



PEDIATRIC SURGERY Update ©

Vol. 51 No. 03 SEPTEMBER 2018

Traumatic Pneumatocele

A pneumatocele is defined as a thin-walled air-filled cyst of the lung most often seen in children after bacterial pneumonia. Traumatic pneumatocele, also referred as traumatic pulmonary pseudocyst or lung cyst, is a rare complication occurring 4% of the time after blunt chest trauma (mostly car accidents). Traumatic pneumatocele can also arise from continuous positive airway pressure mechanical ventilation. Represent air-filled lesions within the pulmonary parenchyma after laceration and recoil of the affected chest cage. It represents a greater transmission of energy to the lung and a more severe injury than pulmonary contusion by itself. Traumatic pneumatoceles occurs more commonly in children and young adults due to the pliability of the pediatric rib cage and relative increased fragility of the lung parenchyma. The condition is radiologically characterized by the appearance of pulmonary cavities with no epithelial lining filled with air, fluid or blood. Pneumothorax or pneumomediastinum might also coexist. Only 20% of associated patients have rib fractures. Any number of pneumatoceles can exist at any location except the apices of the lung. Though they are appreciated in simple chest films, CT-Scan is more accurate and sensitive in detecting them. The formed cavities filled with fluid, blood or air continues to increase in size until a balance of lung pressures is achieved between the cavities and the surrounding tissue. Pneumatoceles can be single, multiple, uniloculate or multiloculated, elliptical or spherical cavities. Symptoms include chest pain, dyspnea, cough, tinges of blood in sputum, mild fever or leukocytosis 12 to 36 hours after trauma. Fever and leukocytosis results from absorption of damaged lung tissue or blood clot and not from infection. Management of traumatic pneumatoceles is conservative as observation is what is required. They usually require several weeks to months to resolve in time. Prophylactic antibiotics usage is controversial. Surgical management is needed with large pneumatoceles associated with life-threatening hemoptysis, persistent infections, hematocele and respiratory compromise.

References:

- 1- Yang TC, Huang CH, Yu JW, Hsieh FC, Huang YF: Traumatic pneumatocele. *Pediatr Neonatol.* 51(2):135-8, 2010
- 2- Cheung NK, James A, Kumar R: Large traumatic pneumatocele in a 2-year-old child. *Case Rep Pediatr.* 2013;2013:940189. doi: 10.1155/2013/940189. Epub 2013 Sep 25.
- 3- Matuszczak E, Oksiuta M, Hermanowicz A, Debek W: Traumatic pneumatocele in an 11-year-old boy - report of a rare case and review of the literature. *Kardiochir Torakochirurgia Pol.* 2017 Mar;14(1):59-62. doi:10.5114/kitp.2017.66934. Epub 2017 Mar 31.
- 4- Armstrong LB, Mooney DP: Pneumatoceles in pediatric blunt trauma: Common and benign. *J Pediatr Surg.* 53(7):1310-1312, 2018
- 5- Schimpl G, Schneider U: Traumatic pneumatoceles in an infant: case report and review of the literature. *Eur J Pediatr Surg.* 6(2):104-6, 1996

6- Van Hoorebeke E(1), Jorens PG, Wojciechowski M, Salgado R, Desager K, Van Schil P, Ramet J: An unusual case of traumatic pneumatocele in a nine-year-old girl: a bronchial tear with clear bronchial laceration. *Pediatr Pulmonol.* 44(8):826-8, 2009

Secondary Malignancy

The cure for children cancer has improved during the past decades with five-year survival rates approaching 80%. As the numbers in survival improves there is increased awareness of the risk of developing a secondary malignancy due to therapy. Subsequent malignant neoplasms are the most common non-relapse cause of late mortality accounting for almost half of all non-relapse deaths among five-year survivors. Radiotherapy has been strongly associated with development of secondary malignancy, and dose-response relationship has also been identified for specific chemotherapeutic agents including alkylating and epipodophyllotoxins agents. Hodgkin lymphoma survivors are at particular high-risk for subsequent secondary malignancies with an almost one-third cases in this group of survivors. Secondary malignancy of the breast and gastrointestinal tract most commonly follows a primary diagnosis of Hodgkin lymphoma (HL). Female breast cancer accounts for almost 20% of subsequent malignant neoplasms of most cohort groups studied. Second thyroid cancers are most common in leukemia and HL survivors as were skin melanomas. The thyroid gland is highly susceptible to the carcinogenic effects of ionizing radiation. Secondary sarcomas with 15% incidence predominantly occur among survivors of primary soft tissue sarcoma or HL and the risk is associated to exposure to anthracyclines, alkylating agents and radiation therapy. Secondary hematopoietic cancers most commonly follow a primary diagnosis of HL or leukemia. Second malignancy of the central nervous system (CNS) with an almost 10% incidence most commonly occurs after an original diagnosis of a CNS tumor or leukemia. There is a linear relation between radiation doses received during treatment for childhood cancer and the relative risk of subsequent gliomas or meningiomas. Non-melanoma skin cancer (basal cell and squamous cell) is another secondary malignancy rarely fatal occurring with an increase incidence in survivors of HL, leukemia and CNS tumors related to radiation therapy exposure. Females are at increased risk for breast, thyroid, non-melanoma skin and meningiomas. The period of higher risk for secondary malignancy occurs before age of 40 years.

References:

- 1- Meadows AT, Friedman DL, Neglia JP, et al: Second neoplasms in survivors of childhood cancer: findings from the Childhood Cancer Survivor Study cohort. *J Clin Oncol.* 27(14):2356-62, 2009
- 2- Friedman DL, Whitton J, Leisenring W, et al: Subsequent neoplasms in 5-year survivors of childhood cancer: the Childhood Cancer Survivor Study. *J Natl Cancer Inst.* 102(14):1083-95, 2010
- 3- Turcotte LM, Whitton JA, Friedman DL, et al: Risk of Subsequent Neoplasms During the Fifth and Sixth Decades of Life in the Childhood Cancer Survivor Study Cohort. *J Clin Oncol.* 33(31):3568-75, 2015
- 4- MacArthur AC, Spinelli JJ, Rogers PC, Goddard KJ, Phillips N, McBride ML: Risk of a second malignant neoplasm among 5-year survivors of cancer in childhood and adolescence in British Columbia, Canada. *Pediatr Blood Cancer.* 48(4):453-9, 2007
- 5- Reulen RC, Frobisher C, Winter DL, et al; British Childhood Cancer Survivor Study Steering Group: Long-term risks of subsequent primary neoplasms among survivors of childhood cancer. *JAMA.*

305(22):2311-9, 2011

6- Turcotte LM, Liu Q, Yasui Y, et al: Temporal Trends in Treatment and Subsequent Neoplasm Risk Among 5-Year Survivors of Childhood Cancer, 1970-2015. *JAMA*. 317(8):814-824, 2017

Opioid Abuse

Opioid overdose has become an epidemic and significant health problem in the United States taking the life of thousands of adolescents per year. Prescribed opioids and mostly synthetic opioids are involved in almost two-third of all types of drug overdose with 42,249 deaths in 2016. Opioid overdose began in the 1990's with prescribed opioids, then it changed in 2010 characterized by heroin deaths. Now potent synthetic opioids mainly involved in the last wave of 2013 include illicitly manufactured fentanyl and fentanyl analogs. Opioid poisoning in children one to four years of age has increased 200% between 1997 and 2012. Opioid abuse in adolescent causes problems in continuous appropriate acute pain management. Children who abuse opioids and are in household where parents struggle with substance abuse are more likely to experience neglect and nonaccidental trauma. Availability of FDA approved opioid medications, pharmaceutical companies marketing campaigns and inadequate education or knowledge about the risk of prescribing opioids from managing chronic noncancer pain has contributed to the increased in prescribed opioids. There has also been a substantial increase in the risk of hospital readmissions in the first years of life among children with neonatal abstinence syndrome and documented exposure to maternal opioids. Physicians must prescribe opioids more cautiously for acute and chronic pain. They should also use nonopioid substitutes analgesics and non-pharmaceutical approach more often. Patient education should include the risk of using prescribed opioids. By decreasing the quantity of prescribed opioids and discarding or returning unused medication less nonmedical use will occur. Easy access to medical treatment programs using buprenorphine, naltrexone and methadone should be encouraged.

References:

- 1- Seth P, Scholl L, Rudd RA, Bacon S: Overdose Deaths Involving Opioids, Cocaine, and Psychostimulants - United States, 2015-2016. *MMWR Morb Mortal Wkly Rep*. 67(12):349-358, 2018
- 2- Wu LT, Ghitza UE, Burns AL, Mannelli P: The opioid overdose epidemic: opportunities for pharmacists. *Subst Abuse Rehabil*. 8:53-55, 2017
- 3- Witt CE, Rudd KE, Bhatraju P, Rivara FP, Hawes SE, Weiss NS: Neonatal abstinence syndrome and early childhood morbidity and mortality in Washington state: a retrospective cohort study. *J Perinatol*. 37(10):1124-1129, 2017
- 4- Groenewald CB et al: Trends in opioid prescription among children and adolescents in the United States: a nationally representative study from 1996 to 2012. *Pain* 157: 1021, 2016
- 5- Austin AE, Shanahan ME, Zvara BJ: Association of childhood abuse and prescription opioids use in early adulthood. *Addict Behav* 76: 265, 2018
- 6- Allareddy V, Rampa S, Allareddy V: Opioid abuse in children: an emerging public health crisis in the United States! *Pediatr Res*. 82(4):562-563, 2017

***Edited by: Humberto Lugo-Vicente, MD, FACS, FAAP**

**Professor of Pediatric Surgery, University of Puerto Rico - School of Medicine,
Rio Piedras, Puerto Rico. Director - Pediatric Surgery, San Jorge Childrens
Hospital.**

**Address: P.O. Box 10426, Caparra Heights Station, San Juan, Puerto Rico USA
00922-0426.**

Tel (787)-999-9450 E-mail: *titolugo@coqui.net*

Internet: <http://home.coqui.net/titolugo>

**©PSU 1993-2018
ISSN 1089-7739**