Acquired Thoracic Scoliosis Following Nuss Procedure for Pectus Excavatum
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Introduction: Minimally invasive repair of pectus excavatum (Nuss procedure) is increasingly gaining acceptance as an effective method of repair of pectus excavatum, a common chest wall deformity in pediatric population. This less radical procedure provides good cosmetic results, earlier return to full activity, shorter hospital stays, shorter operating times, minimal blood loss and fewer complications compared to traditional Ravitch’s open technique. Complications associated with this procedure has been further reduced by many surgical modifications including thoracoscopy assisted placement of a retrosternal pectus bar.¹ Acquired thoracic scoliosis is a rare and potential correctable complication of the Nuss procedure² which has not been reported in anesthesia and pain literature. In this report we describe a case of acquired thoracic scoliosis following Nuss procedure and its management.

Case Report: A 13 year old otherwise healthy boy with a severe pectus excavatum defect with moderate exercise limitation and restrictive pulmonary function test presented for Nuss repair of the defect. After induction of endotracheal anesthesia, a thoracic epidural catheter was placed at T7 level to provide intraoperative and postoperative analgesia. Under thoracoscopic guidance, a pectus bar was placed and flipped to hug the chest wall. A good correction of the excavatum was achieved and an immediate postoperative chest X-ray (Figure 1) confirmed optimum correction and ruled out pneumothorax. Patient was extubated in the operating room and transferred to recovery room. He had adequate pain relief with patient controlled epidural analgesia with a combination of bupivacaine (1 mcg/ml) and clonidine (1 mcg/ml). On postoperative day (POD) # 2 he had moderate chest wall pain and mild lateral curvature of his upper back, which improved with a 10 cc epidural bolus of 1% lidocaine. On POD # 3, the epidural catheter was removed and intravenous patient controlled analgesia (PCA) with morphine was started. On POD #4, the patient had moderate to severe pain and curvature in his upper back, which did not get better with additional dose of intravenous morphine. A chest X-ray (Figure 2) obtained at that time showed a moderate thoracic scoliosis. Small doses of intravenous diazepam helped to improve paraspinal muscle spasm and thoracic scoliosis. The patient was discharged home with residual scoliosis on oral diazepam and advised physical therapy. During his follow up 2 weeks post repair his thoracic scoliosis almost disappeared.

Discussion: Acute complications of the Nuss procedure include pneumothorax, hemothorax, atelectasis, and infection. Late complications include slipped retrosternal bar, chest wall restriction, empyema and pericarditis. Other life threatening complications such as cardiac perforation and thoracic outlet syndrome are rare. This is the first report of acquired thoracic scoliosis following the Nuss procedure in anesthesia literature. Asymmetric paraspinal muscle spasm and chest wall imbalance may be associated with this acquired scoliosis following pectus excavatum repair with placement of pectus strut, which often displaces unresected abnormal cartilages anteriorly. Patients should be evaluated for pre-existing thoracic scoliosis, which is seen preoperatively in some patients. The iatrogenic thoracic scoliosis in our patient improved with effective epidural analgesia and paraspinal muscular relaxation with diazepam. Physiotherapy and passive range of motion exercises seem to help correcting this acquired thoracic scoliosis following the minimally invasive repair of pectus excavatum. Early identification of this correctable form of scoliosis and appropriate interventions will prevent another skeletal deformity and improve patient’s comfort and appearance.

References: