Arterial blood gas analysis and calculation of an arterial–alveolar gradient might have assisted clinicians in diagnosing the airway obstruction. But even without these additional studies, a more careful and complete physical examination (with earlier recognition of the patient’s dehydration and the discovery of oral secretion buildup) by health care providers at both the referring and receiving facilities might have prevented the patient’s death.

This case serves as a reminder: it’s essential to evaluate the mouth and upper airway of all patients with respiratory difficulties, particularly those at increased risk for aspiration. Chronically debilitated patients requiring tube feedings are particularly vulnerable to complications stemming from inadequate hydration and insufficient oral and upper airway hygiene. Failure to perform such basic hygienic tasks can result in serious adverse events, as this case illustrates. When patients refuse or are too mentally impaired to comprehend the need for oral and airway care, the care team must decide how aggressively to pursue it.

This case also reinforces the importance of medical record transfer between facilities. Since the patient had a similar episode 10 months prior to his death, knowledge of that previous episode might have allowed for quick and definitive treatment of his respiratory distress. Moreover, his death might have been prevented, either through the recognition and removal of the inspissated secretions by hospital personnel or, more appropriately, through the prevention of their formation by providers in the long-term care facility. ▼

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GENERAL PURPOSE: To explore for registered professional nurses the issues surrounding poor oral care given to vulnerable populations in long-term care settings.

LEARNING OBJECTIVES: After reading this article and “Poor Oral Hygiene and Long-Term Care” and taking the test, you will be able to

• summarize the evidence presented here describing inadequate oral care and its demonstrated risks.
• plan the appropriate interventions for delivering oral care to patients.

TEST INSTRUCTIONS

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