A case of pericardial effusion as a complication of the Nuss procedure due to nickel allergy
Janet Zhu D.O., Jessica Hiruma M.D., Karen Flotildes D.O.

BACKGROUND
- Allergic reactions to the metal bars used in the Nuss procedure occur in less than 3% of patients
- Development of a pericardial effusion after Nuss bar placement occurs in less than 1.5%

CASE DESCRIPTION
- April 2015: 13 y/o F w/ severe pectus excavatum presents for surgical consultation at CHLA
- PMH: mild eczema; no documented allergies
- July 2015: Nuss bar placed, discharged w/o complications
- Two post-op clinic visits unremarkable
- October 2015: presents w/ fever, dyspnea, and chest pain
- Surgical incisions were erythematous and tender

HOSPITAL COURSE
- Pt with increasing fatigue, persistent tachycardia, admitted to ICU
- HD #1: TTE & CXR & CT: large pericardial effusion w/o evidence of tamponade, pleural effusions (Fig 1 & 2)
- OR for pericardiocentesis → 350cc of fluid drained, cx + for Staph Lugdunesis, blood cx negative
- HD #3: chest tubes placed for b/l pleural effusions
- Nickel allergy testing is positive
- HD #7: Nuss bar removed w/ improvement of chest pain
- Eosinophil count dropped post bar removal (1.5% → 5% → 1.6%)
- HD #15: Discharged w/ follow up Feb 2016

DISCUSSION
- Allergic contact dermatitis (ACD) from nickel is the most common form of metal hypersensitivity
- Prevalence of nickel sensitivity in the general population ranges from 4-19%
- ACD: type IV delayed hypersensitivity mediated by allergen-specific T cells in the skin
- Medically implanted devices may release metal ions into systemic circulation (Table 2)
- Symptoms of allergy after bar placement are commonly seen as rash, pleural effusion, and granuloma (Table 1)
- Rare late complications include pericarditis or pericardial effusion
- Serositis related to metal hypersensitivity was the most probable explanation for our patient’s pleural effusions and pericardial effusion.

LEARNING OBJECTIVES
- Patients with a history of atopy (rhinitis, eczema, asthma) or metal allergy should have metal allergy testing prior to surgery
- If testing is positive, a titanium bar should be used
- Recent studies have shown that extra-pleura Nuss procedures have fewer complications than the classical procedure

REFERENCES