Vocal cord dysfunction: Ultrasonography-aided diagnosis during routine airway examination

Sir,

Ultrasound (USG) is a noninvasive modality for assessing the integrity of both recurrent and superior laryngeal nerve in patients. The vocal cord movements during phonation can be visualized real-time using USG.[1] Here, we present two patients who were incidentally diagnosed to have vocal cord palsy on airway USG examination when they presented to our department for pre anaesthetic check up (PAC) examination.

Sixty years American Society of Anesthesiologists (ASA) I male scheduled to undergo laparoscopic cholecystectomy presented to our outpatient department for PAC examination. He had a history of hemithyroidectomy 2 years back and was not on any medications. During routine airway examination using USG, the following parameters were noted:

1. Left vocal cord shortened and in cadaveric position (far away from midline)
2. No movement of left vocal fold (VF) during phonation and breathing
3. Closure of glottis occurs during phonation by adduction of the right VF beyond midline
4. VF displacement velocity (VFDV) by apply pulsed Doppler and Doppler gate was 19.8 cm/s [Figure 1].[2]

A 55-year ASA I male BMI = 32 kg/m^2, scheduled to undergo laparoscopic inguinal hernia repair underwent routine USG airway examination. The following observations were noted:

1. Left vocal cord shortened, thinned and in cadaveric position (far away from midline)
2. No movement of the left VF during phonation and breathing
3. Closure of glottis occurs during phonation by adduction of the right VF beyond midline
4. VFDV by apply pulsed Doppler and Doppler gate was 16.8 cm/s [Figure 2].

Both these patients were subsequently referred to ENT department where their diagnosis was confirmed using indirect laryngoscopy.

Vocal cord palsy is considered as a sign of underlying disease and could be congenital/acquired, unilateral/bilateral. Incidence ranges around 0.42% with a male: female ratio 3:1.[3] Most common presentation is hoarseness of voice. Around 30% patients remain asymptomatic and diagnosis is made incidentally.[4] Several methods have been described to monitor recurrent and superior laryngeal nerve function.

1. Direct visualization under fiberoptic bronchoscope
2. Indirect laryngoscopy
3. Palpation of larynx during stimulation of nerve
4. Laryngeal muscle electromyography
5. Electromyography with orotracheal tube inserted electrodes
6. Computed tomography and magnetic resonance imaging.

USG is a simple, radiation-free technique to diagnose vocal cord dysfunction. Anesthesiologists are using sonography especially for airway evaluation, regional anesthesia, and critical care. During routine airway examination, evaluation of vocal cords can also lead to a diagnosis of asymptomatic VC dysfunction. The high-frequency linear probe is kept perpendicular to the trachea to identify the normal structures

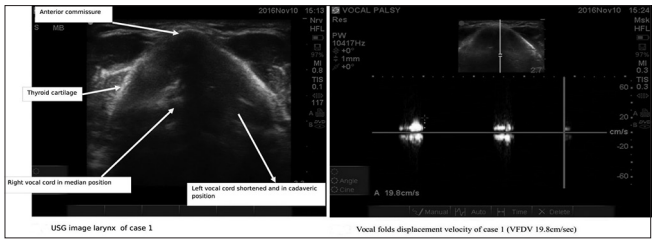

Figure 1: Ultrasound image of the first patient

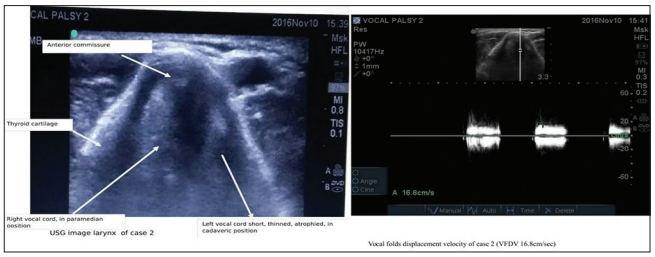

Figure 2: Ultrasound image of the second patient

of neck: carotid artery, jugular vein, tracheal ring, thyroid cartilage, arytenoids, and VFs. Thereafter, the probe is kept transversely over the thyroid cartilage to view the VF movements. After localizing vibrating VF, the system is switched to pulsed Doppler mode, and the Doppler gate set on the VF vibrating part. Thereafter, the range of tissue velocity is recorded and analyzed. The VFDV at the most comfortable pitch is about 68 ± 10 cm/s.[2]

The diagnosis of vocal cord palsy is important to an anesthesiologist for the following purposes: documentation, medico-legal issues, further workup, and intubation decision-making. According to ASA closed claims database, 33% of all the airway injuries are in the larynx secondary to intubation.[5] Hence, we suggest that in all high-risk patients a routine USG examination of the airway including the vocal cords should be incorporated by the anesthesiologist in the PAC itself.

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Conflicts of interest
There are no conflicts of interest.

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