Transthoracic Needle Aspiration: A Useful Technique to Detect Causative Organisms of Pneumonia

**Key words:** community-acquired pneumonia, *Streptococcus milleri* group, anaerobe, pneumothorax

Community-acquired pneumonia (CAP) has been a common and serious illness and cause of hospital admission with a significant morbidity and mortality, in spite of a remarkable development of antimicrobial agents and chemotherapy in recent years.

The knowledge of predominant microbial patterns in CAP represents the basis for initial decisions about its empirical antimicrobial treatment (1). However, most large studies failed to identify a causative organism in less than 50% of patients with CAP (1–5). In addition, the microbial patterns reported have differed considerably depending on the extent and nature of the microbiologic techniques used, such as sputum culture, blood culture, and serological studies. The conventional diagnostic tests for pneumonia lack specificity or an unconvincing description with multiple pathogens (6, 7). In this issue of Internal Medicine, Ishida et al (8) report a case series in which transthoracic needle aspiration (TNA) was performed, describing the efficacy, safety, and greater detection of anaerobes and microaerophilic streptococci such as *Streptococcus milleri* group than reported before.

Sputum culture and Gram stain are the most common techniques used in Japan in the pursuit of the causative agent of pneumonia, but contamination due to the flora of oral cavity and upper airway cannot be avoided. Techniques such as trans-tracheal aspiration and telescoping plugged catheter have been advocated to avoid contamination, but TNA yields definitive causative agents isolated more frequently than other techniques (6). In this sense, TNA is the most acceptable and uncontaminated technique to determine the microbiology of pneumonia. However, it is not practiced routinely because of the potential for adverse events. The major complication due to TNA is pneumothorax, but the frequency is low. Although hemoptysis is relatively common, it is usually a small amount and is self-limited.

The noteworthy finding of the study by Ishida et al (8) is that *S. milleri* group and anaerobes were frequently isolated, following *Streptococcus pneumoniae*. We have previously claimed that the *S. milleri* group has a significant role in respiratory infections (9). Ishida et al (8) proved a much higher relevance of *S. milleri* group and anaerobes in CAP than ever reported, even if it is taken into consideration that there may have been a selection bias for cases in whom TNA was performed, as they described. They already revealed their high prevalence in a prospective study on the etiology of CAP in Japan (10), in which they used several techniques in combination to confirm causative agents. The organisms colonize as commensals in the mouth and upper respiratory tract, and conventional microbiological techniques cannot readily confirm the causative role. TNA can be the most appropriate technique to detect these organisms.

TNA has a significant role in microbiological studies in pneumonia. It provides useful information on causative species with a high specificity which can be beneficial for therapeutic management. It worthy to obtain microbiologic information even if minimal serious adverse effects are considered (11). TNA is applied for not only CAP but also for patients who have not responded to initial therapy, who have nosocomial pneumonia, and who have even extensive and severe ventilated nosocomial pneumonia when other diagnostic procedures such as telescoping plugged catheter or BAL have not been able to diagnose the microbiologic cause of the pneumonia (12, 13). The more complex the patient’s clinical course, the more valuable the information obtained (11).

I agree with the claim of Ishida et al (8) that TNA should be used in combination with conventional methods. I also suggest that as many as possible techniques available to date should be used for microbiological diagnosis. The newer techniques such as antigen detection methods and PCR, which do not depend on viable organisms, are probably less affected by the administration of antimicrobial agents, and are useful to detect microorganisms, such as *Mycoplasma*, *Chlamydia*, *Rickettsia*, *Pneumocystis carinii* and viruses, that are relatively hard to detect by conventional methods. They can contribute to elucidate the microbiological etiology of pneumonia. In fact, there is a report on the usefulness of the combination of PCR and antigen latex agglutination test with samples obtained by TNA (14). It is my hope that numerous novel techniques will be developed and will become widely available, and provide a good standard for microbiological diagnosis as early as possible.

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