

# Clinically Unsuspected Epiglottitis Detected by Indium-111-White Blood Cell Scintigraphy

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A 62-yr-old woman with a history of mental retardation, paranoid psychosis and agitated depression presented with deterioration in her baseline mental status and fever. No obvious source of fever was found on clinical exam or on initial laboratory studies. An  $^{111}\text{In}$ -white blood cell ( $^{111}\text{In}$ -WBC) study was performed 1 wk after hospital admission, which revealed increased uptake in the anterior neck and oral cavity. Subsequent laryngoscopy revealed a red, swollen epiglottis compatible with epiglottitis. While not advocating  $^{111}\text{In}$ -WBC scintigraphy as part of the workup of epiglottitis, this case is presented to emphasize the possible milder presentation of epiglottitis in adults compared to children.

**Key Words:** epiglottitis; indium-111-white blood cell

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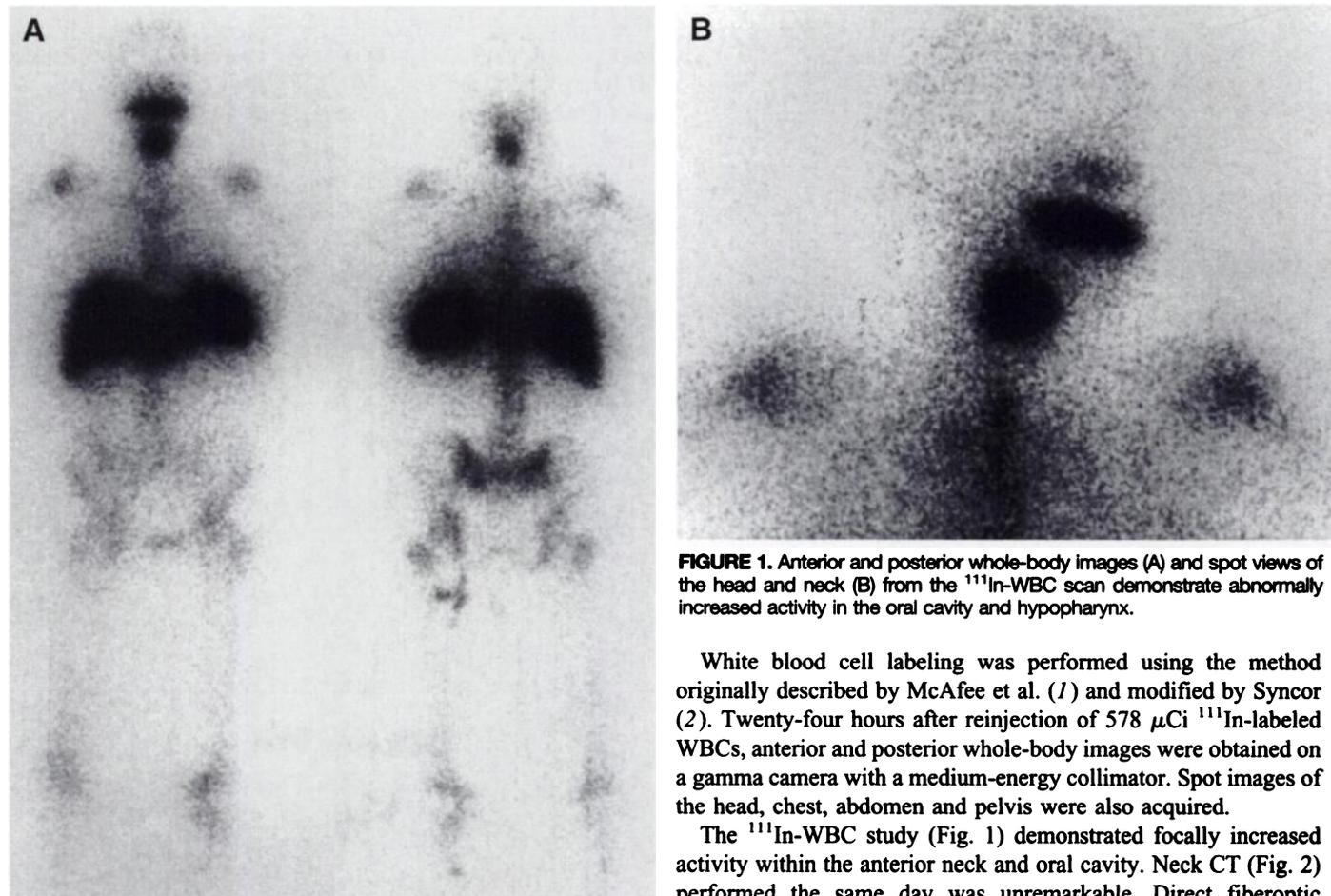
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Epiglottitis usually presents in a milder form in adults compared to children but occasionally could progress to complete airway obstruction. The detection of epiglottitis in adults may be compromised by lack of obvious symptomatology. Therefore, an awareness of its appearance on an  $^{111}\text{In}$  WBC study may play an important role in its diagnosis.

## CASE REPORT

A 62-yr-old female with a history of mental retardation, paranoid psychosis and agitated depression was admitted with deterioration in her baseline mental status, leukocytosis and an elevated CPK level. Initial clinical exam and laboratory studies revealed no obvious source. Her presentation suggested neurologic malignant syndrome, but her CPK level normalized quickly and she had insufficient myoclonic jerks to substantiate this diagnosis. Her fever and leukocytosis persisted, however, and  $^{111}\text{In}$ -WBC scintigraphy was performed 1 wk after admission to attempt to localize the source.



**FIGURE 1.** Anterior and posterior whole-body images (A) and spot views of the head and neck (B) from the  $^{111}\text{In}$ -WBC scan demonstrate abnormally increased activity in the oral cavity and hypopharynx.

White blood cell labeling was performed using the method originally described by McAfee et al. (1) and modified by Syncor (2). Twenty-four hours after reinjection of 578  $\mu\text{Ci}$   $^{111}\text{In}$ -labeled WBCs, anterior and posterior whole-body images were obtained on a gamma camera with a medium-energy collimator. Spot images of the head, chest, abdomen and pelvis were also acquired.

The  $^{111}\text{In}$ -WBC study (Fig. 1) demonstrated focally increased activity within the anterior neck and oral cavity. Neck CT (Fig. 2) performed the same day was unremarkable. Direct fiberoptic

laryngoscopy was performed and revealed a red, swollen epiglottis compatible with epiglottitis. The patient was treated with antibiotics and subsequently defervesced. She remained hospitalized for 2 mo due to other complicating factors. When she was finally nearing hospital discharge, she became acutely stridorous and experienced cardiopulmonary arrest. Resuscitation attempts were unsuccessful. Postmortem examination determined no acute cause for death but did reveal mild, chronic epiglottitis.

## DISCUSSION

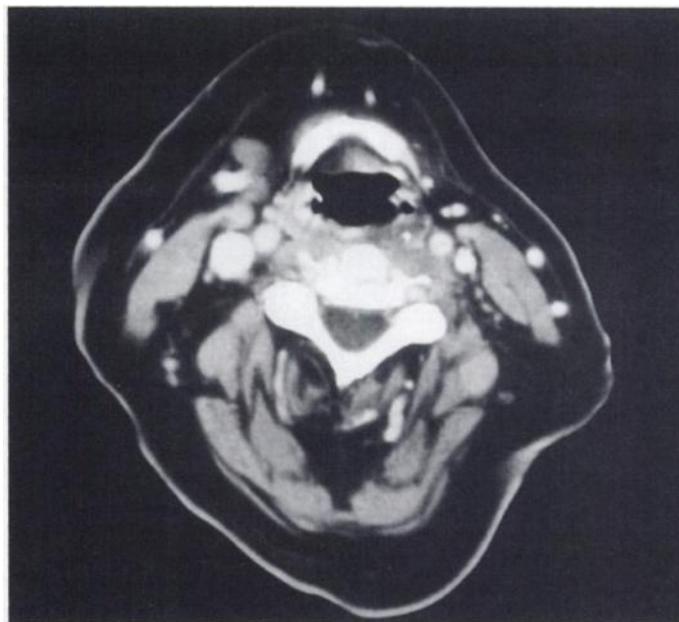
Acute epiglottitis is a potentially lethal disease that demands awareness, early recognition and proper management. It is caused by infection of the epiglottis and produces inflammatory edema which can lead to rapid airway obstruction (2).

Although the disease occurs predominantly in preschool children, approximately 25% of recently published articles concerning epiglottitis pertain to adults (3). The incidence of acute epiglottitis in children has declined significantly from 3.5 cases per 100,000 in 1980 to 0.6 cases per 100,000 in 1990 after the introduction of Haemophilus influenzae type B vaccine. During the same time period, the incidence in adults has remained stable at 1.8 cases per 100,000 (4).

Acute epiglottitis in adults can develop at any age. It occurs more frequently in men than women (4:1) and has no seasonal preference. The onset of the illness is not as abrupt in adults as in children, and the course is not as rapidly progressive. Initial symptoms include sore throat and progressive dysphagia. Respiratory difficulty may be minimal (1). If respiratory distress does occur, it may progress to total airway obstruction and death (2,5). One series of six cases of adult epiglottitis reported a 33% mortality due to respiratory arrest (6). Another report of three cases documented one death for similar reasons (7).

Diagnosis should be made rapidly by indirect laryngoscopy. Lateral neck x-ray may be used to confirm the diagnosis. Adults with epiglottitis not experiencing respiratory distress at presentation should be closely monitored. An artificial airway should be readily established if needed. The antibiotic selected should cover the wide spectrum of possible etiologic bacteria (2).

The pathophysiology of epiglottitis involves inflammation of the supraglottic structures and may involve, in addition to the epiglottis, the aryepiglottic folds, the arytenoids, and frequently the entire supraglottic larynx. The most common bacteria isolated from children with epiglottitis is Hemophilus influenzae type B. In adults, other bacteria often involved include staphylococci, various streptococci, Neisseria catarrhalis, pneumococci, micrococci and klebsiella, as well as fungi and viruses. Histologic findings include an abundant mucosal and submucosal infiltrate of neutrophils most marked in the epiglottis but also involving the aryepiglottic folds and adjacent pharyngeal walls (2). These histologic findings explain the appearance on <sup>111</sup>In-WBC scintigraphy.



**FIGURE 2.** CT of the neck performed the same day reveals a normal-appearing epiglottis with no evidence of inflammation.

Indium-111-oxine-labeled WBC scans have been demonstrated to have a relatively high sensitivity (87%) and specificity (90%) for detection of acute infections (8). One of the main advantages of this technique is the ability to perform whole-body scans. Total-body imaging of patients with fever and no localizing signs can be very useful in difficult clinical situations (9). In this case it revealed an unsuspected source of infection which is potentially lethal.

## CONCLUSION

This case exemplifies the usefulness of <sup>111</sup>In-WBC scanning in detecting infections of this type and suggests that it may be complementary when other modalities are inconclusive.

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