Summer 7-28-2016

Pneumothorax Resulting from Costal Osteochondroma

Erin L. Jeffrey
Otterbein University, erin.jeffrey@otterbein.edu

Follow this and additional works at: https://digitalcommons.otterbein.edu/stu_msn

Part of the Nursing Commons

Recommended Citation
Jeffrey, Erin L., "Pneumothorax Resulting from Costal Osteochondroma" (2016). Master of Science in Nursing (MSN) Student Scholarship. 192.
https://digitalcommons.otterbein.edu/stu_msn/192

This Project is brought to you for free and open access by the Student Research & Creative Work at Digital Commons @ Otterbein. It has been accepted for inclusion in Master of Science in Nursing (MSN) Student Scholarship by an authorized administrator of Digital Commons @ Otterbein. For more information, please contact shickey@otterbein.edu.
Pneumothorax Resulting from Costal Osteochondroma
Erin Jeffrey, R.N., B.A.
Otterbein University, Westerville, Ohio

Introduction

Pneumothorax is considered an urgent medical situation that should be treated quickly (Zarogoulidis et al., 2014). It is defined as the presence of air in the pleural space (Figure 1). In large pneumothoraces, breath sounds may be diminished or absent, and hypotension, tachycardia, and cyanosis can occur (Noppen, 2013). Costal exostoses are categorized as spontaneous or hereditary anomalies (Zarogoulidis et al., 2010). A few cases have been studied in which a pneumothorax was caused by costal exostoses or osteochondroma.

Case Study

A 16-year-old male reported to the hospital with complaints of right-sided pleuritic chest pain with no recent history of trauma. His medical history included a diagnosis of multiple exostoses. This diagnosis also was present in several immediate family members.

A chest x-ray showed a right costal exostosis accompanied by a mass from the seventh to the eighth ribs. Further examination by computed tomography (CT) indicated that the lesion was in the same ribs with a bony spur pointing inward toward the lung cavity.

Costal osteochondroma/exostoses

Asymptomatic, but life threatening

Costal osteochondroma, also known as exostoses, can be solitary or multiple. This type of lesion can occur in adults or children.

In addition, hereditary multiple exostoses (HME) can cause abnormal bone growth with resulting skeletal abnormalities in bones that have cartilage-rich tissues (Figure 2). HME is an autosomal-dominant disorder with an EXT family gene mutation. Early diagnosis and treatment are important as well as follow up of patients with HME (Zarogoulidis et al., 2010; Vemula & Assefa, 2012; Vemula et al., 2012).

Figure 2: CT of chest without contrast showing lesions on posterior aspect of 5th rib (white arrow), and pneumothorax (curved white arrow). (Vemula, Shah & Willems, 2012)

Underlying Pathophysiology

Osteochondroma/exostoses

Normal Chest Wall Physiology

In normal physiology, the plural membrane is present on each side of the thoracic cavity that covers the lung and chest wall surfaces. Between the two layers is lubricating serous fluid. This type of lesion can occur in adults or children.

In addition, hereditary multiple exostoses (HME) can cause abnormal bone growth with resulting skeletal abnormalities in bones that have cartilage-rich tissues (Figure 2). HME is an autosomal-dominant disorder with an EXT family gene mutation. Early diagnosis and treatment are important as well as follow up of patients with HME (Zarogoulidis et al., 2010; Vemula et al., 2012).

Figure 3: Images depicting patients with EXT mutations and resulting exostoses; noted by the white arrows. (Asen, 2013)

Signs of Pneumothorax

Pneumothorax

Exostoses can cause trauma/thoracic pneumothorax through perforation, laceration, or friction from chest wall movement during breathing (Kameda et al., 2016; Imai et al., 2014). The consequent change in intrapleural pressure and possible lung collapse in an anatomic situation (ENA, 2014) that the advanced practice nurse should diagnose and treat quickly.

Figure 1: Diagram depicting physiologic mechanisms of pneumothorax. (Brigham and Women’s Hospital, 2016)

Signs and Symptoms

Costal osteochondroma/exostoses

• Exostosis to adjacent anatomical region (Marlowe, 2011).

Pneumothorax can also mechanically interfere with the lung and pleura causing pneumothorax (Assefa et al., 2011; Imai et al., 2014). These physiologic mechanisms categorize the pneumothorax as traumatic (Zarogoulidis et al., 2014).

References


Conclusions

Osteochondroma are the most common neoplasm of the bone. Twenty percent of these tumors grow in the eighth ribs. Costal exostoses are more common especially in boys and girls. The medical team should be notified early to decrease complications such as pneumothorax.

Pneumothorax can cause traumatic/thoracic pneumothorax through perforation, laceration, or friction from chest wall movement during breathing (Kameda et al., 2016; Imai et al., 2014). The consequent change in intrapleural pressure and possible lung collapse in an anatomic situation (ENA, 2014) that the advanced practice nurse should diagnose and treat quickly.

References


Conclusion

Osteochondroma are the most common neoplasm of the bone. Twenty percent of these tumors grow in the eighth ribs. Costal exostoses are more common especially in boys and girls. The medical team should be notified early to decrease complications such as pneumothorax.

Pneumothorax can cause traumatic/thoracic pneumothorax through perforation, laceration, or friction from chest wall movement during breathing (Kameda et al., 2016; Imai et al., 2014). The consequent change in intrapleural pressure and possible lung collapse in an anatomic situation (ENA, 2014) that the advanced practice nurse should diagnose and treat quickly.

References


Implications for Nursing Care

The majority of patients presenting with costal osteochondroma are asymptomatic, and the tumors are usually noted incidentally on chest radiographs (Vemula et al., 2012; Assen et al., 2011). However, in patients with HME, costal exostoses are more common and should be monitored (Assefa et al., 2011; Imai et al., 2014). The consequent change in intrapleural pressure and possible lung collapse in an anatomic situation (ENA, 2014) that the advanced practice nurse should diagnose and treat quickly.

References

