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Case report

Convex-probe endobronchial ultrasound for thyroid biopsy a new hybrid method

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ABSTRACT

Nowadays we use novel diagnostic equipment for lung cancer. Bronchoscopy was the tip of the arrow for diagnosis, however; ultrasound systems have brought a revolution. We have the radial-endobronchial ultrasound for peripheral lesions and the convex probe endobronchial ultrasound for central lesions. Ultrasound endoscopic systems can be used for the diagnosis of any lesion that can be approached from the airways. In the current manuscript we will present two methods for the biopsy of thyroid gland. The first method is using anesthisiological tools and the second tools from the ear, nose and throat department.

1. Introduction

Lung cancer can be diagnosed with endoscopic procedures, biopsy under CT-guidance, surgery and thoracoscopy [1–3]. In any case it is known that any pathological findings in the thorax (lymphnodes, mass) does not necessarily mean that the diagnosis is lung cancer. Based on the site of the lesion front mediastinum, middle or back there are different diagnosis. Convex probe endobronchial ultrasound and the radial endoscopic ultrasound have brought a revolution in the diagnosis of thoracic lesions [1,4]. In any case we can use endoscopic techniques in order to make a biopsy for any lesion within the thorax if possible, as long as we can achieve all the necessary safety conditions for the patient. The thyroid gland is located in the upper part of the thorax and front part of the thorax and it attached to the trachea. Any tissue that is attached to the large airways is visible with the convex probe endobronchial ultrasound. In the current case we present two hybrid methods in order to take biopsy from the thyroid gland.

2. Case and method

We present a case of a 65 year old male with a pathologically expanded thyroid gland. The levels of TSH were 6 times the normal values. In some cases a biospy of the thyroid gland can be made under U/S guidance (transdermal), or with surgery. In our case we decided to make the biopsy with a 21G needle under the guidance of the convex probe endobronchial ultrasound due to technical aspects (position and expansion of the thyroid gland). Fig. 1. In order to perform the biopsy we used a laryngeal mask with an airway opening similar to a number 9 tracheal tube. (Figs. 2 and 3). Due to the known ventilatilation limitations of using a laryngeal mask we then used a "hybrid" method were we used tools from our ear, nose and throat department (Figs. 4–6). We performed in total 4 biopsies two with the use of a laryngeal mask as a ventilation method and two with the rigid ENT scope. In order to proper ventilate the patient with the rigid scope we firstly pre-oxygenated the patient being intubated with a No. 6 tracheal tube and then we removed the tracheal tube and performed a biopsy. The procedure was performed twice with the rigid scope. The duration of the procedure in total was 35 minutes.

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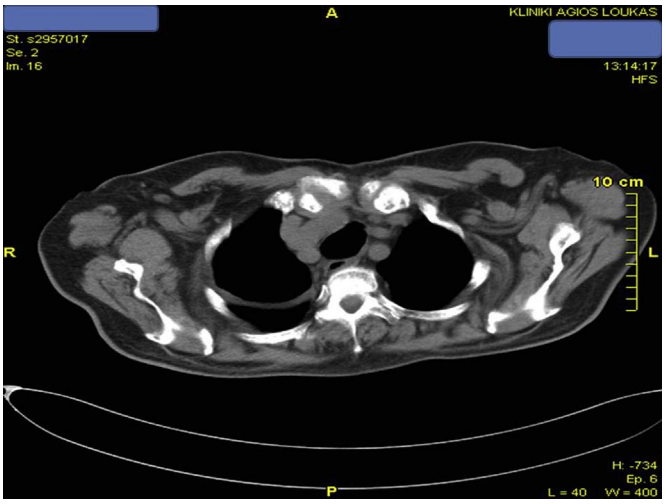

Fig. 1. CT of the thorax showing the expanded thyroid gland.

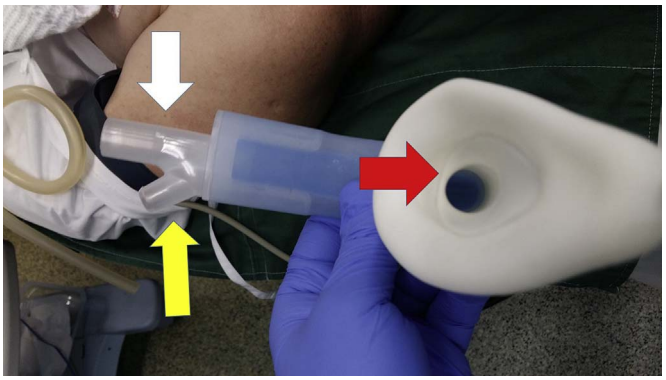

Fig. 2. Laryngeal mask: White arrow indicates the tube were the ventilator is connected, red arrow indicates the tube were the air and endoscopic equipment is coming out and yellow arrow indicates the tube were cleaning of the secretions can be made.

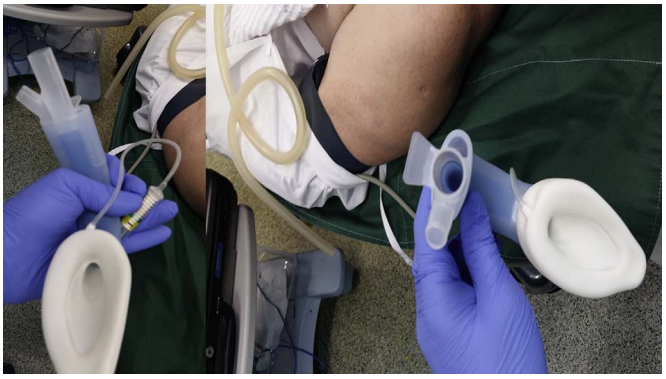

Fig. 3. Laryngeal mask.

3. Discussion

A major issue that all interventional endoscopic procedures have is the proper ventilation of the patient. Always when performing interventional procedures to the respiratory system either in the upper airways or in the lower respiratory we have to make sure that proper ventilation is maintained throughout the procedure. We prefer to use jet-ventilation ventilation mode in order to minimize the CO_2 (high tidal volume, high respiratory rate) [5]. "Safe airway" should be the priority before starting any interventional endoscopic procedure in the respiratory system. Hemostasis is another issue that has to be arranged

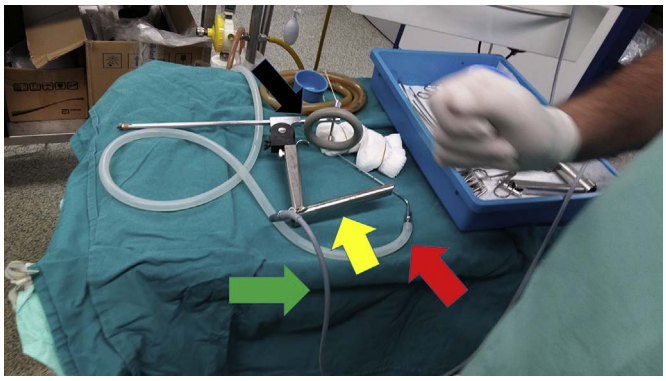

Fig. 4. Rigid ENT scope: Red arrow indicates the suction for the secretions, Yellow arrow indicates the main construction of the rigid ENT scope, Green arrow indicates the light source and black arrow indicates the base of the ENT scope.

Fig. 5. Red arrow indicates the tendotracheal tube No. 6 and the yellow arrow indicates the position of the base of the ENT rigid scope.

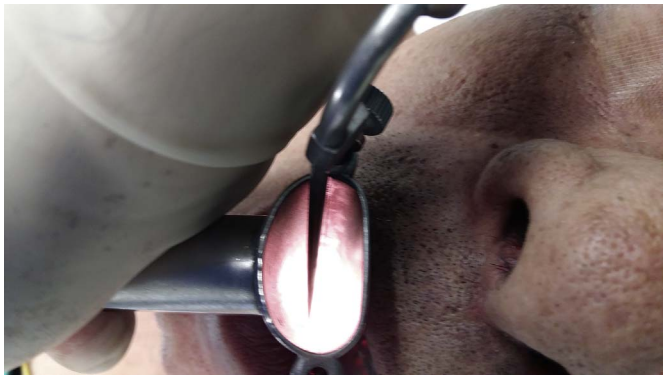

Fig. 6. The ENT rigid scope positioned.

within a procedure in the airways since hemorage reduces/blocks the proper patient ventilation. There are several measures that the user can take in order to prevent or encounter hemorage. The hybrid method of rigid bronchoscope with flexible is being used in the everyday practice for interventional procedures in the airways, in our patient we did not use a rigid bronchoscope due to technical aspects as the location of the thyroid lesion with the use of the rigid bronschoscope did not provide a sufficient window for proper visualization and biopsy with the convex probe EBUS (Fig. 7.). Propofol, remifentanil and atracurium and for antidote neostigmine2.5mg/ml and atropine 1mg/ml based on the dosage of the anesthesiologic drugs that were given. We give bolus dosages at the beginning based on the duration of the procedure as we expect it to last from our initial planning. Moreover; we had an issue with the increased pressure of the tip of the rigid bronschoscope, therefore we considered alternative method. The anesthiological mask

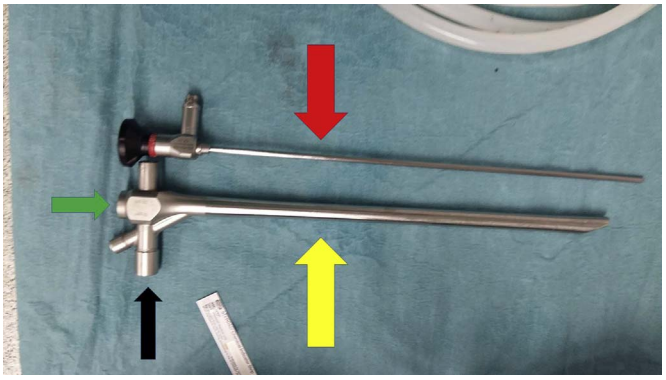

Fig. 7. Red arrow indicates the rigid light source, yellow arrow indicates a STORZ rigid bronchoscope 12mm with a working channel of 11mm, black arrow indicates the connector with the ventilator and the green arrow indicates the working channel.

has been previously used along with a convex probe endobronchial mask [6], however; we proceeded a step further with the use of an ENT rigid scope. This hybrid method provides a safe airway and proper window for biopsy, however; certainly the duration of the procedure is longer.

Conflict of interest

None to Declare.

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