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Paradoxical Vocal Fold Motion

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Paradoxical Vocal Fold Motion

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Presentation of Pathophysiologic Process

What is it?

Laryngoscopic figures

Anterior

Vocal cords

Anterior

Posterior

Figure C

Figure D

Table 1. Normal inspiration vs. VFD inspiration

Paradoxical vocal fold motion (PVFM), otherwise known as vocal cord dysfunction (VCD) is a paradoxical degree the vocal folds adduct upon inspiration causing airway narrowing. This restriction can cause severe dyspnea and can be misdiagnosed as asthma. The cause of the abnormality related to PVFM has not been directly recognized, but multiple factors or triggers are associated. It is of key importance to recognize VCD as asthma and wean the patient to exercise challenged asthma. The new diagnosis was reached after inhalers were proving ineffective. My lack of confidence to continue my research

Signs and Symptoms

Examples include: cough, hoarseness, throat and neck tightness, anxiety, choking, dyspnea, snoring, noisy breathing (stridor), frequent clearing of throat, and dysphonia (MacConnell and Danielson, 2014). Syndrome of VCD and asthma can often be misdiagnosed in VCD patient. In recent years, the vocal cord adduction in VCD patient will often report the source of airway tightness in the neck or upper chest (Marinec, Thompson, Chiang, Forrest, and Defilis, 2011). The diagnosis of PVFM is commonly delayed by 5 to 10 years (MacConnell, Thompson, Chiang, Forrest, and Defilis, 2011). If healthcare providers were trained to recognize this diagnosis earlier, many patients may avoid treatments that are often ineffective emergency treatments could be avoided as well. In anesthesia, anesthesiologists are often called to treat emergent airway situations like laryngospasm such as halogen, laryngospasm, and aspiration because treatments can range from using a bronchodilator to intubation to epinephrine injection (Nesburn, Taitt-Wynter, and Rosenblatt, 2000).

The presentation of vocal cord dysfunction is dependent on the individual. Common symptoms include: cough, hoarseness, throat and neck tightness, anxiety, choking, dyspnea, snoring, noisy breathing (stridor), frequent clearing of throat, and dysphonia (MacConnell and Danielson, 2014). Syndrome of VCD and asthma can often be misdiagnosed in VCD patient. In recent years, the vocal cord adduction in VCD patient will often report the source of airway tightness in the neck or upper chest (Marinec, Thompson, Chiang, Forrest, and Defilis, 2011). The diagnosis of PVFM is commonly delayed by 5 to 10 years (MacConnell, Thompson, Chiang, Forrest, and Defilis, 2011). If healthcare providers were trained to recognize this diagnosis earlier, many patients may avoid treatments that are often ineffective emergency treatments could be avoided as well. In anesthesia, anesthesiologists are often called to treat emergent airway situations like laryngospasm such as halogen, laryngospasm, and aspiration because treatments can range from using a bronchodilator to intubation to epinephrine injection (Nesburn, Taitt-Wynter, and Rosenblatt, 2000).

The significance of paradoxical vocal fold motion or VCD and its paradoxical vocal fold motion has led me to better understand the pathogenesis, comorbidities, and implications of the diagnosis. This understanding will help me communicate with others about VCD and teach about it. Knowing that something can cause such a deceasing breath, use many healthcare resources, and can be well controlled with proper guidance gives me confidence to continue my research and communicate with others who have found. It will be interesting to learn more of findings of research such as the effects of smoking on VCD.

Significance of Pathophysiology

The significance of paradoxical vocal fold motion or VCD and its pathophysiology has been found in its incidence, misdiagnose, and emergency responses. The incidence of VCD is estimated at 3% of the population with a female to male ratio of approximately 2:1 (Cohen, 2010). The pathophysiology can be caused by significantly higher incidence in competitive athletes, high achievers, and healthcare professionals (Cohen, 2010). Another reason PVFM is significant is that it is often misdiagnosed as asthma. PVFM sufferers are often diagnosed with asthma as indirect asthma and unnecessary treatments like beta adrenergic agonists, corticosteroids, hospitalization, and mechanical ventilation care (sometimes even tracheostomy placement). The appropriate diagnosis of PVFM is commonly delayed by 5 to 10 years (MacConnell, Thompson, Chiang, Forrest, and Defilis, 2011). If healthcare providers were trained to recognize this diagnosis earlier, many patients may avoid treatments that are often ineffective emergency treatments could be avoided as well. In anesthesia, anesthesiologists are often called to treat emergent airway situations like laryngospasm such as halogen, laryngospasm, and aspiration because treatments can range from using a bronchodilator to intubation to epinephrine injection (Nesburn, Taitt-Wynter, and Rosenblatt, 2000).

Underlying Pathophysiology

The underlying pathophysiology of vocal cord dysfunction is not well defined as causes are multifactorial. There are many associated causative factors to VCD, but there is no clear unifying pathophysiology (Deckert & Deckert, 2010). Inferred from the research, it seems that all of the causative factors are related to some sort of stress including physical, mechanical, technical, and psychological components. These associated factors include: exercise, psychological conditions, irritants, rhinorrhea, gastroesophageal reflux disease, psychological interaction, and medications (Deckert & Deckert, 2010). A common causative factor is exercise, often misdiagnosed as exercise induced asthma, exercise can precipitate VCD (Deckert & Deckert, 2010). Success or failure of bronchodilators can help diagnose exercise induced asthma from VCD (Deckert & Deckert, 2010). Psychological conditions like posttraumatic stress disorder, anxiety, and depression can cause PVFM as well (Deckert & Deckert, 2010). Anxiety being of high prevalence in teenage patients with vocal cord dysfunction (Deckert & Deckert, 2010). Environmental and chemical irritants are known to cause symptoms of VCD as well. Studies have shown an increased onset of symptoms with time of exposure to irritants like ammonia, motor oil, exhaust fumes, and cleaning chemicals (Deckert & Deckert, 2010). There is a high prevalence of rhinorrhea in patients with vocal cord dysfunction (Deckert & Deckert, 2010). Postnasal drip associated with rhinitis is linked to airway hyperresponsiveness and another possible contributor to VCD (Deckert & Deckert, 2010). Endotracheal intubation has been directly related to the pathogenesis of vocal cord dysfunction. In one study an endotracheal tube caused neurological injury to the recurrent laryngeal nerve and resulted in dysphonia and VCD (Kupper, Callaghan, and Hogphin, 2014). Gastroesophageal reflux disease has been associated with high prevalence in vocal cord dysfunction (Deckert & Deckert, 2010). Neurological drugs such as benzodiazepines (Companis, Fumeroen, can cause transient VCD as well (Deckert & Deckert, 2010).

Flow Volume loops

Researching paradoxical vocal fold motion has led me to better understand the pathophysiology, comorbidities, and implications of the diagnosis. This understanding will help me communicate with others about VCD and teach about it. Knowing that something can cause such a deceasing breath, use many healthcare resources, and can be well controlled with proper guidance gives me confidence to continue my research and communicate with others who have found. It will be interesting to learn more of findings of research such as the effects of smoking on VCD.

References


Gurevich, J., Park, Y., & Deckert, D. (2013). The pathophysiology of vocal cord dysfunction is not well defined as causes are multifactorial. There are many associated causative factors to VCD, but there is no clear unifying pathophysiology (Deckert & Deckert, 2010). Inferred from the research, it seems that all of the causative factors are related to some sort of stress including physical, mechanical, technical, and psychological components. These associated factors include: exercise, psychological conditions, irritants, rhinorrhea, gastroesophageal reflux disease, psychological interaction, and medications (Deckert & Deckert, 2010). A common causative factor is exercise, often misdiagnosed as exercise induced asthma, exercise can precipitate VCD (Deckert & Deckert, 2010). Success or failure of bronchodilators can help diagnose exercise induced asthma from VCD (Deckert & Deckert, 2010). Psychological conditions like posttraumatic stress disorder, anxiety, and depression can cause PVFM as well (Deckert & Deckert, 2010). Anxiety being of high prevalence in teenage patients with vocal cord dysfunction (Deckert & Deckert, 2010). Environmental and chemical irritants are known to cause symptoms of VCD as well. Studies have shown an increased onset of symptoms with time of exposure to irritants like ammonia, motor oil, exhaust fumes, and cleaning chemicals (Deckert & Deckert, 2010). There is a high prevalence of rhinorrhea in patients with vocal cord dysfunction (Deckert & Deckert, 2010). Postnasal drip associated with rhinitis is linked to airway hyperresponsiveness and another possible contributor to VCD (Deckert & Deckert, 2010). Endotracheal intubation has been directly related to the pathogenesis of vocal cord dysfunction. In one study an endotracheal tube caused neurological injury to the recurrent laryngeal nerve and resulted in dysphonia and VCD (Kupper, Callaghan, and Hogphin, 2014). Gastroesophageal reflux disease has been associated with high prevalence in vocal cord dysfunction (Deckert & Deckert, 2010). Neurological drugs such as benzodiazepines (Companis, Fumeroen, can cause transient VCD as well (Deckert & Deckert, 2010).