

## Mediastinoscopy: An Endangered Species?

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This editorial carries the same title as an article recently published by Rusch<sup>1</sup> on mediastinal staging in lung cancer. In that article, the well-known thoracic surgeon presented the promising advances made in the assessment of the mediastinum thanks to the development of new technology that she believed would limit the future of mediastinoscopy.

To date, mediastinoscopy has been considered the gold standard sampling method in the histologic evaluation of the mediastinum. However, this method of examination is far from ideal. Mediastinoscopy is a surgical technique and as such requires an operating room, an anesthesia team and a minimum hospital stay, all of which significantly increases the cost of health care. Moreover, mediastinoscopy is certainly not free of complications, some of which are serious and even fatal. The sensitivity of mediastinoscopy is 85% and specificity 100%, but most of the 10% of false negatives are so because the affected lymph node station was not reached.<sup>2</sup> It is therefore good to remember that mediastinoscopy is a technique with a clear learning curve. Occasionally, the subcarinal region is not reached for fear of injuring the right pulmonary artery.<sup>1</sup> Certain mediastinal zones, such as the posterior and inferior subcarinal regions (stations 8 and 9),<sup>2</sup> cannot always be assessed by mediastinoscopy. Finally, the high yield of mediastinoscopy is based on the assumption that samples are systematically taken from several lymph node stations (2R, 2L, 4R, 4L, 7), which does not often occur in ordinary clinical practice.<sup>1</sup> Evidently, if these requirements are not met, diagnostic yield may decrease significantly.

From this standpoint, the possibility of reaching the mediastinum with a noninvasive procedure through the tracheobronchial tree during bronchoscopic examination offers a unique opportunity to optimize the diagnosis and assessment of the extension of thoracic disease. Transbronchial fine-needle aspiration, or the method of Wang and colleagues,<sup>3</sup> makes it possible to approach most mediastinal lymph node stations while hardly increasing examination time and without the need for an operating room, anesthetists or hospitalization. Costs are considerably lower than for mediastinoscopy and complications are rare

and generally not serious. In expert hands, sensitivity rates higher than 80% may be achieved with a very low percentage of false positives. However, this high positivity will also depend on several factors, such as the number of aspirates, the size and location of the adenopathy, the presence of the pathologist or the prevalence of lymph node metastasis in the study population.<sup>4,5</sup> In this context, the limited use of transbronchial needle aspiration in some bronchoscopy units in Europe and America is surprising. Likely explanations for the underuse of transbronchial needle aspiration include the fact that even in expert hands the initial yield of this technique is low, potentially demotivating the bronchoscopist somewhat. However, transbronchial needle aspiration is a technique with a clear learning curve, which confirms the saying that "you only do well what you do often." Another reason for the underuse of transbronchial needle aspiration is the possibility of false positives. However, several studies confirm that they are exceptional if minimum precautions are taken, such as avoiding aspiration in areas where the bronchial mucosa has been invaded or near lymph nodes adjacent to the primary tumor. Finally, concern for blind aspiration in an anatomical area as vascularized as the mediastinum may explain its limited use, despite the fact that all the series agree in showing that the rate of complications is barely 0.3%.<sup>6</sup> Certainly, the appearance of endobronchial ultrasound to guide transbronchial fine-needle aspiration with real-time visualization of the mediastinal lymph nodes will involve a radical and definitive change in assessment of the mediastinum. The results obtained with this technique are truly remarkable,<sup>7,8</sup> not only for their diagnostic yield, but also for their ability to evaluate mediastinal lymph nodes of up to 3 mm.<sup>9</sup> It seems clear that endoscopists will finally become responsible for studying the mediastinum in the near future, whether through the bronchial tree or through the esophagus in specific cases in which accessing stations 8 and 9 is necessary. Indeed, there has been a highly significant decrease in the number of mediastinoscopies carried out at centers where endoscopic ultrasound is systematically performed.<sup>9</sup> Although the current cost of endoscopic ultrasound means that it is only available at very few centers in Spain, the overall benefits and the improved cost-benefit ratio compared to mediastinoscopy will undoubtedly facilitate its progressive adoption by various bronchoscopy units. An observation I would make is that bronchoscopists

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should familiarize themselves with blind transbronchial needle aspiration, since the skills acquired while using this technique are essential for obtaining the best yield possible when ultrasound-guided bronchoscopy eventually becomes available.

Although transbronchial needle aspiration is most commonly used for the staging of lung cancer, its potential advantages are not limited to this disease. Hence, its utility has been described for diagnosing other proliferative disorders, such as extrathoracic neoplasms, lymphomas, mediastinal cysts, and various infections such as tuberculosis and histoplasmosis.<sup>10</sup>

One of the lung diseases in which transbronchial needle aspiration may be particularly useful is sarcoidosis, as has been clearly demonstrated in an interesting article by Fernández-Villar et al<sup>11</sup> in this issue of *Archivos de Bronconeumología*. How important is transbronchial needle aspiration in this granulomatous disease? According to clinical guidelines, the diagnosis of sarcoidosis requires an appropriate clinical picture indicating this condition plus cytohistologic demonstration of noncaseating granulomas.<sup>12</sup> To date, the procedure of choice for obtaining tissue in the diagnosis of pulmonary sarcoidosis is transbronchial biopsy, which has an overall yield of 65% (range, 40%-90%); this procedure becomes optimal when 4 to 10 biopsy specimens are obtained.<sup>13</sup> However, ordinary clinical practice often fails to achieve that diagnostic yield because fewer specimens are taken, probably for fear of possible complications, in particular a 5% risk of pneumothorax and a 2% risk of bronchial hemorrhage.<sup>14</sup> The results achieved with transbronchial needle aspiration in the series of patients with sarcoidosis analyzed by Fernández-Villar et al<sup>11</sup> confirm the experience previously reported by Trisolini et al<sup>15</sup> and provide support for certain basic concepts: transbronchial needle aspiration is a safe procedure for studying pulmonary sarcoidosis and its diagnostic yield is very high (60%-80%), indeed, higher than that achieved with transbronchial biopsy. The combined use of both procedures allows a diagnosis to be made in 90% of the cases. It therefore seems indisputable that transbronchial needle aspiration will also become an obligatory procedure for diagnosing any patient suspected of having pulmonary sarcoidosis. A note of caution would be that since the presence of noncaseating granulomas is not exclusive to sarcoidosis, it will be necessary to carefully monitor cases of atypical clinical presentation.

In summary, a false debate on the efficacy of the various procedures for mediastinal assessment is not the issue, among other reasons because the yield of each one will differ according to the lymph node station in question. What is really important is that the future of mediastinal assessment will pass through the airway. Blind transbronchial needle aspiration is the forerunner to a series of technological advances that will culminate in the

design of real-time ultrasound bronchoscopy. Such advances will optimize the management of patients with mediastinal disease whether consideration is given to factors of clinical efficacy, safety, and patient well-being or to cost-benefit factors. Ultrasound bronchoscopy certainly scores highly in all the aspects mentioned, and it is evident that this procedure will eventually become the leading technique in the routine management of these patients.

As the aforementioned article by Rusch concluded: "Stay tuned. The standard of care is evolving."

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