Learning curve: Endobronchial ultrasound-guided needle aspiration

Sir,

The skill of performing interventional procedures is associated with a learning curve depending on skill, expertise, and training of the interventionist. Here, we would like to report the learning time required to achieve proficiency in the technique of endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA). Various studies have shown wide variation in the learning ability ranging from 10 to 100 procedures. The American College of Chest Physicians (ACCP) empirically recommends 50 EBUS-TBNA under supervision.[1] In contrast, the proficiency was reported to be obtained adequately even after 10 procedures in other single center experiences.[2]

In India still, we practice-see one, learn one under the supervision and do one dictum, and Indian data on the learning curve of EBUS-TBNA is limited. Therefore, we analyzed data of our center retrospectively to find out our learning curve of acquiring competence.

The EBUS scope was acquired at Asthma Bhawan, Jaipur in May 2016. Two pulmonologists trained in the technique of flexible bronchoscopy observed the procedure in 20 cases at an expert center and performed one procedure under supervision. Consecutive cases who underwent EBUS-TBNA for mediastinal adenopathy were included in the study. Sample yield showing abnormal diagnosis or lymphoid cells was considered adequate, and noncellular or bronchial sample was taken as inadequate.

We analyzed the diagnostic yield calculated in blocks of five consecutive patients. In the first block of five cases, it was only 20%, while it became 60% in the second block of five patients (6–10 cases). In the third block, it became 80% but reduced to 60% in 4th block. Thereafter, it remained 80% or above except one occasion. Therefore, our data suggest that at least 20 independently done cases are necessary to cross the barrier of EBUS learning curve for an expert bronchoscopist [Figure 1].
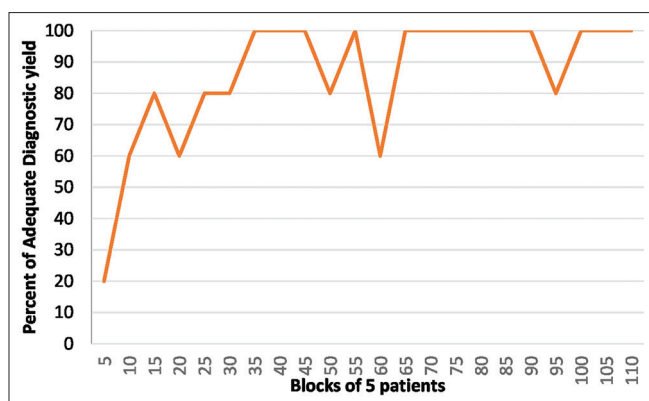
Figure 1: Adequacy of samples in blocks of consecutive five patients

Although the number of minimum cases needed to gain expertise in EBUS varied from 10 to 100 in different studies, yet majority of studies reported around 40 procedures. European Respiratory Society guidelines recommended initial learning curve of 40 cases for EBUS-TBNA.[3] ACCP in 2003 gave a number of 50 cases as learning curve.[1] However, both these guidelines were done on radial EBUS-guided TBNA. Single center experiences recommend 10–25 cases to achieve proficiency in technique of EBUS-TBNA for both benign and malignant disorders.[2,4] A multicenter study, however, reported as low as 13 cases to achieve proficiency.[5] Kemp *et al.* divided the EBUS operators into four groups and found variation in the learning ability of different individuals ranging from 10 to 100 procedures.[6] However, these data are primarily from countries in the western hemisphere where the predominant disease to affect the mediastinal lymph nodes is malignant, in contrary to India where benign disorders such as tuberculosis and sarcoidosis predominate.[7,8] Srinivasan *et al.* showed that with experience, yield improves and they reported sarcoidosis and then tuberculosis as the most common diagnosis.[9]

On the basis of our results and available literature, we wish to emphasize that a trained bronchoscopist should do at least 20 EBUS-TBNA procedures before expecting a good diagnostic yield. However, our study had several limitations including (1) evaluation of the learning ability of only two bronchoscopists; (2) unavailability of rapid onsite cytological evaluation; (3) the learning curve of the pathologist and microbiologist was not studied separately; and (4) results were not compared with gold standard mediastinoscopy to rule out false negatives. Nonetheless, the learning curve should be kept in mind while training residents and fellows in the technique of EBUS-TBNA.

As per our experience, we advocate that a trained bronchoscopist needs to perform 20 independent EBUS-TBNA procedures to overcome the learning curve and obtain optimal yield even in Indian settings where benign disorders of mediastinum predominate.

Conflicts of interest
There are no conflicts of interest.

Nishtha Singh, Sheetu Singh[1], Virendra Singh

*Department of Respiratory Medicine, Asthma Bhawan,
[1]Department of Chest and Tuberculosis,
SMS Medical College, Jaipur, Rajasthan, India
E-mail: drnishthasingh@gmail.com*

REFERENCES

1. Ernst A, Silvestri GA, Johnstone D; American College of Chest Physicians. Interventional pulmonary procedures: Guidelines from the American College of Chest Physicians. Chest 2003;123:1693-717.
2. Groth SS, Whitson BA, D'Cunha J, Maddaus MA, Alsharif M, Andrade RS, *et al.* Endobronchial ultrasound-guided fine-needle aspiration of mediastinal lymph nodes: A single institution's early learning curve. Ann Thorac Surg 2008;86:1104-9.
3. Bolliger CT, Mathur PN, Beamis JF, Becker HD, Cavaliere S, Colt H, *et al.* ERS/ATS statement on interventional pulmonology. European Respiratory Society/American Thoracic Society. Eur Respir J 2002;19:356-73.
4. Bellinger CR, Chatterjee AB, Adair N, Houle T, Khan I, Haponik E, *et al.* Training in and experience with endobronchial ultrasound. Respiration 2014;88:478-83.
5. Wahidi MM, Hulett C, Pastis N, Shepherd RW, Shofer SL, Mahmood K, *et al.* Learning experience of linear endobronchial ultrasound among pulmonary trainees. Chest 2014;145:574-8.
6. Kemp SV, El Batrawy SH, Harrison RN, Skwarski K, Munavvar M, Rosell A, *et al.* Learning curves for endobronchial ultrasound using cusum analysis. Thorax 2010;65:534-8.
7. Sehgal IS, Dhooria S, Gupta N, Bal A, Ram B, Aggarwal AN, *et al.* Impact of endobronchial ultrasound (EBUS) training on the diagnostic yield of conventional transbronchial needle aspiration for lymph node stations 4R and 7. PLoS One 2016;11:e0153793.
8. Gahlot T, Parakh U, Verma K, Bhalotra B, Jain N. Endobronchial ultrasound-guided transbronchial needle aspiration in diagnosing mediastinal lymphadenopathy. Lung India 2017;34:241-6.
9. Srinivasan A, Agarwal R, Gupta N, Aggarwal AN, Gupta D. Initial experience with real time endobronchial ultrasound guided transbronchial needle aspiration from a tertiary care hospital in North India. Indian J Med Res 2013;137:803-7.

Access this article online	
Quick Response Code:	**Website:** www.lungindia.com
	DOI: 10.4103/lungindia.lungindia_434_18

How to cite this article: Singh N, Singh S, Singh V. Learning curve: Endobronchial ultrasound-guided needle aspiration. Lung India 2019;36:178-9.